



Leicester Diabetes Centre

Committed to Growing International Research, Education & Innovation

University Hospitals of Leicester **NHS**
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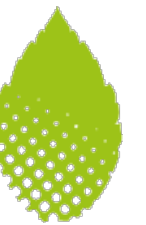


Journey of a
Slumdog Researcher

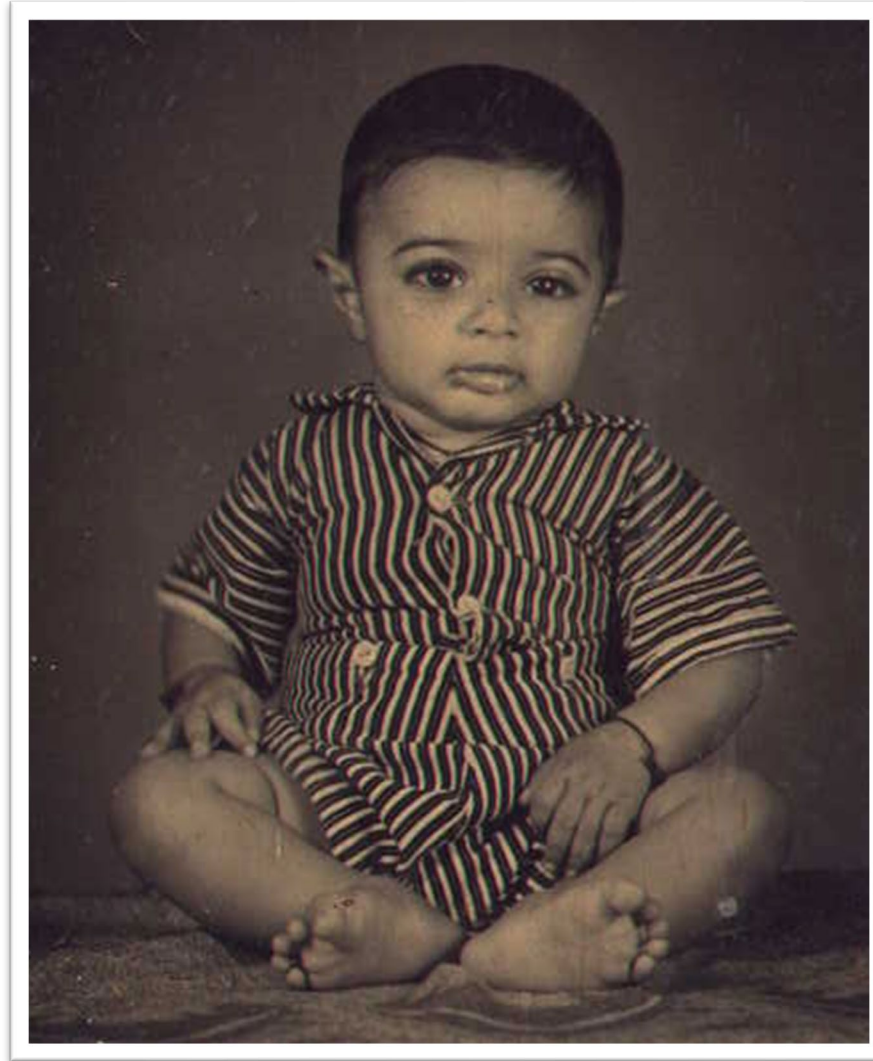
Born in the slums of Uganda



1961:
Born in slums
of Uganda



African Milk- but ? Higher risk of future risk



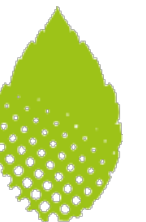
Moved to India 1979

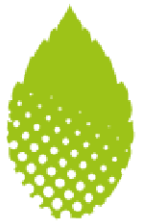
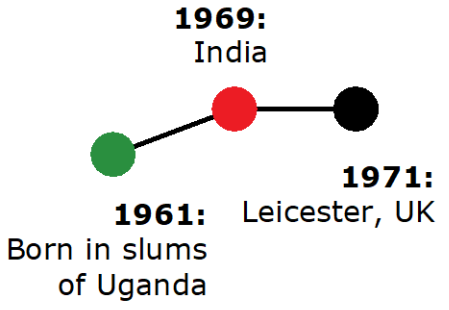


1969:
India

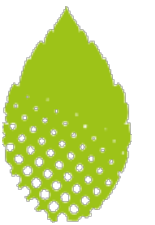


1961:
Born in slums
of Uganda

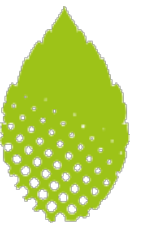




1971 Hartington Road (UK) 2 Bedroom Bed-sit

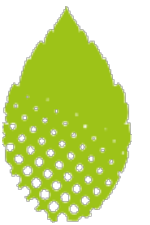


1972 Melbourne Road, Leicester 10 in 2 rooms!

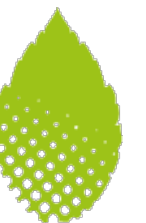


Moat Boys School, Highfields 1972-1977

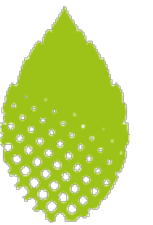
3 GCSEs & 2 CSEs

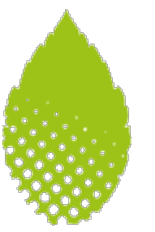
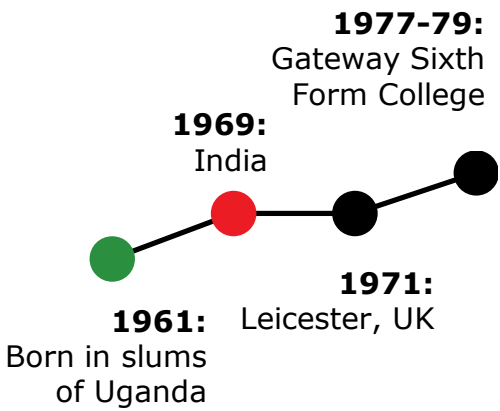


Growing up in inner City Leicester

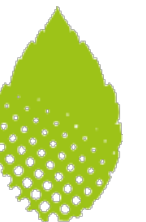


Happy Days!

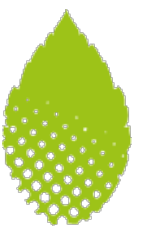
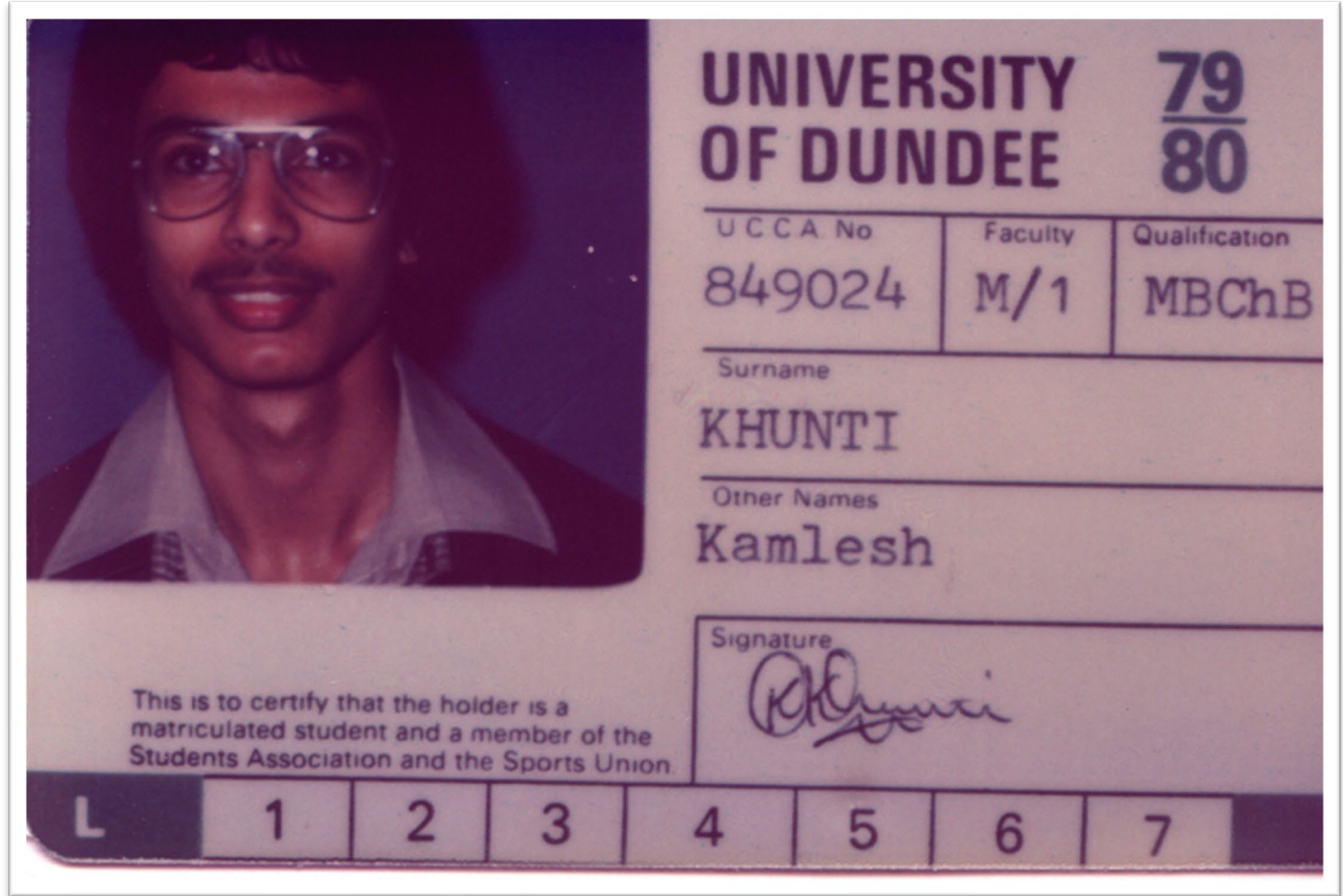
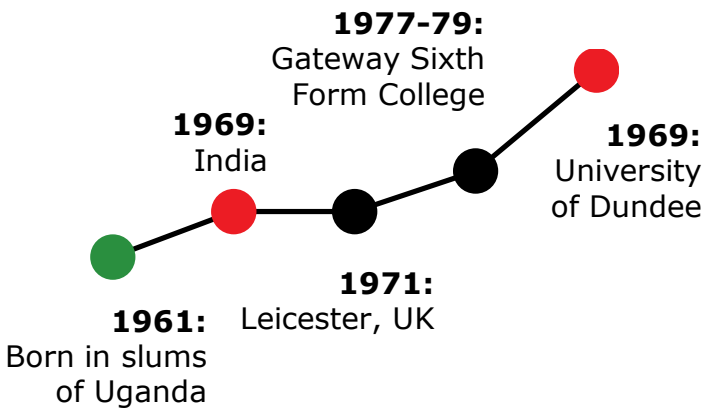




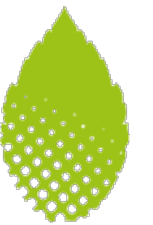
Gateway Sixth Form College 1977-79



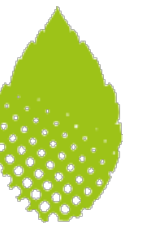
Sneaked into Dundee University with 3 GCSCs, 2 CSEs and a Gujarati GCSE!



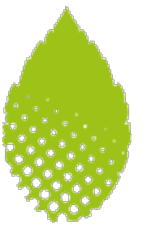
More Happy Days!



Meeting Pratima 1980



Even More Good Times!



First Publication

THE LANCET

Volume 322, Issue 8358, 5 November 1983, Pages 1054–1055

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ACCURACY OF INTRACARDIAC INJECTIONS DETERMINED BY A POST-MORTEM STUDY

H.I. Sabin, K. Khunti, S.B. Coghill, G.O. Mcneill

Departments of Pathology and Medicine, Ninewells Hospital and Medical School, Dundee, United Kingdom

[http://dx.doi.org/10.1016/S0140-6736\(83\)91040-1](http://dx.doi.org/10.1016/S0140-6736(83)91040-1), How to Cite or Link Using DOI

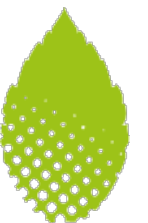
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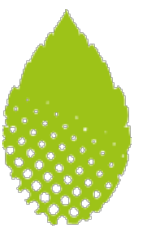
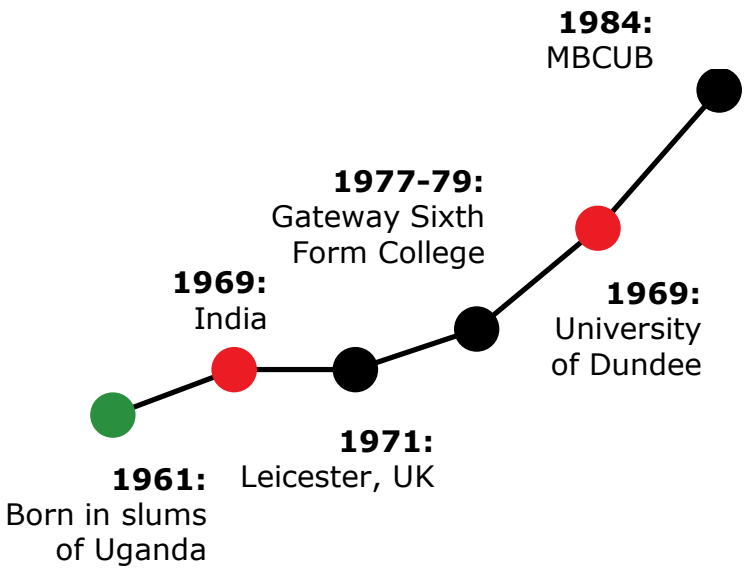
Abstract

Intracardiac injection sites were traced at necropsy on 18 patients who died after unsuccessful cardiopulmonary resuscitation. In only 13 patients (72%) was the heart punctured. Of the 46 injections carried out, 5 (11%) pierced the left ventricle and 13(28%) the right ventricle. Other structures punctured included the pulmonary trunk, the aorta, and the lung. The fourth intercostal space just lateral to the sternal edge was the commonest injection site, and only 5 injections were subxiphoid. Post-mortem injections on a further 20 cadavers confirmed that the right ventricle is the most frequent puncture site whichever approach is used.

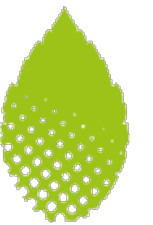
There are no figures or tables for this document.

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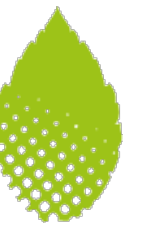


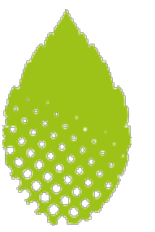
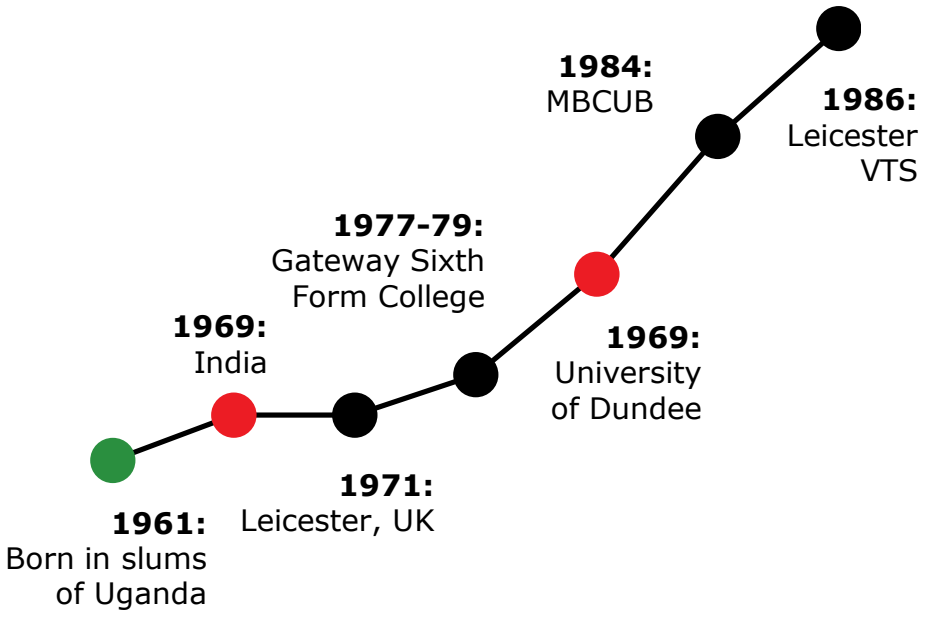


Proud parents at graduation 1984

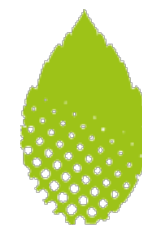


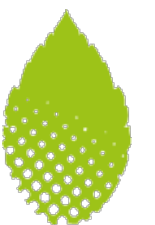
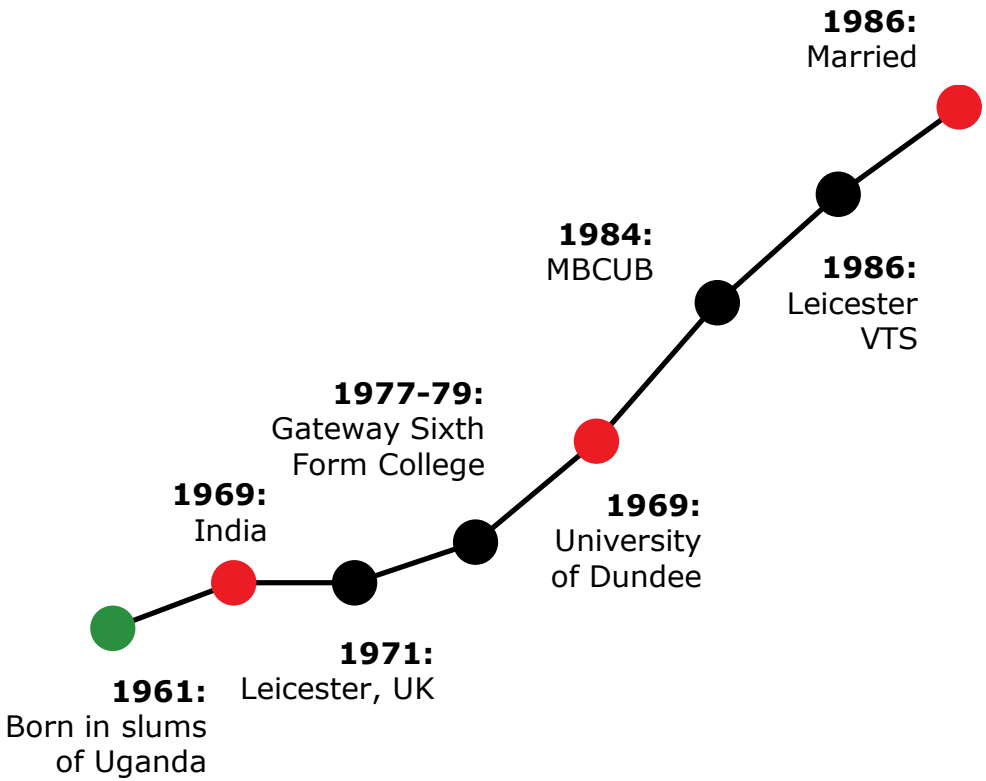
Graduation



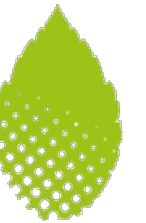


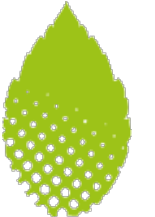
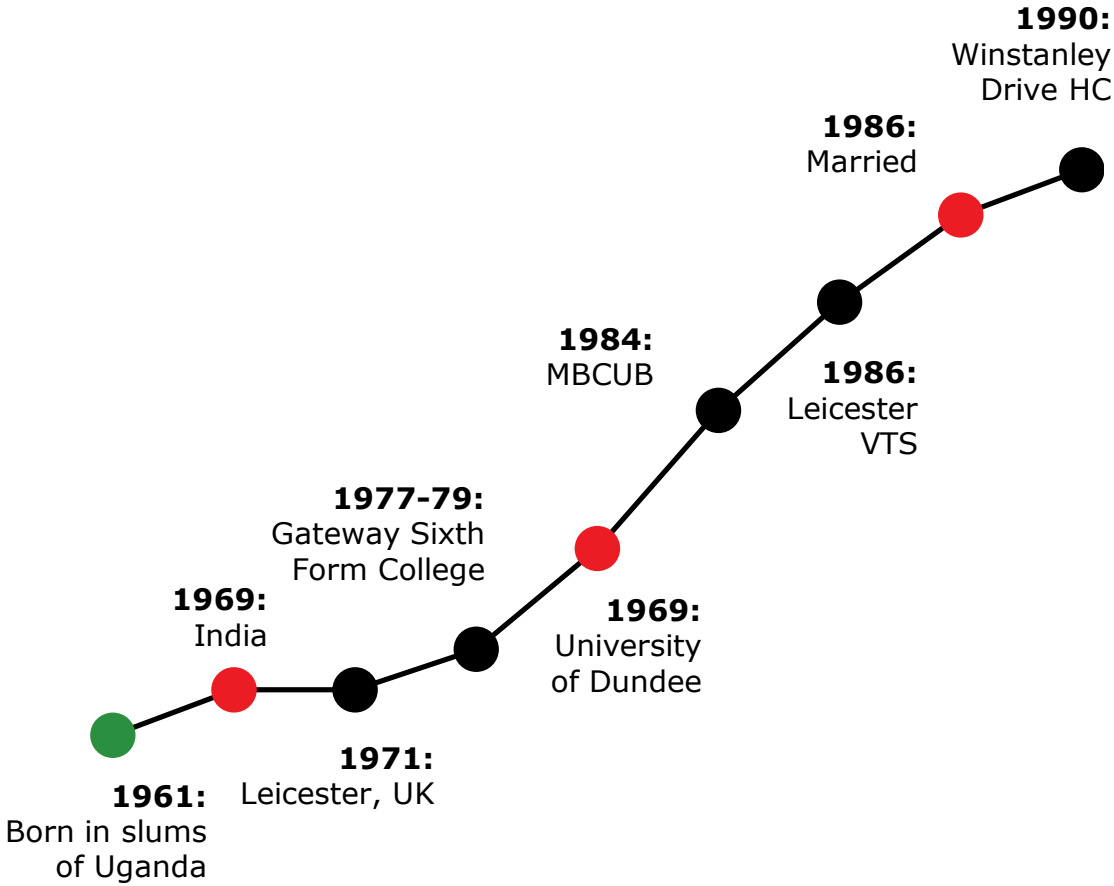
Lancaster GP Vocational Training Scheme 1986-89



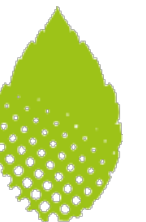


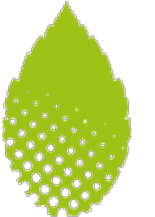
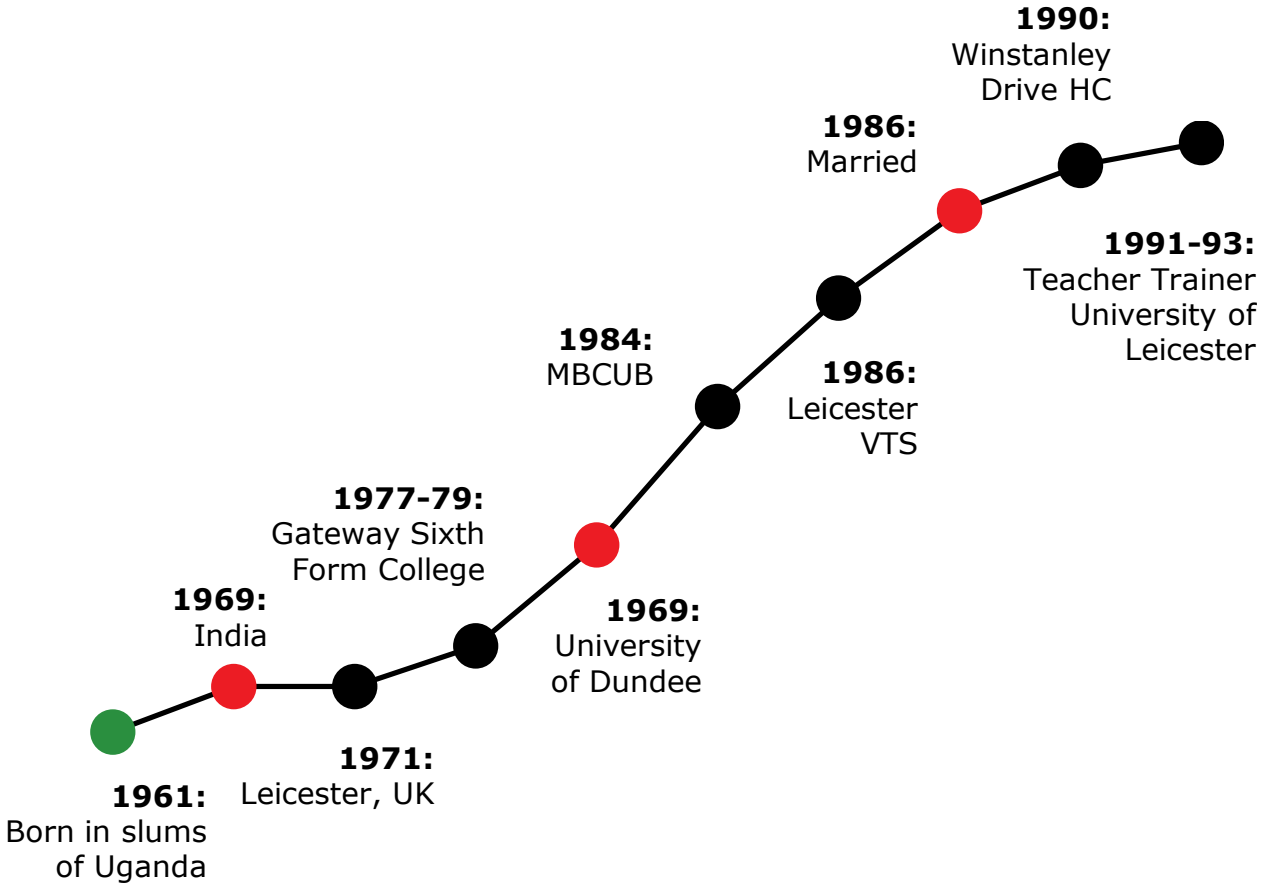
I do!! 1986





Leicester Inner City General Practice: 1990 to Present





Interest in research – small scale practice based studies

A method of creating a death register for general practice

Kamlesh Khunti

Registers of deaths, kept by general practices, are important for audit and research, to improve the care of dying patients, for planning services for terminally ill patients, and to improve the care of recently bereaved patients.^{1,2} A critical analysis of deaths in whole populations can also identify changes that are needed in the work and organisation of primary care teams.³ Although many general practitioners are interested in receiving a confidential list of deaths for their practice, only a few general practitioners maintain a death register.²

To create a death register general practitioners need accurate, up to date information about their patients' deaths. However, general practitioners complete only 30% of death certificates themselves, and, although registration of death is a statutory obligation, they have considerable difficulty obtaining prompt and accurate information about their other patients who die.^{1,2} The cause of death of patients who die in hospital is not always available,⁴ and coroners do not routinely provide reports to general practitioners unless they are requested. Some coroners' offices charge to supply the reports. An audit in our practice showed that the current method of maintaining the death register was inadequate. I describe a simple system introduced following this audit for an accurate death register.

Table 1—Results of audits of death register. Values are numbers (percentages) unless specified otherwise

	First audit	Second audit
Number of deaths	131	126
Crude death rate (per 1000 population)	13.6	13.1
Sex distribution:		
Men	54 (41)	49 (39)
Women	77 (59)	77 (61)
Average age in years (range)	75.7 (5-99)	77.6 (40-99)
Cause of death recorded	95 (73)	125 (99)
Referred to coroner	12 (9)	19 (15)
Died in hospital	Not known	47 (37)
Died in own home or residential or nursing home	Not known	78 (62)
Causes of death:		
Coronary artery diseases	28 (21)	47 (37)
Respiratory diseases	28 (21)	24 (19)
Neoplastic disorders	26 (20)	26 (21)
Cerebrovascular disorders	7 (5)	20 (16)
Others	10 (8)	8 (6)
Not known	32 (24)	1 (0.8)

Improving aspirin prophylaxis after myocardial infarction in primary care: collaboration in multipractice audit between primary care audit group and health authority

Kamlesh Khunti, Ross Sorrie, Siobhan Jennings, Azaar Farooqi

The Antiplatelet Trialists' Collaboration provided convincing evidence of benefits of aspirin prophylaxis in patients after myocardial infarction,¹ but many such patients do not receive it.^{2,3} Since most patients are followed up in primary care, practices need to implement methods of improving aspirin prophylaxis in these patients. The aim of this multipractice audit led by a primary care audit group was to assess and improve levels of prescribing of prophylactic aspirin for patients after myocardial infarction in Leicestershire.

Subjects, methods, and results

All Leicestershire practices (n = 154) were invited to take part and were offered six hours' postgraduate allowance for completing the full audit cycle. The health authority supplied data to the participating practices on currently registered patients who had been discharged after myocardial infarction over the past five years. These data were retrieved from the hospital information system and were checked against the list of registered patients. Patients who had died and those who had moved away were removed from the list. Practices were guaranteed anonymity on their audit results.

A retrospective record review was carried out in

Aspirin prophylaxis in patients after myocardial infarction in 45 general practices in Leicestershire

	Phase 1* (n=1264)	Phase 2 (n=1258)†	Significance
No of patients taking aspirin	957	1058	—
No (%) of patients with contraindication to aspirin	127 (10.0)	163 (13.0)	—
% of patients treated, excluding those with contraindication (95% CI)	84.2 (81.9 to 86.2)	96.6 (95.4 to 97.6)	$\chi^2=97.1$, P<0.0001

*All eligible patients were receiving aspirin in 12 practices.

†Excludes six patients who had been given incorrect diagnosis, who had died, or who had moved away.

accurate list of patients after myocardial infarction only in the past five years; all practices were self selected; and the record review was carried out by the practices. The results therefore probably overestimate the quality of care of patients after myocardial infarction.³

Participation in audit is influenced by many factors, with lack of time and skill being two of the common barriers.⁴ A time consuming and difficult part of undertaking audit is compiling a register of patients with the condition being audited. In our study the health authority made this register readily available to the practices.

The white paper *The New NHS* places great emphasis

Clinical Governance Research and Development Unit, Department of General Practice and Primary Health Care, University of Leicester, Leicester LE5 4PW
Kamlesh Khunti, clinical lecturer

Leicestershire Primary Care Audit Group, Leicester General Hospital, Leicester LE5 4PW

BMJ 1996; 312:952.

BMJ 1999; 319:297.

Brief reports

Impact of an audiology clinic in one general practice

K KHUNTI

M CARR

SUMMARY

There is a large demand for the provision of hearing aids. However, there are lengthy delays involved between referral and fitment of National Health Service (NHS) hearing aids. This report shows that a general practice based audiology clinic can lead to an increase in the number of patients referred and fitted with a hearing aid. The introduction of the clinic also led to reduced waiting times for patients to be fitted with hearing aids.

Keywords: audiology; deafness; hearing aid.

Introduction

In the United Kingdom (UK) there is a large demand for the provision of hearing aids, which is likely to increase as the population ages. However, there is a large unmet need for hearing aid provision, and simple health centres may satisfy this need. National Institute for the Deaf issues concerns about the lengthy delays involved in fitment of NHS hearing aids, with late being reported.² A subsequent report could be provided in health centres supervised by general practitioners, examined the impact of an audiology training practice situated in a health

centre identified by a computer search of all new patients with deafness who were referred during the eight-month periods from 1 April 1990 and 1 April 1991.

Results

Table 1 shows the results of this study. Fifty-three patients were referred to the audiology clinic in the eight-month study period following the introduction of the clinic. Thirty patients were subsequently referred with a new diagnosis of deafness. Half of the patients referred with deafness were fitted with a hearing aid prior to the audiology clinic (5/10); however, this increased to three-quarters of patients being fitted with a hearing aid after the introduction of the clinic (24/29). One patient did not attend for an appointment. Over half the patients (17/30) with deafness were referred directly to the hospital hearing aid clinic. All patients referred directly to the hearing aid clinic were fitted with a hearing aid.

Discussion

Postgrad Med J 2000;76:415-416

415

AUDIT

Referral for autopsies: analysis of 651 consecutive deaths in one general practice

Kamlesh Khunti

Abstract

Autopsies represent a key instrument in educating doctors and may aid quality assurance for primary and secondary care. This study shows that only a few patients have an autopsy, of which the majority are carried out at the request of the coroner for medicolegal reasons. Better education and communication between general practitioners, hospital clinicians, pathologists, and coroners may increase the rate of autopsies.

(Postgrad Med J 2000;76:415-416)

Keywords: deaths; death register; autopsy; coroner

Autopsy represents a key instrument in educating doctors, reassuring the relatives of the deceased, and may provide some indication of the quality of a patient's care.^{1,2} A major outcome of autopsies is to send information back to individual practitioners for the primary

hospital if the practice is not informed of the cause of death. A report is also requested for all patients referred to the coroner. We report on 651 consecutive deaths that occurred in the practice over a four year period from 1 April 1993 to 31 March 1997. The average list size over the four years was stable at around 9700 patients with 14.8% patients being over the age of 65 years. The cause of death was recorded for 649 (99.7%) patients. Seventy six (11.7%) patients had an autopsy; 75 autopsies were carried out at the request of the coroner for medicolegal reasons and only one non-coroner (clinical) autopsy was requested by the hospital. Table 1 shows the characteristics of patients who had a medicolegal autopsy. There was no difference in the age of patients who were referred to the coroner from the hospital or from general practice (median age 72.5 v 75.1; Mann-Whitney U 423, p = 0.38). The Bonferroni correction for the cause of death showed that cardiac causes were significantly greater than other causes of death (n<0.003).

First Paper From University

DM

Effectiveness of screening and monitoring tests for diabetic retinopathy – a systematic review

A. Hutchinson*, A. McIntosh*, J. Peters*, C. O’Keeffe*, K. Khuntit, R. Bakert and A. Booth‡

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†Department of General Practice and Primary Care, University of Leicester, Leicester, UK

Received 1 July 1999; revised 26 November 1999; accepted 29 November 1999

Abstract

Aims To determine which screening and monitoring tests for diabetic retinopathy are most effective and under what circumstances.

Methods A systematic review of the English language literature, published from 1983 to April 1999.

Results Available studies are generally limited in their ability to answer the important questions on the effectiveness of tests for early detection of diabetic retinopathy. No randomized controlled trials were identified although primary studies exist for two screening tests: ophthalmoscopy, either direct or indirect, and retinal photography, using either mydriasis or non-mydriasis. Retinal photography under mydriasis appears to be the most effective test, with the majority reporting levels of sensitivity in excess of 80%. However effectiveness is compromised when photographs are ungradable. Ophthalmoscopy can also reach acceptable standards of sensitivity and specificity.

Conclusion Based on an assessment of available cohort studies, the most effective strategy for testing is the use of mydriatic retinal photography with the additional use of ophthalmoscopy for cases where photographs are ungradable. This does not exclude the use of ophthalmoscopy alone for opportunistic case finding but there is evidence of considerable variation in effectiveness of this test.



De-intensification of medications

Age and Ageing 2000; **29**: 451–453

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SHORT REPORT

Effect of systematic review of medication by general practitioner on drug consumption among nursing-home residents

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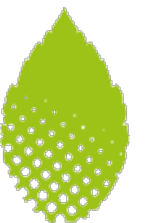
Abstract

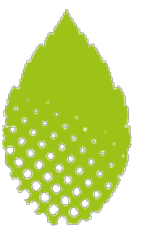
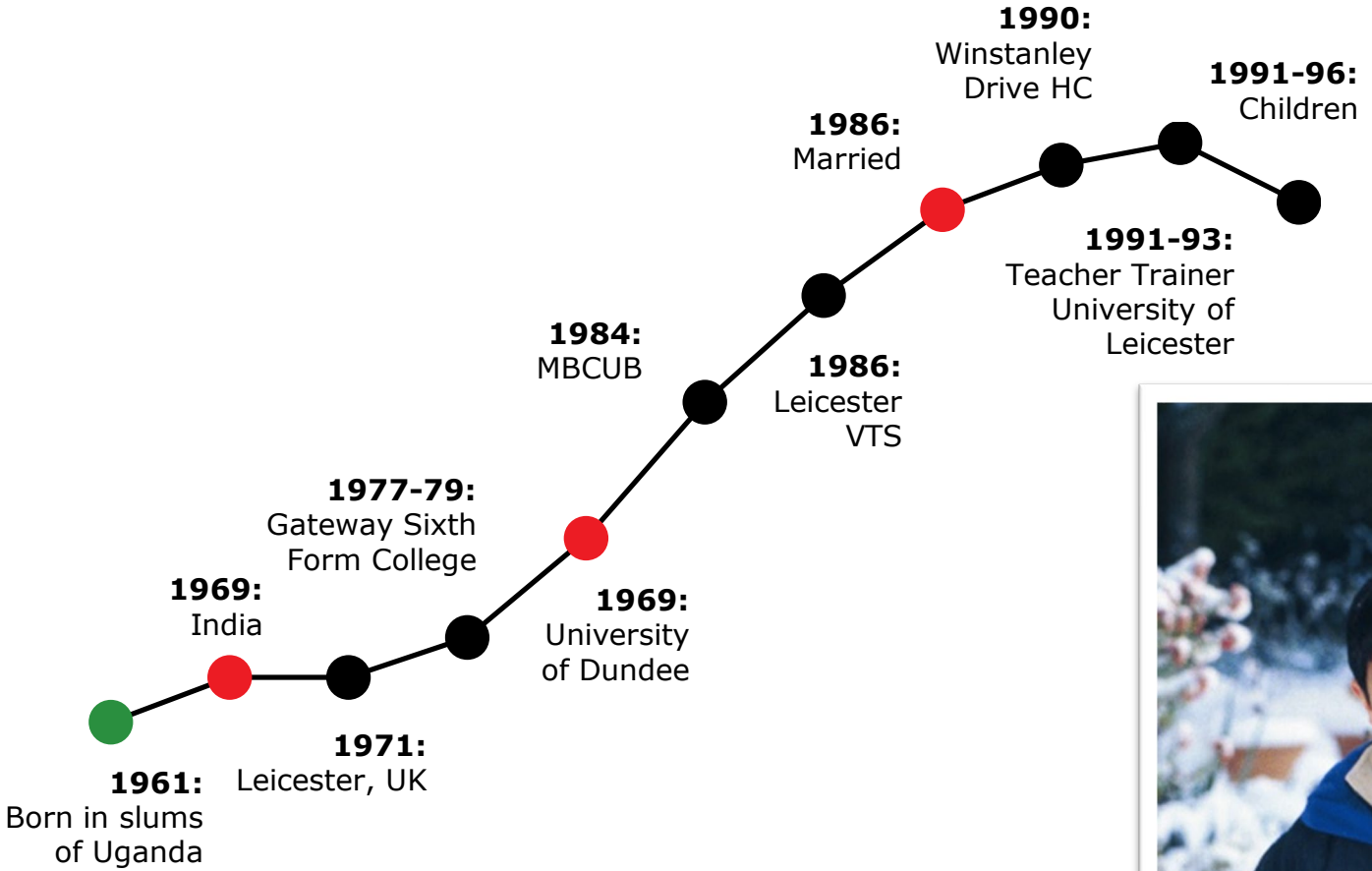
Background: nursing-home patients usually have many medical problems and often take many drugs. They are therefore at risk from drug side effects and interactions.

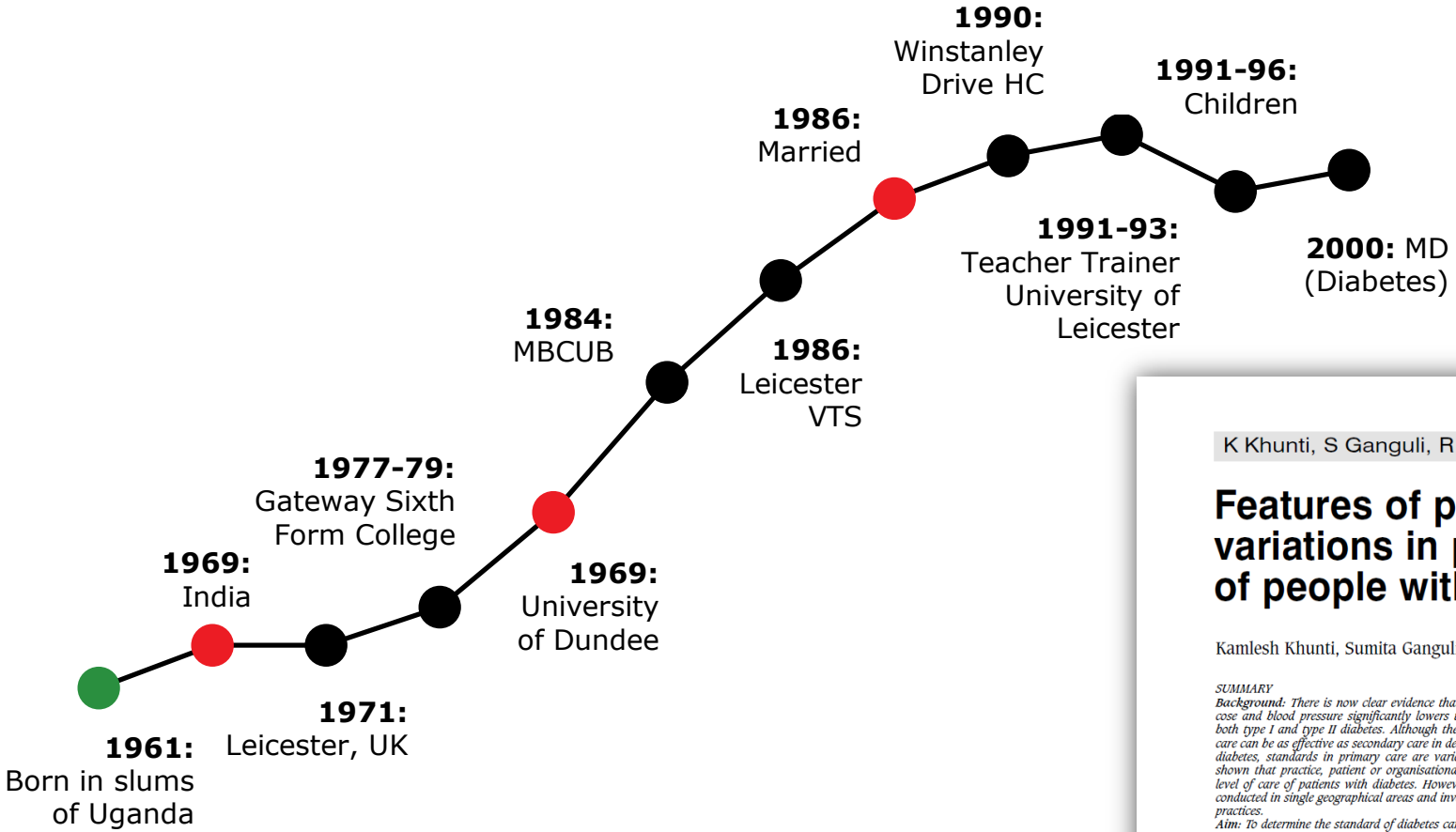
Aims: to evaluate the impact of a visit by a general practitioner and a comprehensive repeat prescribing review on the consumption of inappropriate drugs in nursing homes.

Method: two general practitioners made one comprehensive visit to four randomly selected nursing homes. In each home we discussed all patients in detail with a senior member of staff. We reviewed the prescribing record of each patient and stopped items if we considered them inappropriately prescribed or unnecessary.

Results: repeat prescriptions were altered in 65% of patients: 51% had an item stopped and 26% had an item







K Khunti, S Ganguli, R Baker and A Lowy

Features of primary care associated with variations in process and outcome of care of people with diabetes

Kamlesh Khunti, Sumita Ganguli, Richard Baker and Adam Lowy

SUMMARY

Background: There is now clear evidence that tight control of blood glucose and blood pressure significantly lowers the risk of complications in both type 1 and type 2 diabetes. Although there is evidence that primary care can be as effective as secondary care in delivering care for people with diabetes, standards in primary care are variable. Previous studies have shown that practice, patient or organisational factors may influence the level of care of patients with diabetes. However, these studies have been conducted in single geographical areas and involved only small numbers of practices.

Aim: To determine the standard of diabetes care in general practice and to determine which features of practices are associated with delivering good quality care.

Design of study: A questionnaire survey and analysis of multi-practice audit data.

Setting: Three health authorities in England, comprising 169 general practices.

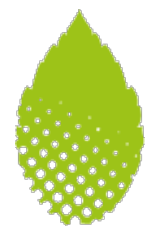
Method: This study was conducted with a total population of 1 182 872 patients and 18 642 people with diabetes. Linkage analysis was carried out on data collected by a questionnaire, routinely collected health authority data, and multi-practice audit data collected by primary care audit groups. Practice annual compliance was measured with process and outcome measures of care, including the proportion of patients who had an examination of their fundi, feet, blood pressure, urine, glycated haemoglobin, and the proportion who had a normal glycated haemoglobin.

Results: Median compliance with process and outcome measures of care varied widely between practices: fundi were checked for 64.6% of patients (interquartile range [IQR] = 45.3-77.8%), urine was checked for 71.4% (IQR = 49.7-84.3%), feet were checked for 70.4% (IQR = 51.0-84.4%), blood pressure for 83.6% (IQR = 66.7-91.5%), and glycated haemoglobin was checked for 83.0% of patients (IQR = 69.4-92.0%). The glycated haemoglobin was normal in 42.9% of patients (IQR = 35.0-51.2%). In

Introduction

THERE is now clear evidence that tight control of blood glucose significantly lowers the risk of microvascular complications in both type 1¹ and type 2 diabetes.² Tight blood pressure control also reduces the risk of macrovascular complications in type 2 diabetes.^{3,4} Although there is evidence that primary care can be as effective as secondary care in delivering care for people with diabetes,⁵ standards in primary care are variable. At the same time, there has been an increase in the proportion of patients being reviewed solely in primary care⁶ and therefore methods are needed for reducing the variability in these standards. The NHS Executive has issued a guideline against which health authorities can assess the quality of service provided locally⁷ and many general practices have taken part in audit of diabetes care. Audit of diabetes care has been common in general practice because this has been a requirement since the introduction of the chronic disease management programme.⁸ Consequently, diabetes has been the commonest topic of multi-practice audit since 1991.⁹

Audits have confirmed wide variations in care of patients with diabetes between practices¹⁰ and between different health districts.¹¹ Previous studies have shown that practice,



First RCT

Randomised controlled trial of near-patient testing for glycated haemoglobin in people with type 2 diabetes mellitus

Kamlesh Khunti, Margaret A Stone, Andrew C Burden, David Turner, Neil T Raymond, Mary Burden and Richard Baker

ABSTRACT

Background

Tight glycaemic control in people with type 2 diabetes can lead to a reduction in microvascular and possibly macrovascular complications. The use of near-patient (rapid) testing offers a potential method to improve glycaemic control.

Aim

To assess the effect and costs of rapid testing for glycated haemoglobin (HbA1c) in people with type 2 diabetes.

Design of study

Pragmatic open randomised controlled trial.

Setting

Eight practices in Leicestershire, UK.

Method

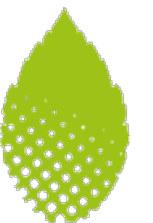
Patients were randomised to receive instant results for HbA1c or to routine care. The principal outcome measure was the proportion of patients with an HbA1c <7% at 12 months. We also assessed costs for the two groups.

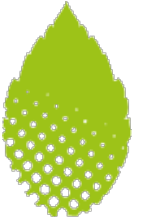
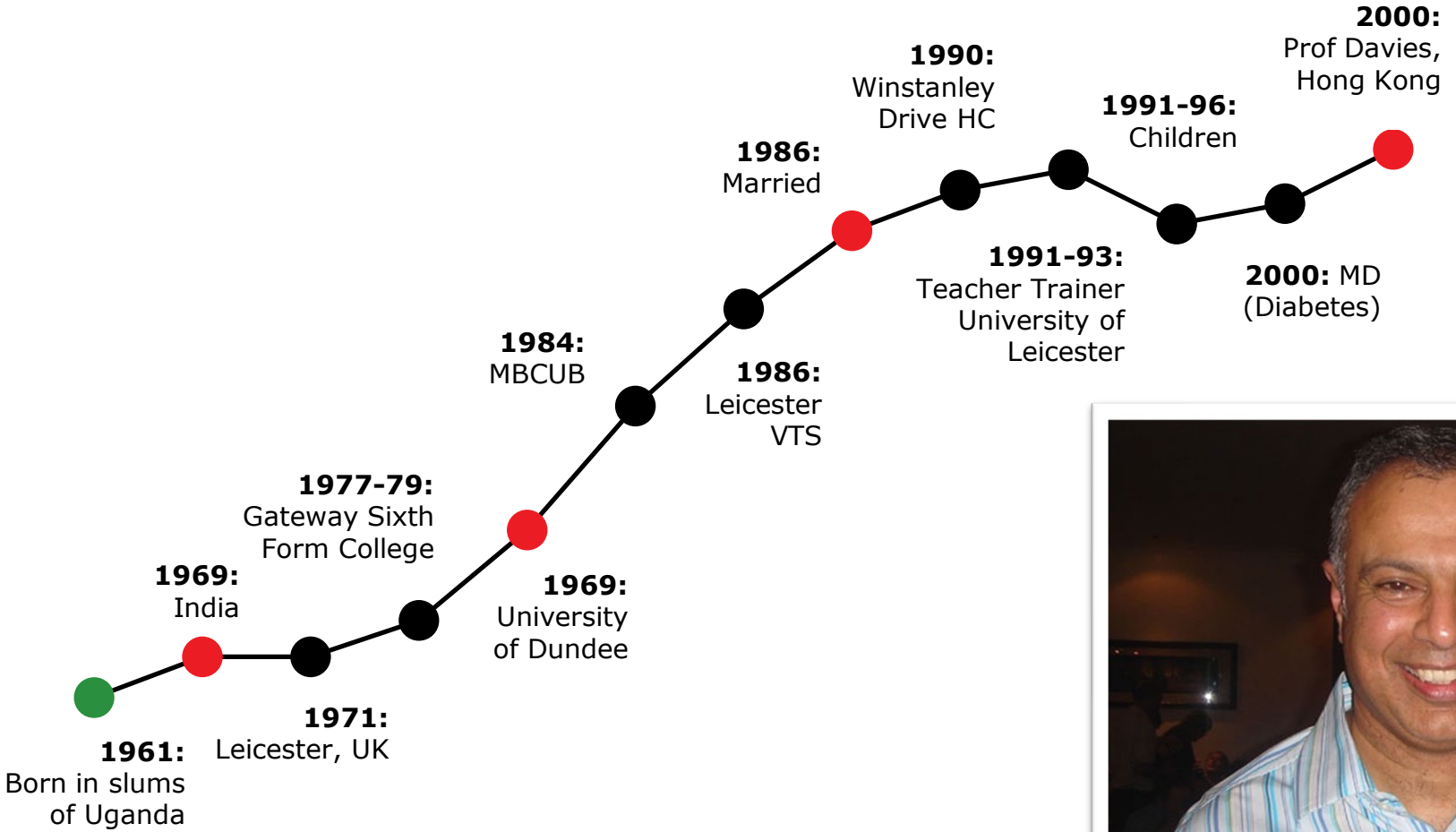
Results

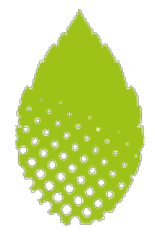
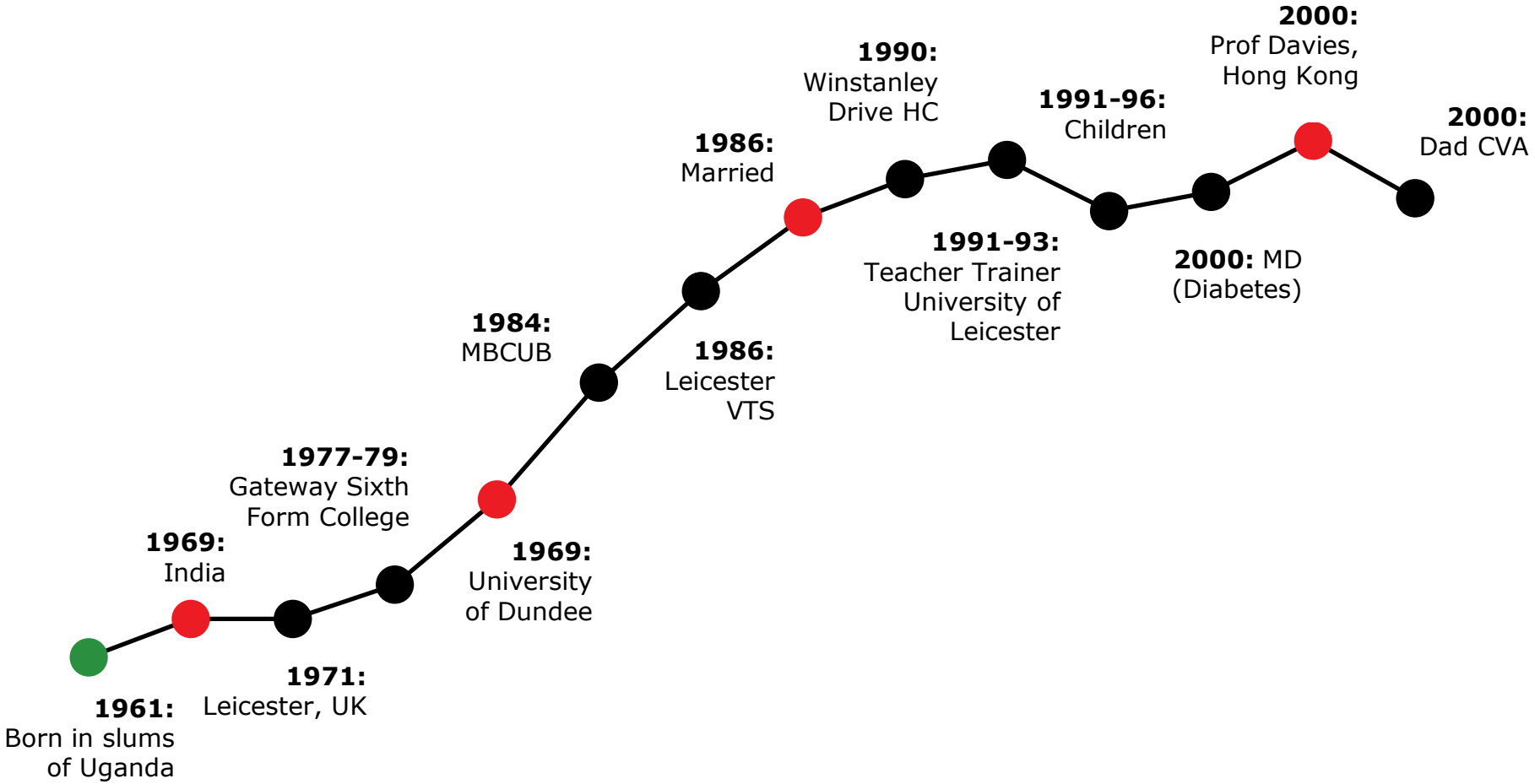
Of the 681 patients recruited to the study 638 (94%) were included in the analysis. The mean age at baseline was 65.7 years (SD = 10.8 years) with a median (interquartile range) duration of diabetes of 4 (1–8) years. The proportion of patients with HbA1c

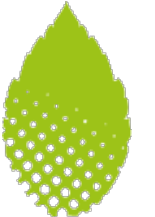
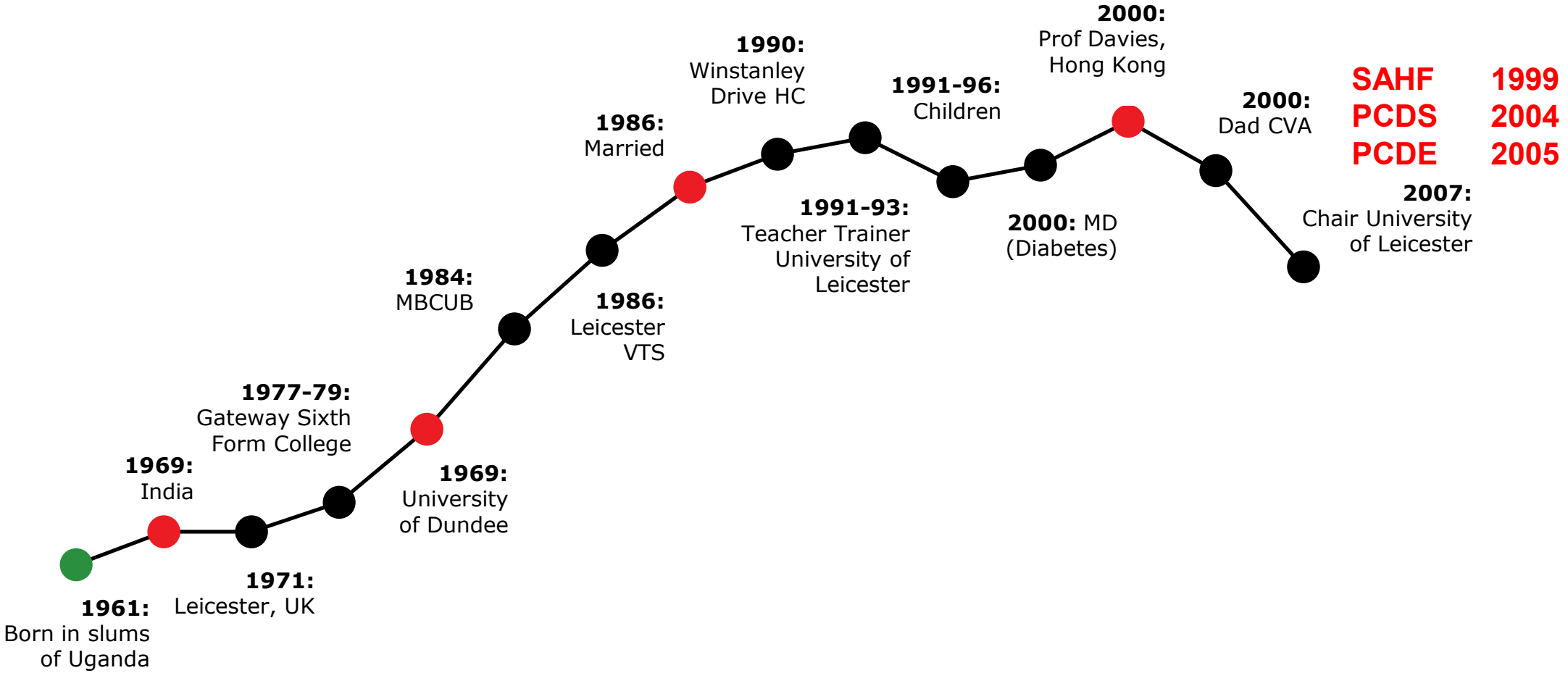
INTRODUCTION

Diabetes is a common chronic condition managed largely in primary care. Patients with diabetes are at high risk of developing complications including cardiovascular disease, with increased associated mortality. However, tight glycaemic control can lead to a reduction in microvascular and possibly also macrovascular complications.^{1,2} There is evidence that direct healthcare costs are lower in patients who have either tight glycaemic control,^{3,4} or whose control is improving.⁵ Despite the evidence, there are wide variations in care between general practices in terms of glycaemic control.^{6,7} The National Service Framework for diabetes emphasises the importance of structured diabetes care programmes including regular recall and review.⁸ The traditional method of testing for glycaemic control in primary care involves sending a blood sample away for laboratory testing and waiting a number of days for the result to be returned. General practices vary in how they deal with this time delay between testing and result. In some, the patient is asked to attend for a blood test up to 2 weeks before their diabetic review involving an extra









CLINICAL TRIALS

Disease management programme for secondary prevention of coronary heart disease and heart failure in primary care: a cluster randomised controlled trial

Kamlesh Khunti, Margaret Stone, Sanjoy Paul, Jan Baines, Louise Gisborne, Azhar Farooqi, Xiujie Luan, Iain Squire

Heart 2007;93:1398-1405. doi: 10.1136/hrt.2006.106955

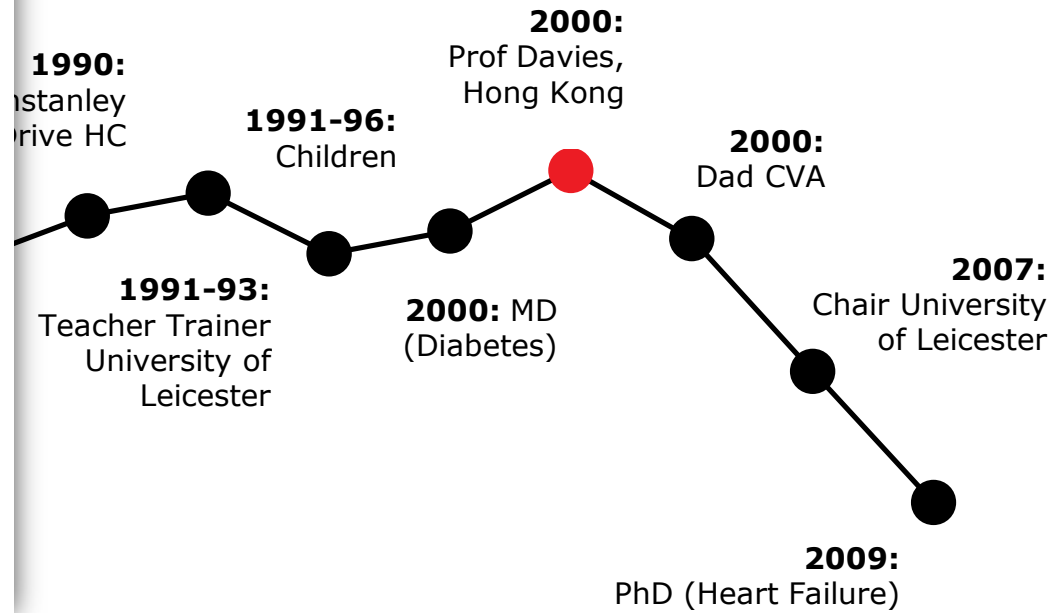
Aims: To evaluate the effect of a disease management programme for patients with coronary heart disease (CHD) and chronic heart failure (CHF) in primary care.
Methods: A cluster randomised controlled trial of 1316 patients with CHD and CHF from 20 primary care practices in the UK was carried out. Care in the intervention practices was delivered by specialist nurses trained in the management of patients with CHD and CHF. Usual care was delivered by the primary healthcare team in the control practices.
Results: At follow up, significantly more patients with a history of myocardial infarction in the intervention group were prescribed a beta-blocker compared to the control group (adjusted OR 1.43, 95% CI 1.19 to 1.99). Significantly more patients with CHD in the intervention group had adequate management of their blood pressure (<140/85 mm Hg) (OR 1.61, 95% CI 1.22 to 2.13) and their cholesterol (<5 mmol/l) (OR 1.58, 95% CI 1.05 to 2.37) compared to those in the control group. Significantly more patients with an unconfirmed diagnosis of CHF had a diagnosis of left ventricular systolic dysfunction confirmed (OR 4.69, 95% CI 1.88 to 11.66) or excluded (OR 3.80, 95% CI 1.50 to 9.64) in the intervention group compared to the control group. There were significant improvements in some quality-of-life measures in patients with CHD in the intervention group.
Conclusions: Disease management programmes can lead to improvements in the care of patients with CHD and presumed CHF in primary care.

See end of article for authors' affiliations

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Accepted 2 January 2007
 Published Online First 16 February 2007

Cardiovascular diseases including coronary heart disease (CHD) and chronic heart failure (CHF) are the main causes of morbidity and mortality in the developed world. Systematic reviews indicate that secondary prevention programmes improve the process of care, reduce admissions to hospital and enhance quality of life and functional status in patients with CHD and CHF.



1969:

1969:

Epidemiology

Cost-effectiveness of a disease management programme for secondary prevention of coronary heart disease and heart failure in primary care

D A Turner,¹ S Paul,² M A Stone,³ A Juarez-Garcia,⁴ I Squire,⁵ K Khunti³

ABSTRACT

Objective: To determine if a disease management programme for patients with coronary heart disease and heart failure represents an efficient use of health services resources.
Methods: We carried out an economic evaluation alongside a cluster randomised control trial of 1163 patients with coronary heart disease and chronic heart failure in 20 primary care practices in the United Kingdom. Practices were randomised to either a control group, where patients received standard general practice care, or an intervention group where patients had access to a specialist nurse-led disease management programme. We estimated costs in both groups for coronary heart disease-related resource use. The main outcome measure used in the economic evaluation was quality adjusted life years (QALY) measured using the EuroQol.
Results: The disease management programme was associated with an increase in the QALY measured of £425 (€540), of this only £83 was directly associated with the provision of the nurse clinics. The clinics generated additional QALY at an incremental cost of £13 158 per QALY compared to the control group.
Conclusions: The use of a nurse-led disease management programme is associated with increased costs in other coronary heart disease-related services as well as

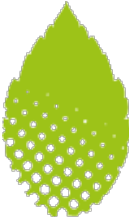
of aspirin.⁴ Secondary prevention has been shown to be effective in improving quality of life, functional status and in reducing hospital admissions in patients with coronary heart disease.⁵ In the United Kingdom a variety of secondary prevention methods are recommended by the National Institute for Health and Clinical Effectiveness (NICE).⁶ There is also evidence to suggest that many forms of secondary prevention may be cost-effective; examples include angiotensin-converting enzyme (ACE) inhibitors,⁷⁻⁹ β-blockers after myocardial infarction,¹⁰ statins for the secondary prevention of coronary heart disease¹¹⁻¹⁴ and the use of aspirin.¹⁵

However, despite the demonstrated effectiveness and cost-effectiveness of many secondary prevention strategies, there is potential to increase the use of secondary prevention for coronary heart disease in primary care.¹⁶⁻¹⁷ One effective method of improving outcomes for patients in primary care is prompted care in nurse-run primary care clinics.¹⁸⁻¹⁹ A recent study has shown that such a disease management programme using community cardiology nurse-led clinics for patients with coronary heart disease and heart failure can be effective in improving both clinical outcomes and quality of life.²⁰ This paper builds upon this work by presenting the results of an economic analysis

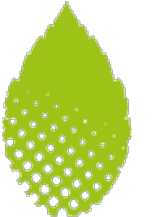
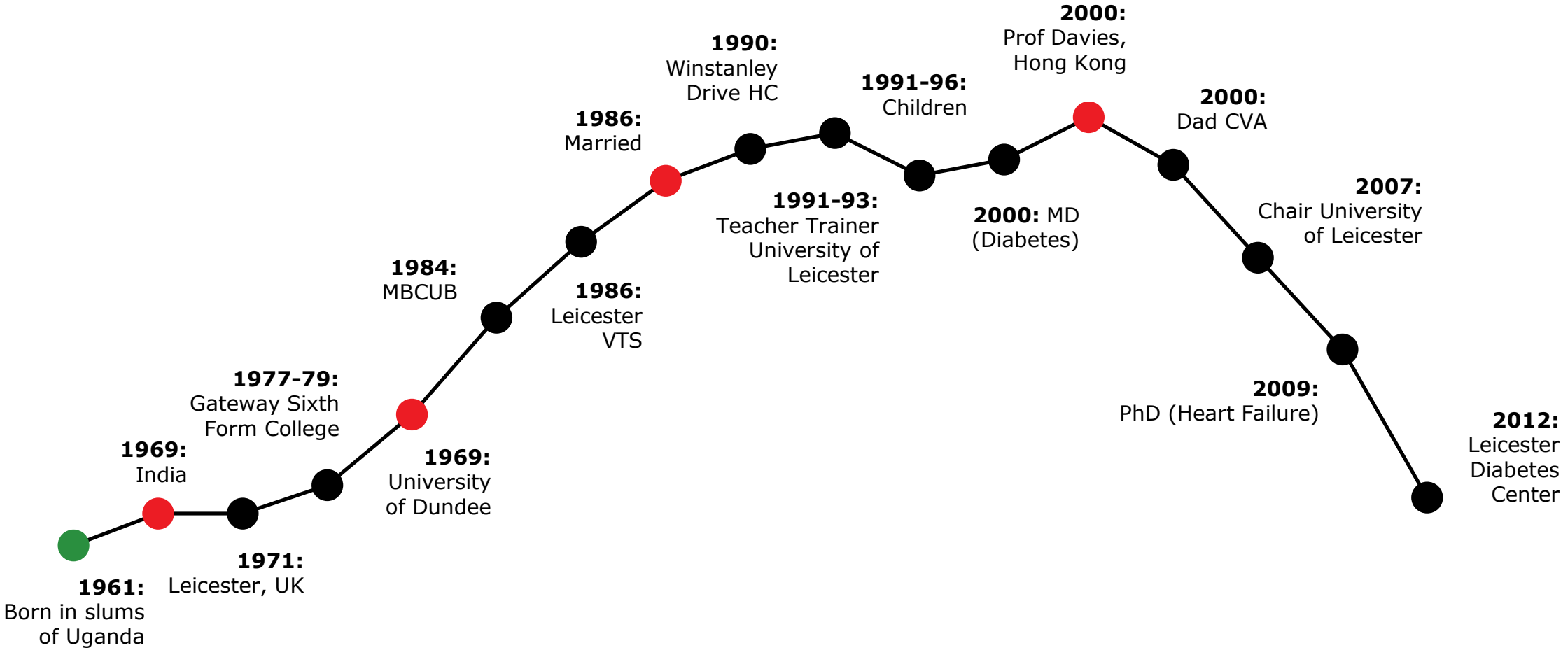
¹ Wessex Institute for Health Research and Development, University of Southampton, Southampton, UK; ² Diabetes Trials Unit, Oxford Centre for Diabetes, Endocrinology and Metabolism, Oxford, UK; ³ Division of General Practice & PHC, Department of Health Sciences, University of Leicester, Leicester, UK; ⁴ Health Services Management Centre, University of Birmingham, UK; ⁵ Department of Cardiovascular Sciences, University of Leicester, Leicester, UK

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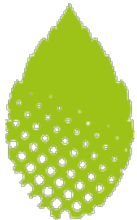
Accepted 27 February 2008
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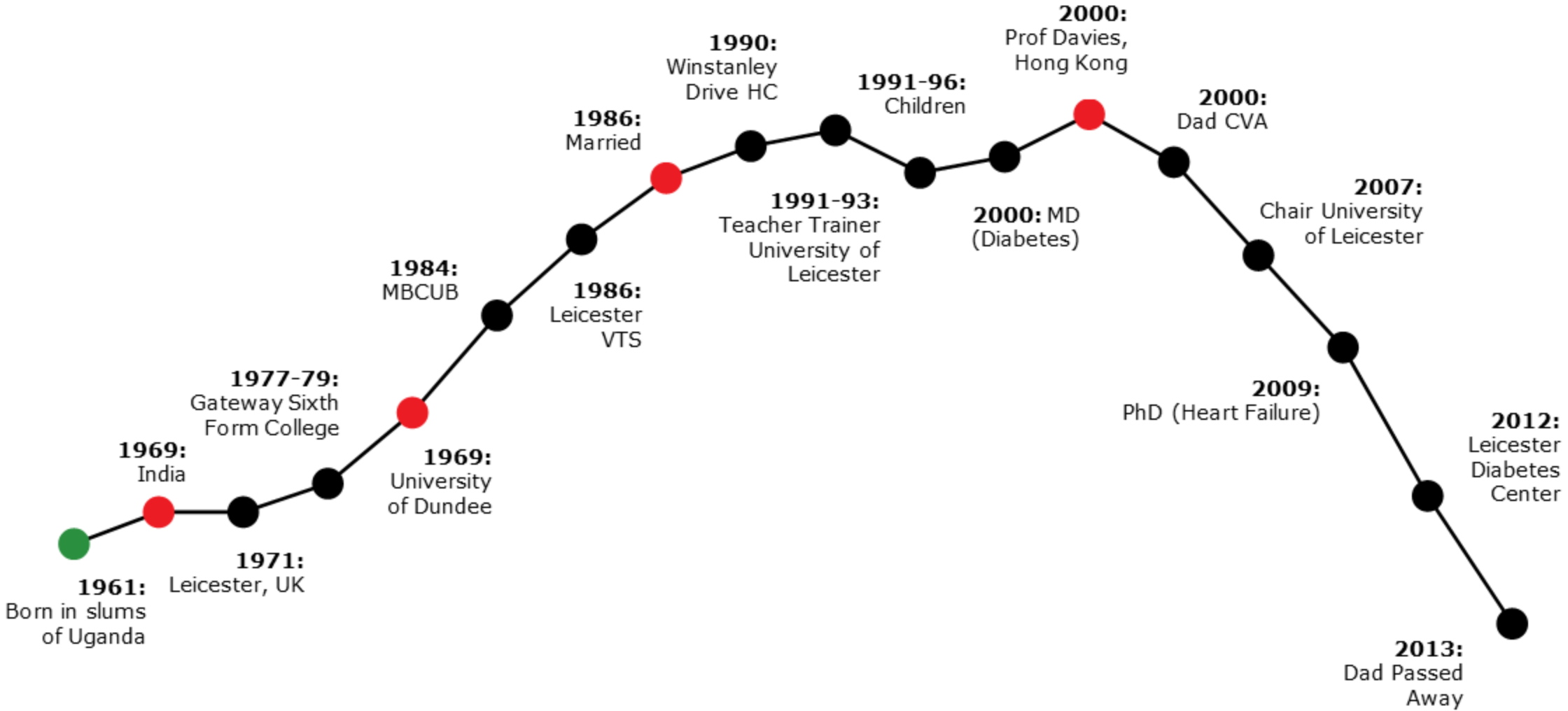


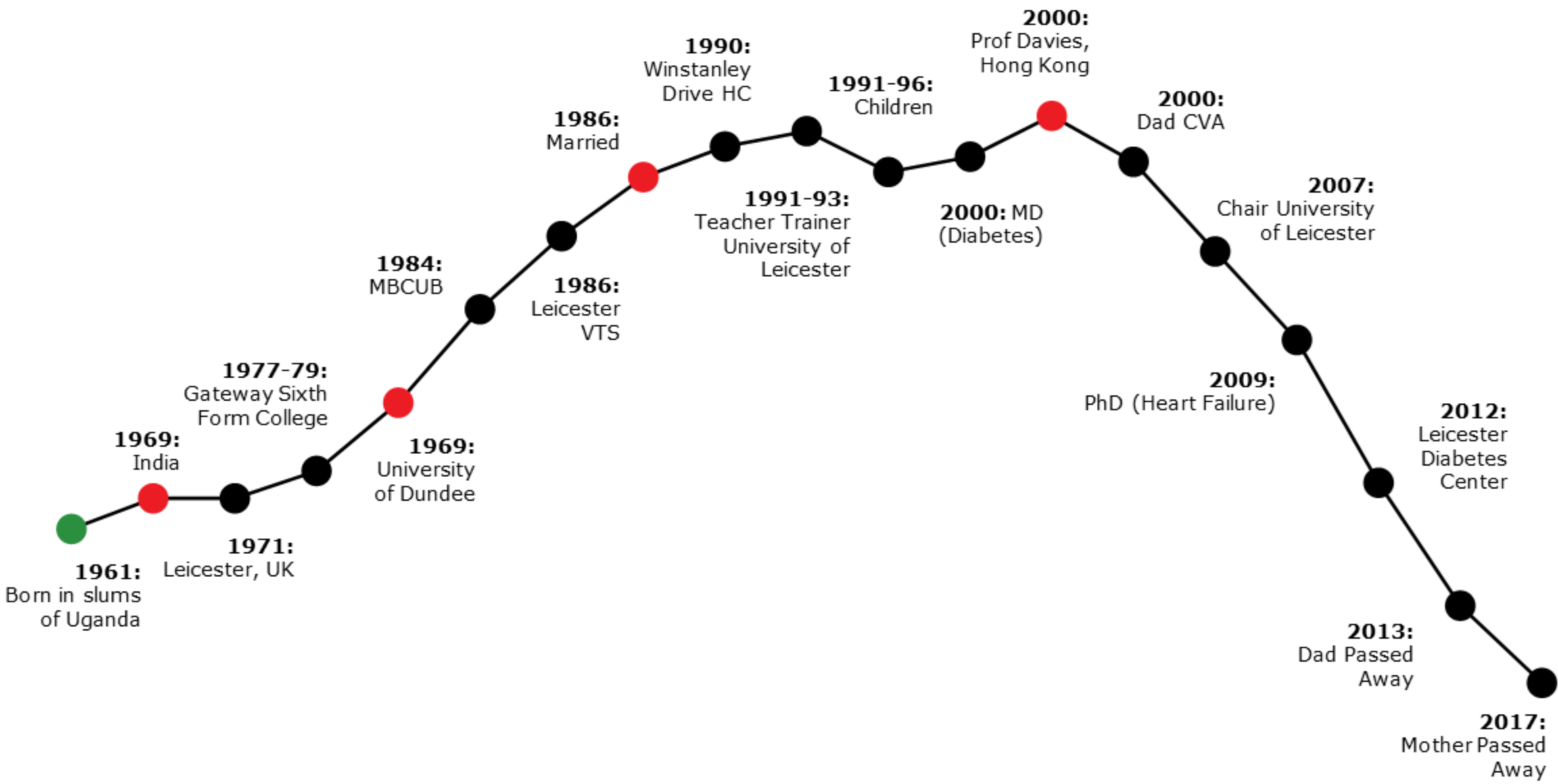
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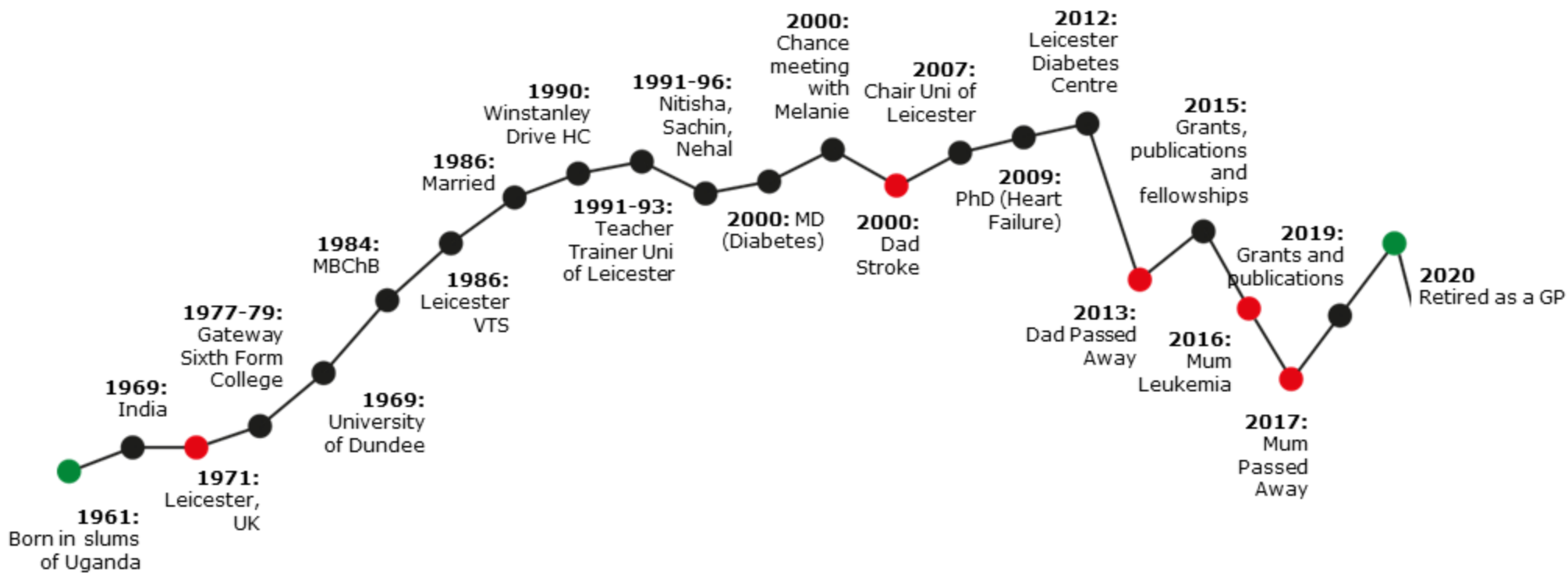


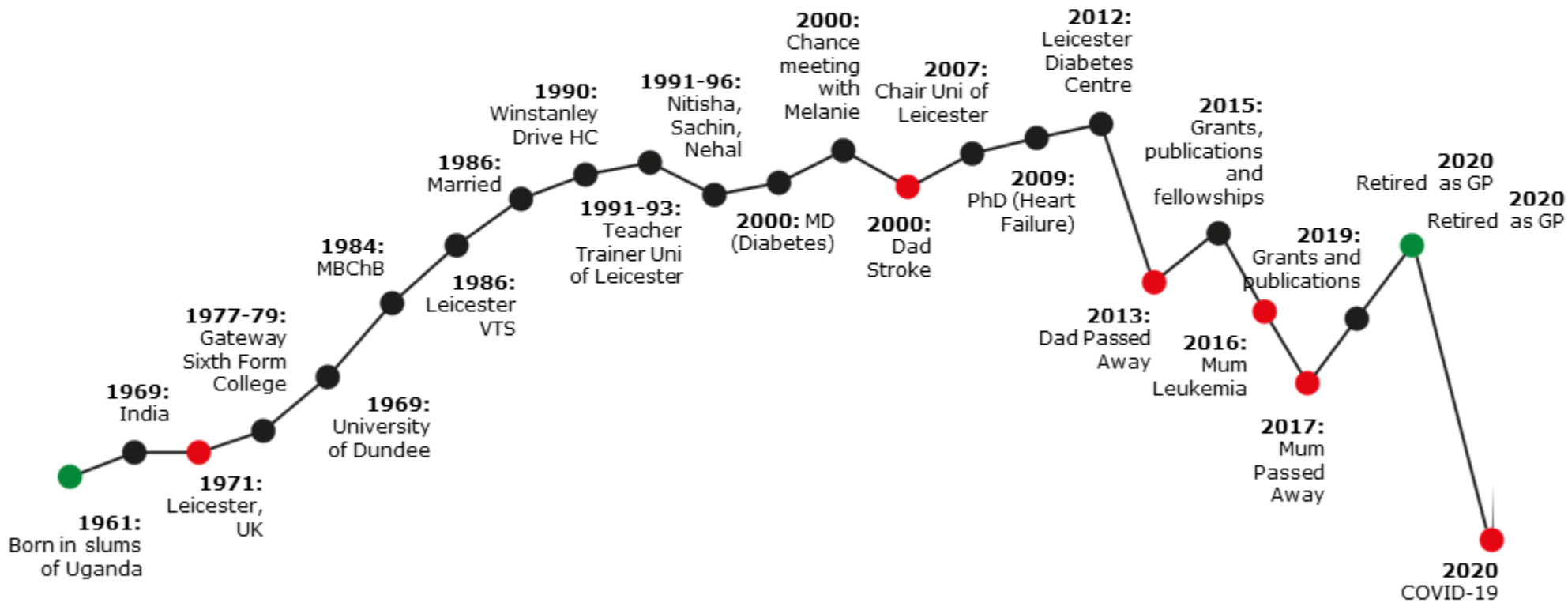
Leicester Diabetes Centre Phase 1 April 2012

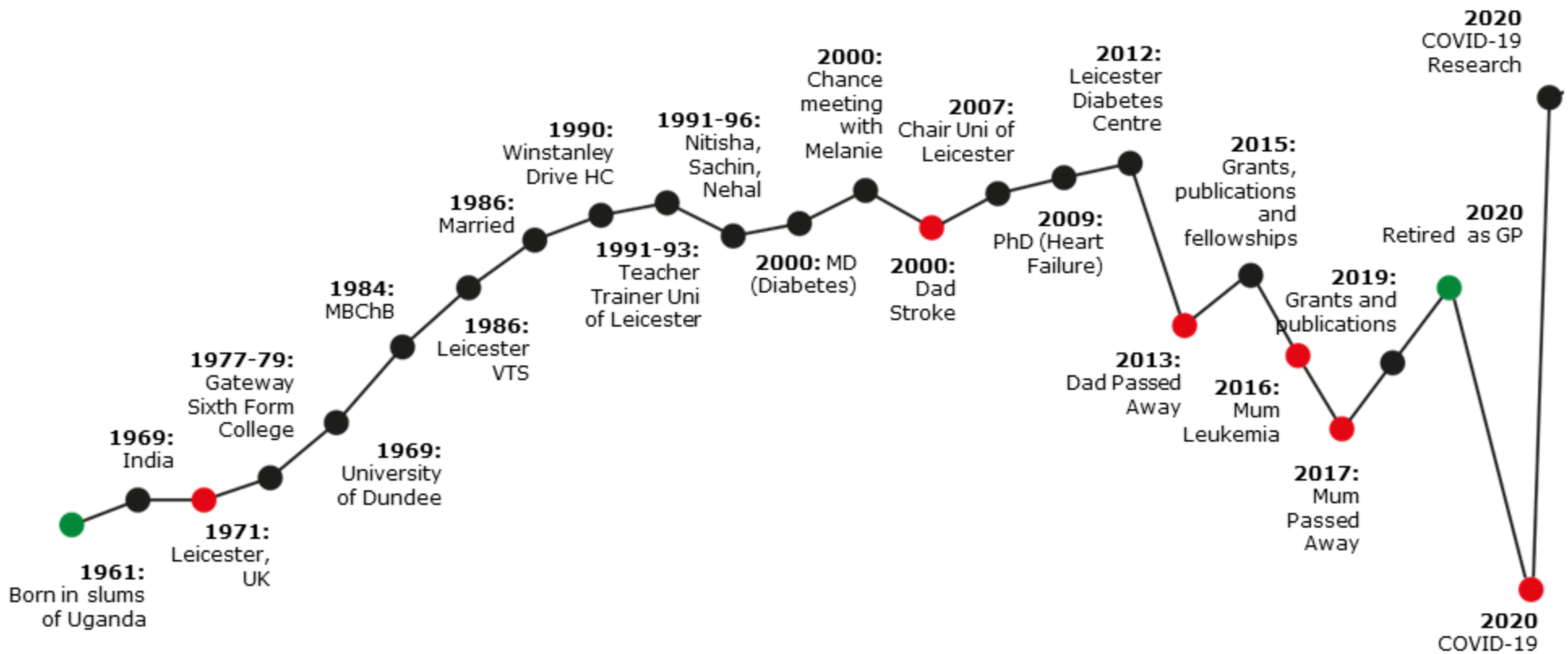


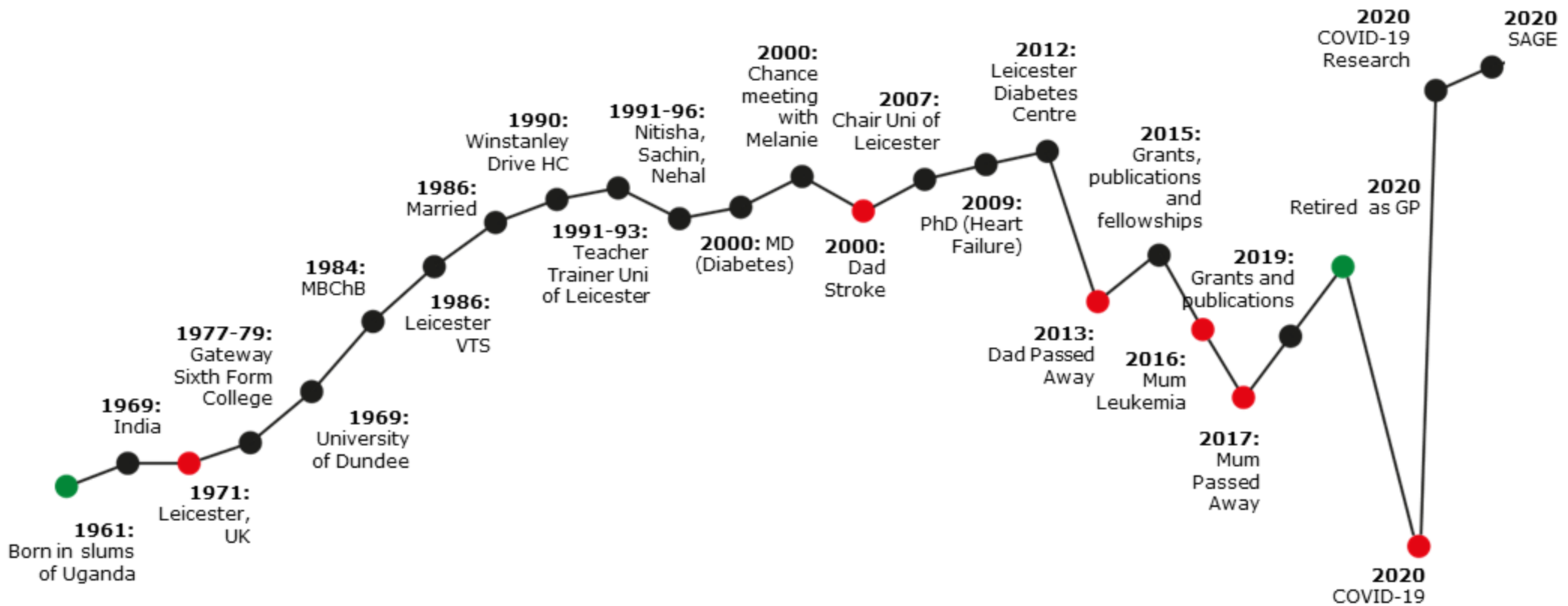




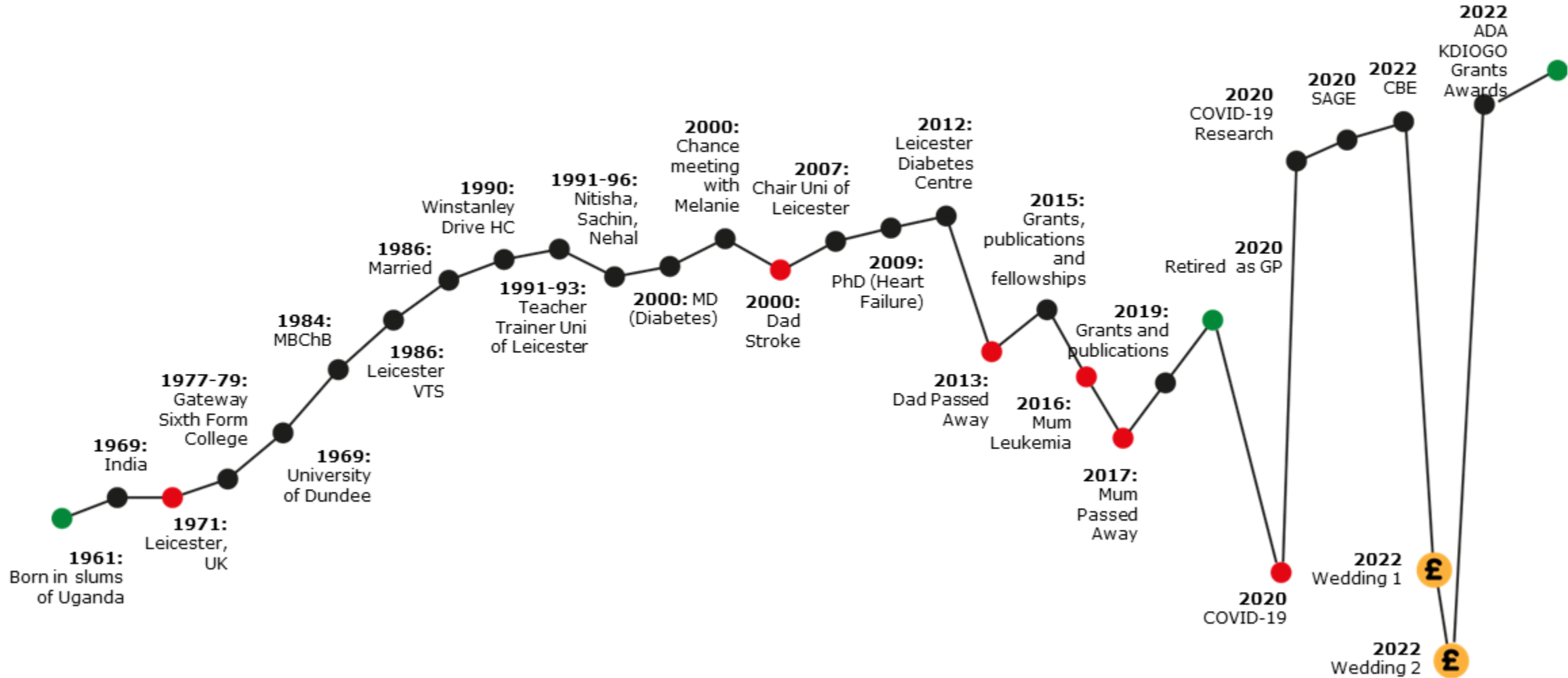








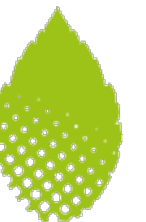
2022 has been an incredible year!



Wedding 1 April 2022: Sachin

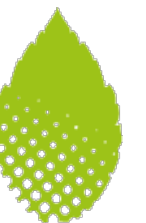


Wedding 2 September 2022: Nitisha



Summary of work

- Epidemiology
- Interventional & innovations



Mis-classification of diabetes

DIABETICMedicine

DOI: 10.1111/j.1464-5491.2009.02920.x

Review Article

Incorrect and incomplete coding and classification of diabetes: a systematic review

M. A. Stone, J. Camosso-Stefinovic, J. Wilkinson, S. de Lusignan*, A. T. Hattersley† and K. Khunti

Department of Health Sciences, University of Leicester, Leicester, *Primary Care Informatics, St George's Hospital Medical School, University of London, London and †Peninsula Medical School, Exeter, UK

Accepted 25 November 2009

Research

Suzy V Hope, Sophie Wienand-Barnett, Maggie Shepherd, Sophie M King, Charles Fox, Kamlesh Khunti, Richard A Oram, Bea A Knight, Andrew T Hattersley, Angus G Jones and Beverley M Shields

Practical Classification Guidelines for Diabetes in patients treated with insulin:

a cross-sectional study of the accuracy of diabetes diagnosis



Research article

An algorithm to improve diagnostic accuracy in diabetes in computerised problem orientated medical records (POMR) compared with an established algorithm developed in episode orientated records (EOMR)

Simon de Lusignan

Cite this article: de Lusignan S, Liaw S-T, Dedman D, Khunti K, Sadek K, Jones S. An algorithm to improve diagnostic accuracy in diabetes in computerised problem orientated medical records (POMR)

DIABETICMedicine

DOI: 10.1111/j.1464-5491.2011.03419.x

Article: Epidemiology

Miscoding, misclassification and misdiagnosis of diabetes in primary care

S. de Lusignan¹, N. Sadek², H. Mulnier³, A. Tahir¹, D. Russell-Jones^{1,3} and K. Khunti⁴

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Accepted 19 August 2011

DOI: 10.1111/j.1464-5491.2009.02917.x

Original Article: Organisation and Delivery of Care

A method of identifying and correcting miscoding, misclassification and misdiagnosis in diabetes: a pilot and validation study of routinely collected data

S. de Lusignan, K. Khunti*, J. Belsey, A. Hattersley†, J. van Vlymen, H. Gallagher‡, C. Millett§, N. J. Hague, C. Tomson¶, K. Harris** and A. Majeed§

St George's—University of London, London, *University of Leicester, Leicester, †Peninsula Medical School, Exeter, ‡South West Thames Renal Unit, St Heller Hospital, Surrey, §Imperial College Faculty of Medicine, London, ¶Southmead Hospital, Bristol and **University Hospitals of Leicester NHS Trust, Leicester, UK

Accepted 19 November 2009

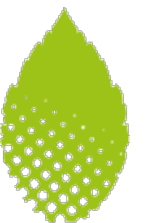
ORIGINAL PAPER

THE INTERNATIONAL JOURNAL OF
CLINICAL PRACTICE

ec Editor's
Choice

Evaluating tools to support a new practical classification of diabetes: excellent control may represent misdiagnosis and omission from disease registers is associated with worse control

N. Hassan Sadek,¹ A.-R. Sadek,¹ A. Tahir,¹ K. Khunti,² T. Desombre,¹ S. de Lusignan¹



Screening for diabetes & health checks programme

Original Article: Epidemiology
The Leicester Risk Assessment score for detecting undiagnosed Type 2 diabetes and impaired glucose regulation for use in a multiethnic UK setting

L. J. Gray*, N. A. Taub*, K. Khunti*, E. Gardiner*, S. Hiles†, D. R. Webb†, B. T. Srinivasan† and M. J. Davies†

*Department of Health Sciences, University of Leicester, UK, †Department of Diabetes Research, University Hospitals of Leicester, Leicester, UK and ‡Department Cardiovascular Sciences, University of Leicester, Leicester, UK

Diabetes Research and Clinical Practice
External validation of two diabetes risk scores in a young UK South Asian population

L.J. Gray^{a*}, K. Khunti^b, E.G. Wilmot^b, T. Yates^b, M.J. Davies^b

^aUniversity of Leicester, Department of Health Sciences, Leicester, UK
^bUniversity of Leicester, Diabetes Research Centre, Leicester Diabetes Centre, Leicester, UK

Diabetologia (2012) 55:3238–3244
Implementation of the automated Leicester Practice Risk Score in two diabetes prevention trials provides a high yield of people with abnormal glucose tolerance

L. J. Gray · K. Khunti · C. Edwardson · S. Goldby · J. Henson · D. H. Morris · D. Sheppard · D. Webb · S. Williams · T. Yates · M. J. Davies

Diabetologia (2012) 55:959–966
Detection of impaired glucose regulation and/or type 2 diabetes mellitus, using primary care electronic data, in a multiethnic UK community setting

L. J. Gray · M. J. Davies · S. Hiles · N. A. Taub · D. R. Webb · B. T. Srinivasan · K. Khunti

Received: 8 July 2011 / Accepted: 7 December 2011 / Published online: 10 January 2012
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TYPE 2 DIABETES
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ਕੀ ਤੁਹਾਨੂੰ ਟਾਈਪ 2 ਡਾਇਆਬੀਟੀਜ਼ ਹੋ ਸਕਦੀ ਹੈ?

ਡਾਇਆਬੀਟੀਜ਼ (ਸ਼ੂਗਰ ਦੀ ਬੀਮਾਰੀ)

ਬੁੱਠੇ ਟਮਰੇ ਟਾਈਪ 2 ਡਾਇਆਬੀਟੀਜ਼ ਫਿੱਠੇ ਬਣਦੇ?

ਡਾਇਆਬੀਟੀਜ਼

ਆਪਨਾਰ ਕਿ ਟਾਈਪ 2 ਡਾਇਆਬੀਟੀਜ਼ 'ਏਰ ਸਭਾਬਨਾ ਆਵੇ ?

ਡਾਇਆਬੀਟੀਜ਼

Self Management education programmes for T2DM- DESMOND Programme

BMJ

RESEARCH

Effectiveness of the diabetes education and self management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: cluster randomised controlled trial

M J Davies, professor of diabetes medicine,¹ S Heller, professor of clinical diabetes,² T C Skinner, associate professor in health psychology,³ M J Campbell, professor of medical statistics,⁴ M E Carey, national director,⁵ S Craddock, nurse consultant,⁶ H M Dalosso, research associate,⁷ H Daly, nurse consultant,⁷ Y Doherty, consultant clinical psychologist,⁸ S Eaton, consultant diabetologist,⁴ C Fox, consultant physician,⁹ I Oliver, consultant dietitian,⁴ K Rantell, research fellow in statistics,⁴ G Rayman, consultant physician,¹⁰ K Khunti, professor of primary care diabetes and vascular medicine,¹¹ on behalf of the Diabetes Education and Self Management for Ongoing and Newly Diagnosed Collaborative

Abstract
Objective To evaluate the effectiveness of a structured group education programme on biomedical, psychosocial, and lifestyle measures in people with newly diagnosed type 2 diabetes.

Design Multicentre cluster randomised controlled trial in primary care with randomisation at practice level.

Setting 207 general practices in 13 primary care sites in the United Kingdom.

Participants 824 adults (55% men, mean age 59.5 years).

Intervention A structured group education programme for six hours delivered in the community by two trained healthcare professional educators compared with usual care.

Main outcome measures Haemoglobin A_{1c} levels, blood pressure, weight, blood lipid levels, smoking status, physical activity, quality of life, beliefs about illness, depression, and emotional impact of diabetes at baseline and up to 12 months.

Main results Haemoglobin A_{1c} levels at 12 months had decreased by 1.49% in the intervention group compared with 1.21% in the control group. After adjusting for baseline and cluster, the difference was not significant: 0.05% (95% confidence interval -0.10% to 0.20%). The intervention group showed a greater weight loss: -2.98 kg (95% confidence interval -3.54 to -2.41) compared with -1.86 kg (-2.44 to -1.28), P=0.027 at 12 months. The odds of not smoking were 3.56 (95% confidence interval 1.11 to 11.45), P=0.033 higher in the intervention group at 12 months. The intervention group showed significantly greater changes in illness belief scores (P<0.001); directions of change were positive indicating greater understanding of diabetes. The intervention group had a lower depression score at 12 months: mean difference was -0.50 (95% confidence interval -0.96 to -0.04); P=0.032. A positive association was found between

change in perceived personal responsibility and weight loss at 12 months (β=0.12; P=0.008).

Conclusion A structured group education programme for patients with newly diagnosed type 2 diabetes resulted in greater improvements in weight loss and smoking cessation and positive improvements in beliefs about illness but no difference in haemoglobin A_{1c} levels up to 12 months after diagnosis.

Trial registration Current Controlled Trials ISRCTN17844016.

INTRODUCTION
Type 2 diabetes mellitus affects around 5% of European populations and is responsible for a disproportionate use of health service resources.¹ In the short term diabetes may lead to symptoms and debility and in the long term can lead to serious complications such as blindness, renal failure, and amputation.² Furthermore, diabetes is associated with increased morbidity and premature death from cardiovascular disease, including stroke and myocardial infarction. In clinical practice in the United Kingdom primary care teams are now financially rewarded for achieving tight glycaemic and metabolic targets in patients under their care and this has led to improved levels of glycaemic control, particularly in patients with type 2 diabetes.³ Although the diabetes national service framework has made recommendations for wider provision of group structured education, currently no evidence supports the belief that structured education provides added benefit for patients from the point of diagnosis.

Despite the initial successful impact of oral medication, patients find it difficult to implement and sustain the treatment and lifestyle advice given by healthcare professionals.⁴ This may in part relate to traditional approaches to management in which patients are

BMJ

BMJ 2012;344:e2333 doi: 10.1136/bmj.e2333 (Published 26 April 2012)

Page 1 of 12

RESEARCH

Effectiveness of a diabetes education and self management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus: three year follow-up of a cluster randomised controlled trial in primary care

OPEN ACCESS

Kamlesh Khunti professor of primary care diabetes and vascular medicine¹, Laura J Gray lecturer of population and public health sciences¹, Timothy Skinner director rural clinical school², Marian E Carey national director, DESMOND programme³, Kathryn Reall research assistant², Helen Dalosso research associate⁴, Harriet Fisher research assistant¹, Michael Campbell professor of medical statistics⁵, Simon Heller professor of clinical diabetes⁶, Melanie J Davies professor in diabetes medicine⁶

¹Department of Health Sciences, University of Leicester, Leicester LE1 6TP, UK; ²Rural Clinical School, University of Tasmania, Tasmania, Australia; ³Diabetes Research, University Hospitals of Leicester, Leicester, UK; ⁴Health Services Research, SCHARR, University of Sheffield, Sheffield, UK; ⁵Department of Human Metabolism, University of Sheffield, Sheffield, UK; ⁶Department of Cardiovascular Sciences, University of Leicester

Abstract
Objective To measure whether the benefits of a single education and self management structured programme for people with newly diagnosed type 2 diabetes mellitus are sustained at three years.

Design Three year follow-up of a multicentre cluster randomised controlled trial in primary care, with randomisation at practice level.

Setting 207 general practices in 13 primary care sites in the United Kingdom.

Participants 731 of the 824 participants included in the original trial were eligible for follow-up. Biomedical data were collected on 604 (82.6%) and questionnaire data on 513 (70.1%) participants.

Intervention A structured group education programme for six hours delivered in the community by two trained healthcare professional educators compared with usual care.

Main outcome measures The primary outcome was glycated haemoglobin (HbA_{1c}) levels. The secondary outcomes were blood pressure, weight, blood lipid levels, smoking status, physical activity, quality of life, beliefs about illness, depression, emotional impact of diabetes, and drug use at three years.

Results HbA_{1c} levels at three years had decreased in both groups. After adjusting for baseline and cluster the difference was not significant (difference -0.02, 95% confidence interval -0.22 to 0.17). The groups did not differ for the other biomedical and lifestyle outcomes and drug use. The significant benefits in the intervention group across four out of five health beliefs seen at 12 months were sustained at three years (P<0.01). Depression scores and quality of life did not differ at three years.

Conclusion A single programme for people with newly diagnosed type 2 diabetes mellitus showed no difference in biomedical or lifestyle outcomes at three years although there were sustained improvements in some illness beliefs.

Trial registration Current Controlled Trials ISRCTN17844016.

Introduction

Type 2 diabetes mellitus is a serious, progressive condition presenting with chronic hyperglycaemia, and its prevalence is increasing globally. In the short term, type 2 diabetes may lead to symptoms and debility and in the long term to serious complications, including blindness, renal failure, and amputation.¹ Furthermore, three quarters of people with type 2

Correspondence to: K Khunti kk22@le.ac.uk

Extra material supplied by the author (see <http://www.bmj.com/content/344/bmj.e2333/related-figures>)
Quality of life data at three years

Review



Diabetes structured self-management education programmes: a narrative review and current innovations

Sudesh Chatterjee, Melanie J Davies, Simon Heller, Jane Speight, Frank Snook, Kamlesh Khunti

Lancet Diabetes Endocrinol 2012; 6:130-43
September 29, 2012
[http://dx.doi.org/10.1016/S2213-8581\(12\)30259-2](http://dx.doi.org/10.1016/S2213-8581(12)30259-2)
This online publication has been corrected.
The corrected version first appeared at <http://www.bmj.com> on October 26, 2012

Diabetes Research Centre, University of Leicester, Leicester, UK (S Chatterjee MD, Prof M J Davies MD, Prof K Khunti PhD), Department of Diabetes and Endocrinology, University Hospitals of Leicester, Leicester, UK (S Chatterjee), Academic Unit of Diabetes, Endocrinology, and Metabolism, University of Sheffield, Sheffield, UK (Prof S Heller DMS School of Psychology, Faculty of Health, Deakin University, Geelong, VIC, Australia (Prof J Speight PhD), Australian Centre for Behavioural Research in Diabetes, Diabetes Victoria, Melbourne, VIC, Australia (Prof J Speight), AHP Research, Horsham, Essex, UK (Prof J Speight), and Department of Medical Psychology, Academic Medical Centre and VU University Medical Centre, Amsterdam, Netherlands (Prof J Snook PhD)

Correspondence to: Prof Kamlesh Khunti, Diabetes Research Centre, University of Leicester, Leicester General Hospital, Leicester LE5 4PR, UK. kk22@le.ac.uk

Introduction

Diabetes affects 415 million people worldwide, and an estimated further 193 million have undiagnosed type 2 diabetes. Around 90% of people with diabetes have type 2 diabetes, which is associated with genetic and lifestyle risk factors including obesity and sedentary behaviour and can be prevented or delayed in around 60% of cases.¹ About 10% of people with diabetes have type 1 diabetes, which has an autoimmune pathophysiology and is not preventable at present. Achievement of individualised glycaemic targets minimises development and progression of macrovascular and microvascular complications associated with diabetes.

In 1993, the Diabetes Control and Complications Trial (DCCT) showed the benefits of intensive glycaemic management of type 1 diabetes on the development and progression of complications² and mortality.³ In 1998, the United Kingdom Diabetes Prospective Study⁴ showed that intensive glycaemic management improved outcomes in adults with type 2 diabetes, which was subsequently shown in several large randomised controlled trials.⁵⁻⁷ Outcomes depend on how effectively individuals can implement and sustain complex self-management skills in daily life. National and international bodies including the UK-based National Institute for Health and Care Excellence (NICE),⁸ USA National Standards,⁹ and International Diabetes Federation International Standards for Diabetes Education¹⁰ recommend that, with pharmacological therapy, diabetes self-management education and ongoing support should be key components of autonomous and optimal self-management care.

Early access to and provision of diabetes self-management education increases empowerment, which is defined by WHO as "a process through which people gain greater control over decisions and actions affecting their health."¹¹ The content of diabetes self-management education programmes should aim to help people with

Both type 1 and type 2 diabetes are associated with long-term complications that can be prevented or delayed by intensive glycaemic management. People who are empowered and skilled to self-manage their diabetes have improved health outcomes. Over the past 20 years, diabetes self-management education programmes have been shown to be efficacious and cost-effective in promotion and facilitation of self-management, with improvements in patients' knowledge, skills, and motivation leading to improved biomedical, behavioural, and psychosocial outcomes. Diabetes self-management education programmes, developed robustly with an evidence-based structured curriculum, vary in their method of delivery, content, and use of technology, person-centred philosophy, and specific aims. They are delivered by trained educators, and monitored for quality by independent assessors and routine audit. Self-management education should be tailored to specific populations, taking into consideration the type of diabetes, and ethnic, social, cognitive, literacy, and cultural factors. Ways to improve access to and uptake of diabetes self-management programmes are needed globally.

Diabetes improve lifestyle (physical activity and diet), weight, HbA_{1c}, lipids, blood pressure, health beliefs, and knowledge about diabetes; increase treatment satisfaction, medication adherence, emotional wellbeing, and quality of life; and encourage smoking cessation and appropriate glucose monitoring. Self-management skills are crucial because people with diabetes are responsible for making most of the decisions—such as about dietary choices, physical activity, medication-taking, glucose-monitoring, carbohydrate counting, and insulin dose adjustment—that influence their diabetes, with only intermittent input from health-care professionals. The American Association of Diabetes Educators have defined seven key self-care behaviours that diabetes educators should address: healthy eating, physical activity, monitoring glucose, medication use, risk reduction, problem solving, and healthy coping.¹² Systematic reviews have shown that diabetes self-management education improves glycaemic control in type 1 diabetes¹³ and type 2 diabetes,¹⁴ as well as psychosocial and behavioural outcomes (table 1).^{15,16}

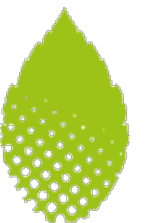
In this review, we examine the effectiveness of diabetes self-management education on biomedical, behavioural, and psychosocial outcomes among adults with type 1 and type 2 diabetes, as well as cost-effectiveness, methods of delivery, and barriers to uptake. We also address areas for further research.

Diabetes self-management education: definition and background

The American Diabetes Association defines diabetes self-management education as the ongoing process of facilitating knowledge, skills, and abilities necessary for diabetes self-care, and incorporates a person-centred approach and shared decision making (panel 1).¹⁷ In the UK, NICE recommends diabetes self-management education and states that it should consist of an evidence-based structured curriculum, with specific aims and objectives delivered by trained educators, and outcomes that are

Other self management programmes

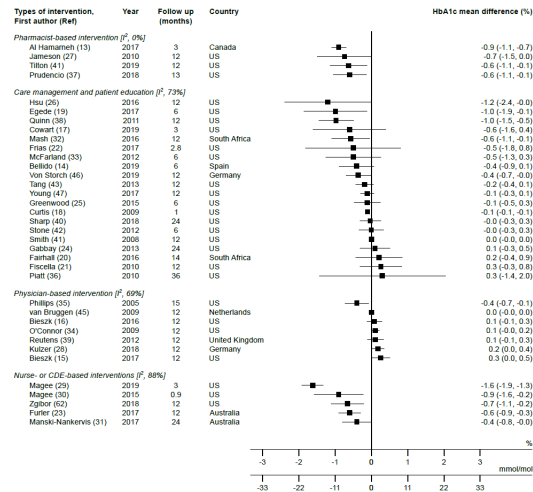
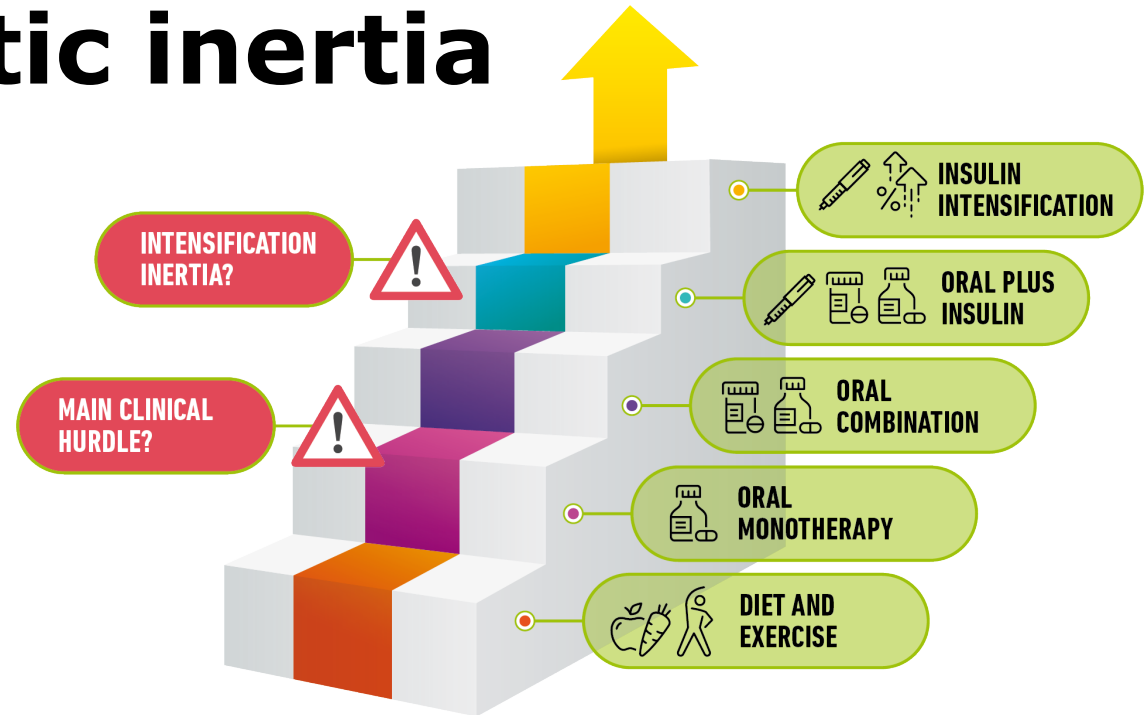
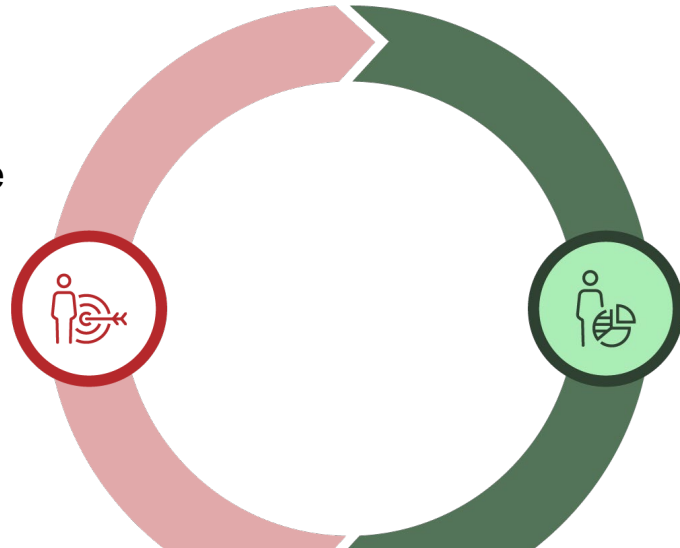
- Gestational Diabetes
- PCOS
- Young Type 2 diabetes
- Ramadan



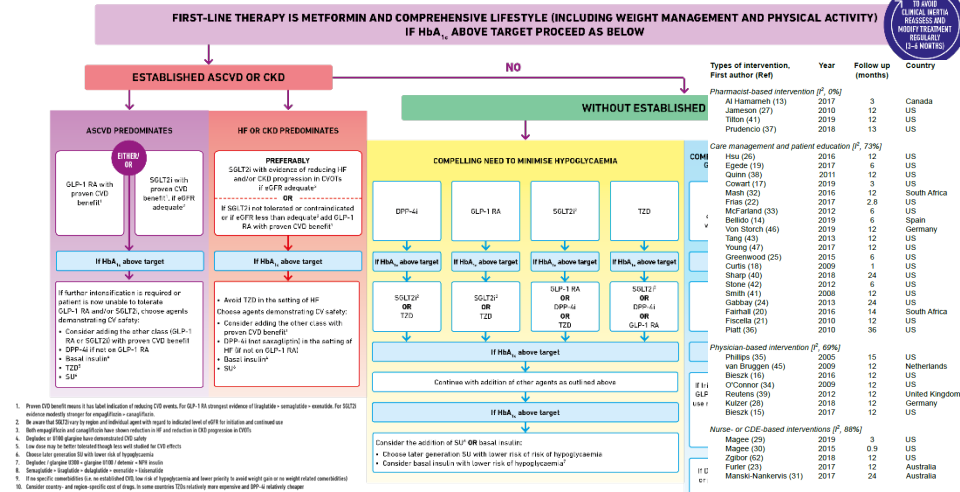
Therapeutic inertia

THERAPEUTIC INERTIA:

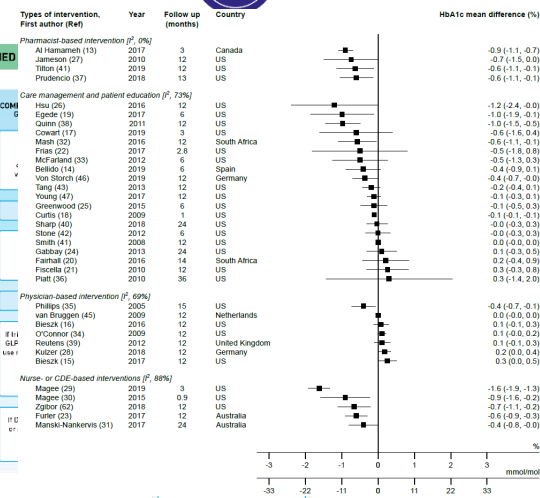
The failure to advance or deintensify the treatment regimen when a patient's therapeutic goals are not met.



GLUCOSE-LOWERING MEDICATION IN TYPE 2 DIABETES: OVERALL APPROACH



TO AVOID CLINICAL INERTIA, REASSESS AND REEVALUATE (U-S-MO) 10



DSMES, Diabetes Self-Management Education and Support

Hypoglycaemia- UK & Global prevalence & impact on outcomes, Risk prediction

DIABETES RESEARCH AND CLINICAL PRACTICE 130 (2017) 221–230

Contents available at ScienceDirect
Diabetes Research and Clinical Practice

International Diabetes Federation

Impact of hypoglycaemia on patient-reported outcomes from a global, 24-country study of 27,585 people with type 1 and insulin-treated type 2 diabetes

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ARTICLE INFO

Article history: Received 9 September 2016; Accepted 8 May 2017; Available online 12 May 2017

Abstract: Aims: Data on the impact of hypoglycaemia on patients' daily lives and diabetes self-management, particularly in developing countries, are lacking. The aim of this study was to assess fear of, and responses to, hypoglycaemia experienced by patients globally. Methods and results: This non-interventional, multicentre, 4-week prospective study using self-assessment questionnaires and patient diaries consisted of 27,585 patients, achieving good glycaemic control [1] and recent diabetes treatment guidelines highlight the need for personalized glycated haemoglobin (HbA1c) targets to balance reductions in hyperglycaemia with the potential risks of hypoglycaemia [2,3]. Previous studies in hypoglycaemia have been focused on the safety and efficacy of particular drugs [4–7]. Data regarding hypoglycaemia rates obtained from randomized controlled trials, as opposed to observational studies, must be interpreted with caution as these often exclude older patients, and those with recurrent hypoglycaemia, very poor glycaemic control, (HbA1c >10%), or concomitant medical conditions, even though these variables are often seen in the clinic. In addition,

ARTICLE INFO

Article history: Received 8 June 2017; Received in revised form 13 December 2017; Accepted 9 January 2018; Available online 23 January 2018

Keywords: Medical economics; Type 1 diabetes; Type 2 diabetes; Insulin; Diabetes; Hypoglycaemia

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original article

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Rates and predictors of hypoglycaemia in 27 585 people from 24 countries with insulin-treated type 1 and type 2 diabetes: the global HAT study

K. Khunti^a, S. Alsifri^b, R. Aronson^c, M. Cigrovski Berkovic^d, C. Enters-Weijnen^e, T. Forsgren^f, G. Galstyan^g, P. Geelhoed-Duijvestijn^h, M. Goldfrachtⁱ, H. Gydesen^j, R. Kapur^k, N. Lalic^l, B. Ludvik^m, E. Mobergⁿ, U. Pedersen-Bjergaard^o, A. Ramachandran^p on behalf of the HAT Investigator Group

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Aims: To determine the global extent of hypoglycaemia experienced by patients with diabetes using insulin, as there is a lack of data on the prevalence of hypoglycaemia in developed and developing countries.

Methods: This non-interventional, multicentre, 4-month retrospective and 4-week prospective study using self-assessment questionnaires and patient diaries included 27 585 patients, aged ≥18 years, with type 1 diabetes (T1D, n=8222) or type 2 diabetes (T2D, n=19 363) treated with insulin for >12 months, at 2604 sites in 24 countries worldwide. The primary endpoint was the proportion of patients experiencing at least one hypoglycaemic event during the observational period.

Results: During the prospective period, 83.0% of patients with T1D and 44.0% of adults with T2D reported hypoglycaemia. Rates of an nocturnal and severe hypoglycaemia were 7.3 (95% confidence interval [CI]: 7.0–7.6) and 4.3 (95% CI: 4.2–4.5) respectively per year for T1D and 19.3 (95% CI: 18.1–20.6) and 2.6 (95% CI: 2.4–2.8) for T2D, respectively. The highest rates of any hypoglycaemia were observed in Latin America for T1D and Russia for T2D. Glycaemic homogeneity (measured as a significant predictor of hypoglycaemia).

Conclusions: We report hypoglycaemia rates in a global population, including those in countries without previous data. Overall hypoglycaemia rates were high, with large variations between geographical regions. Future investigation into these differences may help to optimize therapy and reduce the risk of hypoglycaemia.

Keywords: Diabetes; global; HAT study; hypoglycaemia; insulin; observational

Data submitted 1 December 2015; Date of first decision 24 December 2015; Date of final acceptance 4 May 2016

Introduction

Insulin therapy is essential for the treatment of type 1 diabetes (T1D), and is often required for people with type 2 diabetes (T2D). Hypoglycaemia remains a limiting factor in

achieving good glycaemic control [1] and recent diabetes treatment guidelines highlight the need for personalized glycated haemoglobin (HbA1c) targets to balance reductions in hyperglycaemia with the potential risks of hypoglycaemia [2,3]. Previous studies in hypoglycaemia have been focused on the safety and efficacy of particular drugs [4–7]. Data regarding hypoglycaemia rates obtained from randomized controlled trials, as opposed to observational studies, must be interpreted with caution as these often exclude older patients, and those with recurrent hypoglycaemia, very poor glycaemic control, (HbA1c >10%), or concomitant medical conditions, even though these variables are often seen in the clinic. In addition,

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Diabetes Research and Clinical Practice

International Diabetes Federation

Direct and indirect health economic impact of hypoglycaemia in a global population of patients with insulin-treated diabetes

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Keywords: Medical economics; Type 1 diabetes; Type 2 diabetes; Insulin; Diabetes; Hypoglycaemia

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DOI 10.1007/s00125-017-4251-1

ARTICLE

Predicting hospital stay, mortality and readmission in people admitted for hypoglycaemia: prognostic models derivation and validation

Francesco Zaccaro¹, David R. Webb¹, Melanie J. Davies¹, Nafesa N. Dhalwani¹, Laura J. Gray¹, Sudana Chatterjee², Gemma Housley³, Dominick Shaw^{3,4}, James W. Flattin³, Kamlesh Khunti¹

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Abstract
Aims/Hypothesis: Hospital admissions for hypoglycaemia represent a significant burden on individuals with diabetes and have a substantial economic impact on healthcare systems. To date, no prognostic models have been developed to predict outcomes following admission for hypoglycaemia. We aimed to develop and validate prediction models to estimate risk of inpatient death, 24 h discharge and one month readmission in inpatient samples. C-indexes for the base and disease models, respectively, were 0.77 (95% CI 0.75, 0.80) and 0.78 (0.75, 0.80) for death, 0.57 (0.56, 0.59) and 0.57 (0.56, 0.58) for one month readmission, and 0.68 (0.67, 0.69) and 0.69 (0.68, 0.69) for 24 h discharge. Corresponding values in validation samples were: 0.74 (0.71, 0.76) and 0.74 (0.72, 0.77), 0.55 (0.54, 0.57) and 0.55 (0.53, 0.56), and 0.66 (0.65, 0.67) and 0.67 (0.66, 0.68). In both derivation and validation samples, calibration plots showed good agreement for the three outcomes. We developed a calculator of probabilities for inpatient death and 24 h discharge given the low performance of one month readmission models. **Conclusions/interpretation:** This simple and pragmatic tool to predict in-hospital death and 24 h discharge has the potential to reduce mortality and improve discharge in people admitted for hypoglycaemia.

Electronic supplementary material: The online version of this article (doi:10.1007/s00125-017-4251-1) contains peer-reviewed but unedited supplementary material, which is available to authorized users.

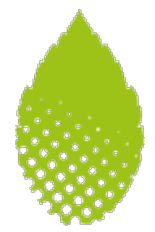
Keywords: Epidemiology; Hypoglycaemia; Inpatient; Mortality; Prognostic model

Abbreviations: HHS: Hospital Episode Statistics; IMD: Index of multiple deprivation; NHS: National Health Service

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Footnote: * Prof. Goldfracht study passed away before completion of this manuscript. E-mail address: margalit@chilth.co.uk
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Interventional studies: ADDITION, HOPE 3, Therapeutic studies

Webb et al. *Trials* 2010, **11**:16
http://www.trialsjournal.com/content/11/1/16

STUDY PROTOCOL Open Access

Rationale and design of the ADDITION-Leicester study, a systematic screening programme and Randomised Controlled Trial of multi-factorial cardiovascular risk intervention in people with Type 2 Diabetes Mellitus detected by screening

DR Webb^{1*}, K Khunti¹, B Srinivasan¹, LJ Gray², N Tabaq³, S Campbell⁴, J Barnett⁵, J Henson⁶, S Hiles⁷, A Farooq², SJ Griffin⁸, NI Wareham⁹, MJ Davies¹

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Abstract

Background: Earlier diagnosis followed by multi-factorial cardiovascular risk intervention may improve outcomes in Type 2 Diabetes Mellitus (T2DM). Latent phase identification through screening requires structured, appropriately targeted population-based approaches. Providers responsible for implementing screening policy await evidence of clinical and cost effectiveness from randomised intervention trials in screen-detected T2DM cases. UK South Asians are at particularly high risk of abnormal glucose tolerance and T2DM. To be effective national screening programmes must achieve good coverage across the population by and adapting to the delivery of earlier care. Here we describe the national community screening programme and randomised controlled trial of multifactorial setting (ADDITION-Leicester).

Design: A single-blind cluster randomised, parallel-group trial among comparing a protocol driven intensive multifactorial treatment with Methods: ADDITION-Leicester consists of community based screening practices coordinated from a single academic research centre. Screening repeated 75g Oral Glucose Tolerance Tests within an eligible non-diabetic years (25-75 years South Asian). Volunteers also provide detailed medical questionnaires, undergo anthropometric measures, lipid profiling and a p reduction in modelled Coronary Heart Disease (MPOD-CHD) risk at five year (original) volunteers over three years will be recruited to identify a screen-d detected a 6% relative difference (80% power, alpha 0.05) between treatment at practice level with newly diagnosed T2DM cases receiving either guidelines) or intensive algorithmic target-driven multifactorial cardiovascular. ADDITION-Leicester is the largest multifactorial targeting >30% vascular risk screening programme in the UK. By assessing feasibility and if disease prevention policy and contribute significantly to our understanding.

Trial registration: ClinicalTrials.gov (NCT00318032).

ORIGINAL ARTICLE

Cholesterol Lowering in Intermediate-Risk Persons without Cardiovascular Disease

S Yusuf, J Bosch, G Dagenais, J Zhu, D Xavier, L Liu, P Pais, P Lopez-Jaramillo, LA Leiter, A Dans, A Avramov, LS Pngas, A Parkhomov, K Kellor, M Kellor, R Khunti, WJ Toff, C.M. Reid, J Varigos, C Sanchez-Valero, R McKeive, J Pogue, H Jung, P Gao, R Diaz, and E. Lonn, for the HOPES-3 Investigators

BACKGROUND: Previous trials have shown that the use of statins to lower cholesterol reduces the risk of cardiovascular events among persons without cardiovascular disease. These trials have involved persons with elevated lipid levels or inflammatory markers and involved mainly white persons. It is unclear whether the benefits of statins can be extended to an intermediate-risk, ethnically diverse population without cardiovascular disease.

METHODS: In one comparison from a 2-by-2 factorial trial, we randomly assigned 12,705 participants in 21 countries who did not have cardiovascular disease and were at intermediate risk to receive rosuvastatin at a dose of 10 mg per day or placebo. The first copyrimary outcome was the composite of death from cardiovascular causes, nonfatal myocardial infarction, or nonfatal stroke, and the second copyrimary outcome additionally included revascularization, heart failure, and revascularized cardiac arrest. The median follow-up was 5.6 years.

RESULTS: The overall mean low-density lipoprotein cholesterol level was 26.5% lower in the rosuvastatin group than in the placebo group. The first copyrimary outcome was significantly lower in the rosuvastatin group and in 304 participants (4.8% in the placebo group [hazard ratio, 0.76; 95% confidence interval (CI), 0.64 to 0.91; P=0.002]. The results for the second copyrimary outcome were consistent with the results for the first (occurring in 277 participants (4.4% in the rosuvastatin group and in 363 participants (5.7% in the placebo group; hazard ratio, 0.75; 95% CI, 0.64 to 0.88; P=0.003). The benefits were also consistent in subgroups defined according to cardiovascular risk at baseline, lipid level, C-reactive protein level, blood pressure, and race or ethnic group. In the rosuvastatin group, there was no excess of diabetes or cancers, but there was an excess of statin surgery (in 3.8% of the participants, vs. 3.1% in the placebo group; P=0.02) and muscle symptoms (in 5.8% of the participants, vs. 4.7% in the placebo group; P=0.005).

CONCLUSIONS: Treatment with rosuvastatin at a dose of 10 mg per day resulted in a significantly lower risk of cardiovascular events than placebo in an intermediate-risk, ethnically diverse population without cardiovascular disease. (Funded by the Canadian Institutes of Health Research and AstraZeneca; HOPES-3 ClinicalTrials.gov number, NCT00468923).

ORIGINAL ARTICLE

Effect of early intensive multifactorial therapy on 5-year cardiovascular outcomes in individuals with type 2 diabetes detected by screening (ADDITION-Europe): a cluster-randomised trial

Sarraj Griffin, Kristi Borch-Johnsen, Melanie J Davies, Kamlesh Khunti, Guy EHM Ratten, Anwarul-Sarwar, Stephen J Sharp, Rebecca C Simmons, Mogens van den Borch, Nicholas Wareham, Tostin Lauritzen

BACKGROUND: Intensive treatment of multiple cardiovascular risk factors can have mortality among people with established type 2 diabetes. We investigated the effect of early multifactorial treatment after diagnosis by screening.

SUMMARY: Background: Intensive treatment of multiple cardiovascular risk factors can have mortality among people with established type 2 diabetes. We investigated the effect of early multifactorial treatment after diagnosis by screening.

RESULTS: In a pragmatic, cluster-randomised, parallel-group trial done in Denmark, the Netherlands, and the UK, 343 general practices were randomly assigned screening of registered patients aged 40–69 years without known diabetes followed by routine care or screening followed by intensive treatment of multiple risk factors. The primary endpoint was first cardiovascular event, including cardiovascular mortality and nonfatal, revascularisation, and non-traumatic amputation within 5 years. Patients and staff assessing outcomes were unaware of the practice's study group assignment. Analysis was done by intention to treat. This study is registered with ClinicalTrials.gov, number NCT00237549.

FINDINGS: Primary endpoint data were available for 8655 (99.9%) of 3057 screen-detected patients. The mean age was 66–3 (SD 10) years and the mean duration of follow-up was 5.3 (SD 1.4) years. Improvements in cardiovascular risk factors (HbA1c and cholesterol concentrations and blood pressure) were slightly but significantly better in the early intensive treatment group than in the routine care group (hazard ratio 0.83, 95% CI 0.72–0.95; P < 0.001).

CONCLUSIONS: Early intensive management of patients with type 2 diabetes was associated with a lower risk of cardiovascular events and death.

KEYWORDS: Danish Council for Strategic Research, Danish Research Foundation for Health and Health Technology Assessment, Danish National Board of Health, and University Research Foundation, Wellcome Trust, UK Medical Research Assessment Programme, UK National Health Service R&D, UK National Institute for Health Research, Danish Research Foundation for Health Research and Primary Care, University Medical Centre, Utrecht, Umeå, Servier, HemosCue, Merck.

ORIGINAL ARTICLE

Blood-Pressure Lowering in Intermediate-Risk Persons without Cardiovascular Disease

Eva M. Lonn, M.D., Jackie Bosch, Ph.D., Patricia López-Jaramillo, M.D., Ph.D., Jun Zhu, M.D., Lisheng Liu, M.D., Prem Pais, M.D., Rafael Diaz, M.D., Denis Xavier, M.D., Karen Silwa, M.D., Ph.D., Antonio Dans, M.D., Alvaro Avramov, M.D., Ph.D., Leopoldo S. Pngas, M.D., Ph.D., Katalin Kellai, M.D., Ph.D., Mayang Kellai, M.D., Ph.D., Irina Chazova, M.D., Ph.D., Ronj J.G. Peters, M.D., Ph.D., Claes Held, M.D., Ph.D., Khalid Yusuf, M.D., Basil S. Lewis, M.D., Petr Jansky, M.D., Alexander Parkhomov, M.D., Ph.D., Dora J. Molina, M.D., Robert McKeive, M.D., Ph.D., William D. Toff, M.D., Christopher M. Reid, Ph.D., John Varigos, B.Sc., Lawrence A. Leiter, M.D., Dora J. Molina, M.D., Robert McKeive, M.D., Ph.D., Janice Pogue, Ph.D., Joanne Wilkinson, B.A., Hyunjung Jung, M.Sc., Gilles Dagenais, M.D., and Salim Yusuf, M.B., B.S., D.Phil., for the HOPES-3 Investigators

BACKGROUND: Antihypertensive therapy reduces the risk of cardiovascular events among persons and among those with a systolic blood pressure of 160 mm Hg or higher but its role in persons at intermediate risk and with lower blood pressure is unclear.

OBJECTIVE: To assess the effect of blood-pressure lowering on cardiovascular outcomes in persons at intermediate risk and with lower blood pressure.

DESIGN: In one comparison from a 2-by-2 factorial trial, we randomly assigned participants at intermediate risk who did not have cardiovascular disease either candesartan at a dose of 16 mg per day plus hydrochlorothiazide of 12.5 mg per day or placebo. The first copyrimary outcome was the composite of death from cardiovascular causes, nonfatal myocardial infarction, or stroke; the second copyrimary outcome additionally included revascularized arrest, heart failure, and revascularization. The median follow-up was 5.2 years.

RESULTS: The mean blood pressure of the participants at baseline was 138.1/81.8 mm Hg, and the mean blood pressure was 6.0/3.0 mm Hg greater in the active-treatment than in the placebo group. The first copyrimary outcome occurred in 260 participants (4.9% in the active-treatment group and in 279 (4.4% in the placebo group; hazard ratio, 0.85; 95% confidence interval (CI), 0.79 to 0.90; P=0.004); the second copyrimary outcome occurred in 312 participants (4.9% and 328 participants (5.0% in the active-treatment group and in 328 participants (5.0% in the placebo group; hazard ratio, 0.95; 95% CI, 0.81 to 1.11; P=0.51). In one of two prespecified hypothesis-based subgroups, participants in the subgroup for third of systolic blood pressure (64.5 mm Hg who were in the active group had significantly lower rates of the first and second copyrimary outcomes than in the placebo group; effects were neutral in the middle and low (P=0.02 and P=0.005, respectively, for trend in the two outcomes).

CONCLUSIONS: Therapy with candesartan at a dose of 16 mg per day plus hydrochlorothiazide of 12.5 mg per day was not associated with a lower rate of major vascular events than placebo among persons at intermediate risk who did not have cardiovascular disease. (Funded by the Canadian Institutes of Health Research; AstraZeneca; ClinicalTrials.gov number, NCT00468923).

ORIGINAL ARTICLE

Statin Use in Primary Prevention: A Simple Trial-Based Approach Compared With Guideline-Recommended Risk Algorithms for Selection of Eligible Patients

Kamlesh Khunti, MD, PhD, Hyunjung Jung, MSc, Antonio L. Dans, MD, Claes Held, MD, PhD, Gilles R. Dagenais, MD, Salim Yusuf, MB, BS, DPhil, and Eva Lonn, MD, PhD

OBJECTIVE: The objective of the study was to compare outcomes using the American College of Cardiology/American Heart Association (ACC/AHA) risk algorithm and the Framingham Risk Score (FRS) tool to the Heart Outcomes Prevention Evaluation 3 (HOPE-3) study.

DESIGN: We compared outcomes using the ACC/AHA algorithm and the FRS with those seen in HOPE-3, which randomized participants to 10 mg rosuvastatin or placebo. The first copyrimary outcome was the composite of death from cardiovascular causes, nonfatal myocardial infarction, or nonfatal stroke; the second copyrimary outcome additionally included heart failure, cardiac arrest, and revascularization.

RESULTS: Relative risks using risk scores were similar to those observed in the HOPE-3. Hazard ratios for the first copyrimary outcome according to risk categories of < 10%, 10%–20%, and > 20% using the ACC/AHA algorithm were 0.82 (95% confidence interval [CI],

ORIGINAL ARTICLE

Blood-Pressure and Cholesterol Lowering in Persons without Cardiovascular Disease

Salim Yusuf, M.B., B.S., D.Phil., Eva Lonn, M.D., Prem Pais, M.D., Jackie Bosch, Ph.D., Patricia López-Jaramillo, M.D., Ph.D., Jun Zhu, M.D., Denis Xavier, M.D., Alvaro Avramov, M.D., Ph.D., Lawrence A. Leiter, M.D., Leopoldo S. Pngas, M.D., Ph.D., Alexander Parkhomov, M.D., Ph.D., Mayang Kellai, M.D., Ph.D., Katalin Kellai, M.D., Ph.D., Karen Silwa, M.D., Ph.D., Irina Chazova, M.D., Ph.D., Ronj J.G. Peters, M.D., Ph.D., Claes Held, M.D., Ph.D., Khalid Yusuf, M.D., Basil S. Lewis, M.D., Petr Jansky, M.D., Alexander Parkhomov, M.D., Ph.D., Dora J. Molina, M.D., Robert McKeive, M.D., Ph.D., William D. Toff, M.D., Christopher M. Reid, Ph.D., John Varigos, B.Sc., Jose L. Acosta, M.D., Robert McKeive, M.D., Ph.D., Janice Pogue, Ph.D., Hyunjung Jung, M.Sc., Lisheng Liu, M.D., Rafael Diaz, M.D., Antonio Dans, M.D., and Gilles Dagenais, M.D., for the HOPES-3 Investigators

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RESULTS: Relative risks using risk scores were similar to those observed in the HOPE-3. Hazard ratios for the first copyrimary outcome according to risk categories of < 10%, 10%–20%, and > 20% using the ACC/AHA algorithm were 0.82 (95% confidence interval [CI],

ORIGINAL ARTICLE

Statin Use in Primary Prevention: A Simple Trial-Based Approach Compared With Guideline-Recommended Risk Algorithms for Selection of Eligible Patients

Kamlesh Khunti, MD, PhD, Hyunjung Jung, MSc, Antonio L. Dans, MD, Claes Held, MD, PhD, Gilles R. Dagenais, MD, Salim Yusuf, MB, BS, DPhil, and Eva Lonn, MD, PhD

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ORIGINAL ARTICLE

Blood-Pressure and Cholesterol Lowering in Persons without Cardiovascular Disease

Salim Yusuf, M.B., B.S., D.Phil., Eva Lonn, M.D., Prem Pais, M.D., Jackie Bosch, Ph.D., Patricia López-Jaramillo, M.D., Ph.D., Jun Zhu, M.D., Denis Xavier, M.D., Alvaro Avramov, M.D., Ph.D., Lawrence A. Leiter, M.D., Leopoldo S. Pngas, M.D., Ph.D., Alexander Parkhomov, M.D., Ph.D., Mayang Kellai, M.D., Ph.D., Katalin Kellai, M.D., Ph.D., Karen Silwa, M.D., Ph.D., Irina Chazova, M.D., Ph.D., Ronj J.G. Peters, M.D., Ph.D., Claes Held, M.D., Ph.D., Khalid Yusuf, M.D., Basil S. Lewis, M.D., Petr Jansky, M.D., Alexander Parkhomov, M.D., Ph.D., Dora J. Molina, M.D., Robert McKeive, M.D., Ph.D., William D. Toff, M.D., Christopher M. Reid, Ph.D., John Varigos, B.Sc., Jose L. Acosta, M.D., Robert McKeive, M.D., Ph.D., Janice Pogue, Ph.D., Hyunjung Jung, M.Sc., Lisheng Liu, M.D., Rafael Diaz, M.D., Antonio Dans, M.D., and Gilles Dagenais, M.D., for the HOPES-3 Investigators

OBJECTIVE: The objective of the study was to compare outcomes using the American College of Cardiology/American Heart Association (ACC/AHA) risk algorithm and the Framingham Risk Score (FRS) tool to the Heart Outcomes Prevention Evaluation 3 (HOPE-3) study.

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COVID-19: Ethnic disparities, New onset diabetes, Long Covid & Recovery

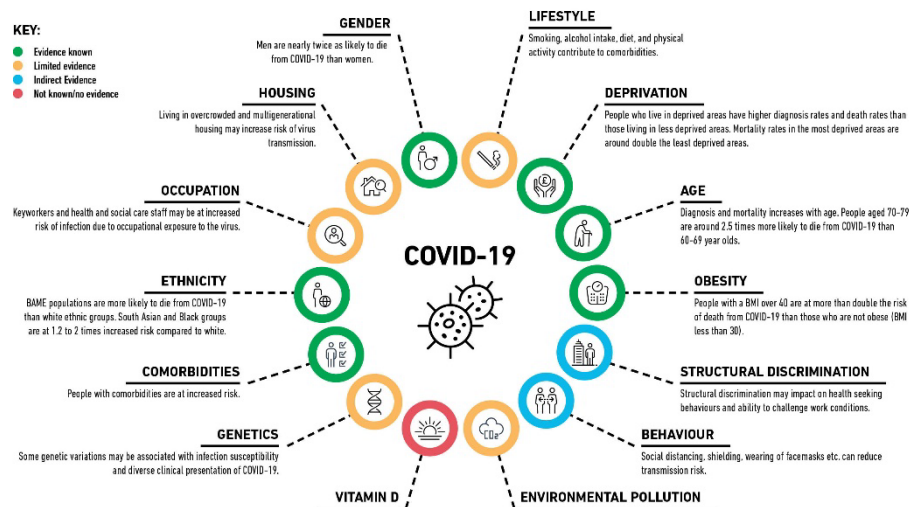


Kamlesh Khunti
@kamleshkhunti

Dear all - just had a message from a colleague that they are seeing many young south Asians being admitted with severe #COVID19 . Can people share their experiences quickly .

@docwas @parthaskar @mmamas1973 @singhak_endo
@AmarPut @AbdTahrani @ABCDiab @Paddy_English
@drpratkc

1:56 pm · 1 Apr 2020 · Twitter Web App



BMJ 2020;369:m1548 doi: 10.1136/bmj.m1548 (Published 20 April 2020)

Page 1 of 2

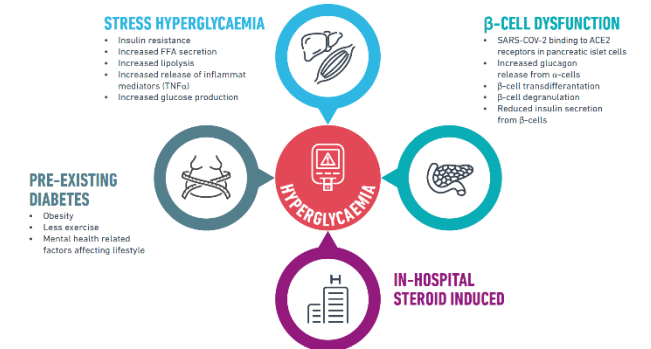


EDITORIALS

Is ethnicity linked to incidence or outcomes of covid-19?

Preliminary signals must be explored urgently

Kamlesh Khunti *professor of primary care diabetes and vascular medicine*¹, Awadhesh Kumar Singh *senior consultant*², Manish Pareek *associate clinical professor in infectious diseases*³, Wasim Hanif *professor of diabetes*⁴



Review within 3 months

Review within 12 months

HIGHER RISK ← → **LOWER RISK**

HbA1c	<8	7.5	>7
Blood Pressure	150/100	140/90	130/80
eGFR	<45		>60
BMI	>40	35	<30
Microvascular complications	+		-
Macrovascular complications	+		-
Ethnic minority population	+		-
Multi morbidity	+		-

Higher prioritisation for people with multiple risk factors



Use of established and novel therapies

Review



Use of Metformin and Cardiovascular Effects of New Classes of Glucose-Lowering Agents: A Meta-analysis of Cardiovascular Outcome Trials in Type 2 Diabetes

Diabetes Care 2021;44:e32–e34 | <https://doi.org/10.2337/dc20-2080>

Francesco Zaccardi,^{1,2}
David E. Kloecker,^{1,2} John B. Buse,³
Chantal Mathieu,⁴ Kamlesh Khunti,^{1,2}
and Melanie J. Davies^{2,5}

Over the last two decades, the large, overcoming this problem and identifying RCTs (3). We used Stata version 16.0 for

Khunti et al. *Cardiovasc Diabetol* (2021) 20:159
<https://doi.org/10.1186/s12933-021-01345-z>

Cardiovascular Diabetology

ORIGINAL INVESTIGATION

Open Access

Cardiovascular outcomes with sodium–glucose cotransporter-2 inhibitors vs other glucose-lowering drugs in 13 countries across three continents: analysis of CVD-REAL data

Kamlesh Khunti^{1*}, Mikhail Kosiborod^{2,3,4}, Dae Jung Kim⁵, Shun Kohsaka⁶, Carolyn S. P. Lam^{7,8,9}, Su-Yen Goh¹⁰, Chern-En Chiang^{11,12}, Jonathan E. Shaw¹³, Matthew A. Cavender¹⁴, Navdeep Tangri¹⁵, Josep Franch-Nadal¹⁶, Reinhard W. Holl¹⁷, Marit E. Jørgensen^{18,19}, Anna Norhammar²⁰, Johan G. Eriksson^{21,22,23}, Francesco Zaccardi¹, Avraham Karasik²⁴, Dianna J. Magliano²⁵, Marcus Thuresson²⁶, Hungta Chen²⁷, Eric Wittbrodt²⁸, Johan Bodegård²⁹, Filip Surmont³⁰ and Peter Fenici³¹ on behalf of the CVD-REAL Investigators and Study Group



Do sulphonylureas still have a place in clinical practice?

Kamlesh Khunti, Sudesna Chatterjee, Hertz C Gerstein, Sophia Zoungas, Melanie J Davies

Sulphonylureas have been commercially available since the 1950s, but their use continues to be associated with controversy. Although adverse cardiovascular outcomes in some observational studies have raised concerns about sulphonylureas, findings from relatively recent, robust, and high-quality systematic reviews have indicated no increased risk of all-cause mortality associated with sulphonylureas compared with other active treatments. Results from large, multicentre, randomised controlled trials such as the UK Prospective Diabetes Study and ADVANCE have confirmed the microvascular benefits of sulphonylureas, a reduction in the incidence or worsening of nephropathy and retinopathy, and no increase in all-cause mortality, although whether these benefits were due to sulphonylurea therapy and not an overall glucose-lowering effect could not be confirmed. A comparison of sulphonylureas and pioglitazone in the TOSCA.IT trial also confirmed the efficacy and cardiovascular safety of sulphonylureas. Investigators of randomised controlled trials have reported an increased risk of hypoglycaemia and weight gain with sulphonylureas, but data from observational studies suggest that the incidence of severe hypoglycaemia is lower in people taking sulphonylurea than in people taking insulin, and weight gain with sulphonylureas has been relatively modest in large cohort studies. 80% of people with diabetes live in low-to-middle income countries, so the effectiveness, affordability, and safety of sulphonylureas are particularly important considerations when prescribing glucose-lowering therapy. Results of ongoing head-to-head studies with new drugs, such as the comparison of glimepiride with linagliptin in the CAROLINA study and the comparison of various therapies (including sulphonylureas) for glycaemic control in the GRADE study, will determine the place of sulphonylureas in glucose-lowering therapy algorithms for patients with type 2 diabetes.

Introduction

Prescription of glucose-lowering therapies and risk of COVID-19 mortality in people with type 2 diabetes: a nationwide observational study in England

Kamlesh Khunti, Peter Knighton, Francesco Zaccardi, Chirag Bakhai, Emma Barron, Naomi Holman, Partha Kar, Claire Meace, Naveed Sattar, Stephen Sharp, Nicholas J Wareham, Andy Weaver, Emilia Woch, Bob Young, Jonathan Valabhji

Summary

Background In patients with type 2 diabetes, hyperglycaemia is an independent risk factor for COVID-19-related mortality. Associations between pre-infection prescription for glucose-lowering drugs and COVID-19-related mortality in people with type 2 diabetes have been postulated but only investigated in small studies and limited to a few agents. We investigated whether there are associations between prescription of different classes of glucose-lowering drugs and risk of COVID-19-related mortality in people with type 2 diabetes.

Methods This was a nationwide observational cohort study done with data from the National Diabetes Audit for people with type 2 diabetes and registered with a general practice in England since 2003. Cox regression was used to estimate the hazard ratio (HR) of COVID-19-related mortality in people prescribed each class of glucose-lowering drug, with covariate adjustment with a propensity score to address confounding by demographic, socioeconomic, and clinical factors.



Lancet Diabetes Endocrinol 2018
February 28, 2018
[http://dx.doi.org/10.1016/S2213-8587\(18\)30025-1](http://dx.doi.org/10.1016/S2213-8587(18)30025-1)
Diabetes Research Centre, University of Leicester, Leicester General Hospital, Leicester, UK (Prof K Khunti PhD, S Chatterjee MD, Prof M J Davies MD); Population Health Research Institute, McMaster University, ON, Canada (Prof H C Gerstein MD); Thrombosis and Atherosclerosis Research Institute, Hamilton Health Sciences, McMaster University, ON, Canada (Prof H C Gerstein); Division of Metabolism, Ageing and Genomics, School of Public Health and Preventive



Lancet Diabetes Endocrinol 2021;
9: 293–303
Published Online
March 30, 2021
[https://doi.org/10.1016/S2213-8587\(21\)00050-4](https://doi.org/10.1016/S2213-8587(21)00050-4)
See Comment page 251
National Diabetes Audit Programme, NHS England & Improvement, London, UK (Prof K Khunti FMedSci, P Knighton MPhy, N Holman PhD, Prof P Kar MD,

Barriers to Therapies: T1DM and T2DM and HCPs

DIABETICMedicine
DOI: 10.1111/d.1464-5491.2012.03669.x

Research: Care Delivery

Insulin initiation and management in people with Type 2 diabetes in an ethnically diverse population: the healthcare provider perspective

N. Patel¹, M. A. Stone¹, A. Chauhan¹, M. J. Davies² and K. Khunti¹

¹Department of Health Sciences, University of Leicester and ²Department of Cardiovascular Sciences, University of Leicester and University Hospitals of Leicester NHS Trust, Leicester, UK

Accepted 30 March 2012

Abstract

Aim To explore barriers to prescribing of insulin, particularly delays in initiation, from the perspective of healthcare professionals involved in managing Type 2 diabetes in a multi-ethnic setting.

Methods The study was carried out in a UK population with high numbers of people of South Asian (mainly Indian) origin. Semi-structured interviews were conducted with 14 healthcare professionals from primary and secondary care. Analysis involved exploring interview transcripts in terms of themes and sub-themes identified through a process of progressive focusing.

Results Initiation of insulin therapy was described as challenging in all patients irrespective of ethnicity, but some barriers were perceived to be accentuated because of language needs and lower levels of understanding about diabetes and insulin. Additionally, some South Asians were viewed as more likely than their white European counterparts to be influenced by negative observations and experiences about insulin therapy within community networks. Time restrictions were seen as a barrier that was accentuated in the management of South Asian patients. Participants suggested strategies for overcoming patient barriers; with South Asians these included involvement of families and patient peers and availability of South Asian healthcare providers.

Conclusion The challenge for healthcare providers is to how to address the tension between the optimal clinical time for commencing insulin therapy and the time when the patient feels psychologically ready. To help make these two time points coincide, our findings suggest the need to adopt a holistic approach involving consideration of the cultural context of patients, including their ethnic background.

Diabet. Med. 29, 1311–1316 (2012)

Introduction

The timely introduction of insulin in Type 2 diabetes can improve glycaemic control and help to delay or reduce microvascular complication [1]. Despite this evidence, under-prescribing of insulin, including delayed initiation, has been highlighted [2]. Whilst this is an important issue for all people with Type 2 diabetes, under-prescribing of insulin can be perceived as particularly salient in relation to people from South Asian backgrounds in the UK, in whom the prevalence of Type 2 diabetes is substantially increased compared with people of white European origin [3]. In addition, earlier development of both micro- and macro-vascular complications in South Asians has been demonstrated [4], leading to higher mortality rates [5,6] than found in white Europeans. A study of an ethnically diverse population in London identified lower rates of prescribing of insulin in people of South Asian origin with diabetes compared with their white British and Irish counterparts [7]. A trial of enhanced care in a South Asian population with diabetes in Coventry and Birmingham also recorded only a small increase in the percentage of people prescribed insulin in both groups (intervention and control) over the study period [8].

A concept termed 'psychological insulin resistance' has been described as encompassing a range of multifactorial psychosocial issues that are sometimes interrelated [9,10], for example, a sense of personal failure arising from patients' perceived

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Diversity in Health and Care 2011;8:217–23 © 2011 Radcliffe Publishing

Research paper

Disclosure of type 1 diabetes status: a qualitative study in a mixed South Asian population in central England

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Research Associate

Helen Eborall BSc MSc PhD
Lecturer in Social Science Applied to Health

Kamlesh Khunti MB ChB PhD MD FRCPG DCH DRCOG
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Honorary Consultant, University Hospitals of Leicester NHS Trust, Leicester, UK

Margaret A Stone BA (Hons) PhD
Senior Research Fellow, Department of Health Sciences, University of Leicester, Leicester, UK

What is known on this subject

- The incidence of type 1 diabetes in the South Asian population in the UK is increasing.
- There is a paucity of research on the attitudes and beliefs that influence and affect self-management of this condition in the South Asian population.

What this paper adds

- For pragmatic reasons, people with type 1 diabetes are generally willing to disclose their need for insulin. However, in some people of South Asian origin, there may be an exception regarding disclosure where marriage prospects are an issue.
- Those involved in diabetes management need to be aware of the social and cultural context of patients. For South Asian patients, this may include awareness of issues such as marriage prospects which may have an impact on physiological and psychological well-being.

ABSTRACT

The findings presented in this paper are drawn from a qualitative study which used in-depth interviews, facilitated by a flexible topic guide, to explore the attitudes and experiences of insulin initiation and management in a multi-ethnic population with type 1 diabetes. The 15 South Asian adults who participated were recruited, using purposive sampling, through specialist care clinics in Leicester, UK. Progressive focusing was used to identify key themes for further exploration and interpretation of the data. This paper focuses on a major theme regarding disclosure of diabetes status. Some of those interviewed described experiencing and observing negative perceptions and views about diabetes and the use of insulin. These perceptions did not deter participants from revealing their diabetes in certain situations. Disclosure of diabetes was seen as beneficial in terms of work and social occasions at which they would need to inject, and in terms of ensuring that they would receive insulin during hypoglycaemic

Research: Educational and Psychological Issues

Concerns and perceptions about necessity in relation to insulin therapy in an ethnically diverse UK population with Type 2 diabetes: a qualitative study focusing mainly on people of South Asian origin

N. Patel¹, M. A. Stone¹, C. McDonough², M. J. Davies³, K. Khunti^{1,4} and H. Eborall²

¹Diabetes Research Centre, ²Department of Health Science, ³Diabetes Research Centre, Department of Cardiovascular Sciences, University of Leicester and ⁴NIBIR Leicester-Loughborough Biomedical Research Unit, Leicester, UK

Accepted 25 November 2014

Aim

To explore attitudes towards insulin acceptance an ethnically diverse population of people with Type 2 diabetes.

Methods

We conducted semi-structured interviews using a topic guide based on a literature review and findings from our previous study, which explored the perspectives of healthcare professionals about insulin initiation and management. Analysis of data involved undertaking an abductive reasoning approach in response to emerging themes.

Results

Participants discussed not only their concerns about insulin therapy, but also their views and beliefs about the necessity of insulin. Their attitudes to insulin treatment could be mapped into four main typologies. These fitted with an attitudinal scale based on the Necessity-Concerns Framework described in the medication adherence literature, comprising four attitudes: accepting, sceptical, ambivalent and indifferent. Decisions about accepting insulin involved balancing concerns (such as needle size) against the perceived necessity of insulin (generally, inadequacy of oral medication). The South Asian and white participants had similar concerns, but these were sometimes greater in South Asian participants, because of the influence of negative views and experiences of other insulin users.

Conclusions

When discussing insulin with people with Type 2 diabetes, healthcare providers need to ensure that they explore and contribute to patients' understanding and interpretation of the necessity of insulin as well as discussing their concerns. Furthermore, they should be aware of how an individual's social context can influence his/her perceptions about the necessity of insulin as well as their concerns, and that this influence may be greater in some South Asian populations.

Diabet. Med. 32, 635–644 (2015)

Introduction

Approximately 50% of people with Type 2 diabetes will at some point need to commence insulin therapy to achieve or maintain good levels of blood glucose control [1]. Good glycaemic control can help to reduce or prevent the development of diabetes-associated complications as shown by the 10-year post-trial follow-up data from the UK Prospective Diabetes Study [2]. This showed that good glycaemic control continued to confer benefits; in the sulfonylurea-insulin group, for example, there were relative reductions of 13 and 24% in the risk of diabetes-related death and microvascular complications, respectively. Additionally, research modelling has shown that if insulin is commenced according to management guidelines there are benefits relating to life expectancy and quality-adjusted life expectancy [3]. However, the transition to this treatment can be challenging for some healthcare professionals and patients, often resulting in people with diabetes not accepting insulin therapy. In the UK, evidence indicates that some people with diabetes remain on oral hypoglycaemic agents for a median time of 7.7 years, despite having poor glycaemic control [4,5]. Furthermore, there is also evidence [6,7] of lower rates of prescribing of insulin for people with Type 2 diabetes in South Asian populations than for the white British population in the UK. Whilst not much is known from a South Asian perspective about the reasons for lower levels of prescribing insulin, our previous study of healthcare professionals' views and experiences found that patient-related barriers to insulin prescribing are perceived to be accentuated

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Ramadan

original article

Safety and effectiveness of non-insulin glucose-lowering agents in the treatment of people with type 2 diabetes who observe Ramadan: a systematic review and meta-analysis

L. J. Gray¹, J. Dales², E. M. Brady³, K. Khunti^{2,3}, W. Hanif⁴ & M. J. Davies^{2,3}

¹Department of Health Sciences, University of Leicester, Leicester, UK
²Diabetes Research Centre, University of Leicester, Leicester, UK
³Leicester Diabetes Centre, University Hospitals of Leicester, Leicester, UK
⁴Department of Diabetes & Endocrinology, University Hospital Birmingham, NHS Trust, Birmingham, UK

Aim: To determine which non-insulin glucose-lowering treatment regimens are most appropriate in people with type 2 diabetes who choose to fast during Ramadan.

Methods: Electronic databases were searched for randomized controlled trials (RCTs) and observational studies that compared non-insulin glucose-lowering agents in people with type 2 diabetes fasting during Ramadan. Those studies which reported hypoglycaemia, weight and glycated haemoglobin (HbA1c) change were included. Data were pooled using random effects models.

Results: A total of 16 studies were included: 9 RCTs and 7 observational studies. There was evidence that dipeptidyl peptidase-4 (DPP-4) inhibitors led to fewer hypoglycaemic events compared with sulphonylureas. Sitagliptin significantly reduced the number of patients with ≥ 1 hypoglycaemic episodes during Ramadan [risk ratio (RR) 0.48, 95% confidence interval (CI) 0.36, 0.64; $p < 0.0001$]. This was not replicated in the RCTs of vildagliptin, but a significant reduction was found in the observational studies (RR 0.28, 95% CI 0.10, 0.75; $p = 0.01$) with high heterogeneity ($I^2 = 86.7\%$). Significant reductions in HbA1c and weight were seen in the observational studies of sitagliptin versus sulphonylureas. The use of liraglutide led to significant weight loss (-1.81 kg, 95% CI -2.31 , -0.71 ; $p = 0.001$) compared with sulphonylureas. Floglitazone significantly increased weight compared with placebo (3.48 kg, 95% CI 2.82, 4.14; $p < 0.0001$).

Conclusions: The analysis supports the use of DPP-4 inhibitors during Ramadan rather than sulphonylureas for reduction in hypoglycaemia without a cost to diabetes control and weight. The glucagon-like peptide (GLP-1) agonist liraglutide provides clinical benefits, but more studies are required. RCTs of DPP-4 inhibitors compared with GLP-1 agonists and novel therapies including the sodium-glucose co-transporter 2 and α -glucosidase inhibitors are needed to inform evidence-based guidelines.

Keywords: DPP-4 inhibitor, GLP-1 analogue, meta-analysis, sulphonylureas, systematic review, type 2 diabetes

Date submitted 15 January 2015; date of first decision 7 February 2015; date of final acceptance 12 March 2015

Introduction

There are over 1.6 billion Muslims worldwide, constituting 23% of the total global population [1]. Ramadan is one of the five pillars of the Islamic faith and represents a significant cultural, religious and social identifier for many Muslims [2]. The majority of Muslims participate in this holy month. Observance of Ramadan requires fasting from dawn to sunset. Abstaining from eating and drinking during daylight hours, most Muslims will consume two meals each day [2]. The timing of Ramadan follows the lunar calendar; therefore, the length of the fast varies depending on the time of year and the geographical location [2], but is usually between 10 and 20 h.

The Quran exempts 'sick' people from fasting, including pregnant, lactating or menstruating women, elderly people and those with a chronic illness [2]. Concern for Muslims with

diabetes during Ramadan has been recognized by religious leaders and an agreement was signed between the two leading bodies, the Islamic Organisation for Medical Sciences and the International Islamic Fiqh Academy [3] with the aim of helping individuals to make informed decisions about fasting during Ramadan with support from their physicians [4]. Many Muslims with diabetes, however, do not consider themselves to be sick and are eager to fast. The EPIDIAR study [2] identified that 43% of people with type 1 diabetes and 79% of people with type 2 diabetes (T2DM) fasted for at least 15 days during Ramadan. Globally, it is estimated that 50 million Muslims with T2DM fast during Ramadan [5]; however, the proportion of those with T2DM who observe Ramadan varies considerably, with a rate of 58–90% amongst different Islamic countries [2].

The associated risks of fasting by people with diabetes include hypoglycaemia, hyperglycaemia, diabetic ketoacidosis, venous thromboembolism and dehydration. The EPIDIAR study highlighted an increased risk of severe hypoglycaemia in people with T2DM fasting during Ramadan compared with

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original article

A randomized controlled trial comparing the GLP-1 receptor agonist liraglutide to a sulphonylurea as add on to metformin in patients with established type 2 diabetes during Ramadan: the Treat 4 Ramadan Trial

E. M. Brady^{1,†}, M. J. Davies^{1,2,3,†}, L. J. Gray^{1,3,4}, M. A. Saeed⁵, D. Smith⁵, W. Hanif⁶ & K. Khunti^{1,2,3}

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Aims: To compare a sulphonylurea with the glucagon like peptide-1 (GLP-1) receptor agonist liraglutide in combination with metformin in patients on mono/dual oral therapy with established type 2 diabetes fasting during Ramadan.

Methods: Ninety-nine adults intending to fast during Ramadan (50% male, mean age 52 years, body mass index (BMI) 32 kg/m²) were randomized from two UK sites. Baseline data were collected ≤ 14 days prior to Ramadan and at 3 and 12 weeks after Ramadan.

Results: At 12 weeks, more patients in the liraglutide compared with the sulphonylurea group achieved a composite endpoint of haemoglobin A1c (HbA1c) $< 7\%$, no weight gain and no severe hypoglycaemia but this did not reach statistical significance [odds ratio (OR) 4.08, 95% confidence interval (CI) 0.97, 17.22; $p = 0.06$]. From a baseline of 7.7% there was no change in HbA1c at 12 weeks in the sulphonylurea ($+0.02\%$) compared with a 0.3% reduction in the liraglutide group (adjusted coefficient -0.41 , 95% CI -0.83 , 0.01, $p = 0.05$). Significant reductions were also observed in weight and diastolic blood pressure (BP) in the liraglutide compared with the sulphonylurea group. Treatment satisfaction was comparable across the treatment groups. There were no episodes of severe hypoglycaemia in either group; however, self-recorded episodes of blood glucose ≤ 3.9 mmol/l were significantly lower with liraglutide (incidence rate ratio 0.29, 95% CI 0.19, 0.41, $p < 0.0001$).

Conclusions: Liraglutide compared with sulphonylurea is well tolerated and maybe an effective therapy in combination with metformin during Ramadan with more patients able to achieve target HbA1c, lose or maintain weight with no severe hypoglycaemia. This was achieved with a high level of treatment satisfaction.

Keywords: GLP-1 analogue, randomized trial, type 2 diabetes

Date submitted 15 October 2013; date of first decision 18 November 2013; date of final acceptance 12 December 2013

Introduction

Globally there are more than 1.6 billion Muslims [1]. Most Muslims fast during the month of Ramadan; this involves abstinence from all food and drinks between pre-sunrise and -sunset. Muslims follow the lunar calendar which falls short by 11 days every year compared with the Gregorian calendar hence the month of Ramadan can occur in both summer and winter and this has an effect on the duration of the fast.

The prevalence of diabetes in countries with large Muslim populations is similar to westernized countries, with increases of 10% annually as a result of urbanization and socioeconomic

development [2]. Although the Quran exempts 'sick' people from the duty of fasting [3] a study conducted in Muslim populations from 13 countries found that 43% of patients with type 1 diabetes (T1DM) and 79% of people with type 2 diabetes (T2DM) chose to fast [4]. This study reported a 7.5-fold increased risk of severe hypoglycaemia (defined as requiring hospitalization) in those with T2DM who observed Ramadan compared with the preceding months [4]. This is supported by another study which reported the incidence of symptomatic hypoglycaemia to be as high as 20% during Ramadan in those with T2DM taking a sulphonylurea [5].

Following lifestyle modification, people with T2DM often receive metformin as a first line pharmacological therapy for the management of hyperglycaemia. However, the natural history of T2DM means that the majority of patients will require the use of combination antihyperglycaemic agents and for many this will include insulin therapy. The type and/or combination of

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[†]These authors contributed equally.

Review Article

Guidelines for managing diabetes in Ramadan

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Accepted 19 January 2016

Abstract

Background: Globally there are approximately 90 million Muslims with diabetes of which approximately 400 000 reside within the UK. The holy month of Ramadan is a fundamental practice of this religion of which fasting from sunrise to sunset is an integral part. This poses many potential risks for those with diabetes who wish to observe Ramadan.

Methods: The evidence base for best clinical management of Type 1 and Type 2 diabetes during Ramadan was reviewed. The evidence current and previous recommendations for safe fasting during Ramadan.

Results: The risks associated with fasting in those with diabetes and preparing your patient for Ramadan are discussed. We have reviewed the evidence around diet-controlled diabetes and therapies including: metformin, acarbose, metglitinides, sulphonylureas, thiazolidinediones, dipeptidyl peptidase-4 inhibitor (DPP-4), sodium glucose co-transporter 2 (SGLT-2) inhibitors, glucagon-like peptide -1 (GLP-1) receptor agonists and insulin.

Conclusion: Up to date guidelines for the management of treatment regimens are set-out for those with Type 1 and Type 2 diabetes who wish to fast during Ramadan.

Diabet. Med. 33, 1315–1329 (2016)

Introduction

Religious identity can significantly influence the daily practices of individuals, thus impacting on their health. In 2010, a demographic study showed that Muslims constitute 23% of the world's population, some 1.6 billion people; this number is increasing at a rate of ~ 3% each year [1]. The International Diabetes Federation estimates that in 2013 there were 382 million people living with diabetes, a number predicted to rise to 592 million by 2035. If these figures are extrapolated globally there are ~ 90 million Muslims with diabetes. Considering specifically the UK, the current number of patients with diabetes is estimated at just fewer than 3 million [2]. Diabetes affects around 10–15% of the UK Muslim population, with South Asian people having the highest rates of diabetes mellitus [3]. Recent data suggest that there are ~ 2.9 million Muslims living in the UK [4], thus ~ 400 000 British Muslims have diabetes [3].

The holy month of Ramadan forms one of the five pillars of the Muslim faith, with fasting obligatory during

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this month with some exceptions. The holy Qur'an clarifies that people with illness are exempt from fasting [5]. However, most Muslims with diabetes often do not consider themselves unwell and exempted, and are therefore keen to fast. The most extensive study to date investigating the effects of fasting in Muslim patients with diabetes is the Epidemiology of Diabetes and Ramadan (EPIDIAR) study, performed across 13 countries and involving ~ 13 000 patients. The EPIDIAR study reported that 43% of patients with Type 1 diabetes and 79% with Type 2 diabetes fast, irrespective of the advice given to them [6].

Furthermore, ~ 80% of Muslims with diabetes fast for at least 15 days [6]. Extrapolating these figures suggests that ~ 320 000 Muslims with diabetes in the UK and > 5 million Muslims globally with diabetes will fast for at least half of Ramadan [7].

Fasting in Ramadan

Fasting in Ramadan forms one of the five mandatory acts of faith in Islam. The month of Ramadan lasts 29–30 days and Muslims must abstain from eating and drinking during the



Social determinants

Prescription of glucose-lowering therapies and risk of COVID-19 mortality in people with type 2 diabetes: a nationwide observational study in England

Kamlesh Khunti, Peter Knighton, Francesco Zaccardi, Chirag Bakhai, Emma Barron, Naomi Holman, Partha Kar, Claire Meace, Naveed Sattar, Stephen Sharp, Nicholas J Wareham, Andy Weaver, Emilia Woch, Bob Young, Jonathan Valabhji

Summary

Background In patients with type 2 diabetes, hyperglycaemia is an independent risk factor for COVID-19-related mortality. Associations between pre-infection prescription for glucose-lowering drugs and COVID-19-related mortality in people with type 2 diabetes have been postulated but only investigated in small studies and limited to a few agents. We investigated whether there are associations between prescription of different classes of glucose-lowering drugs and risk of COVID-19-related mortality in people with type 2 diabetes.

Methods This was a nationwide observational cohort study done with data from the National Diabetes Audit for people with type 2 diabetes and registered with a general practice in England since 2003. Cox regression was used to estimate the hazard ratio (HR) of COVID-19-related mortality in people prescribed each class of glucose-lowering drug, with covariate adjustment with a propensity score to address confounding by demographic, socioeconomic, and clinical factors.



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See [Comment](#) page 251

National Diabetes Audit Programme, NHS England & Improvement, London, UK (Prof K Khunti FMedSci, P Knighton MPhys, N Holman PhD, Prof P Kar MD,

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ORIGINAL ARTICLE

WILEY

Ethnic and socioeconomic disparities in initiation of second-line antidiabetic treatment for people with type 2 diabetes in England: A cross-sectional study

Patrick Bidulka MSc¹ | Rohini Mathur PhD¹ | David G. Lugo-Palacios PhD² | Stephen O'Neill PhD² | Anirban Basu PhD³ | Richard J. Silverwood PhD⁴ | Paul Charlton MA⁵ | Andrew Briggs DPhil² | Liam Smeeth MBChB¹ | Amanda I. Adler MD⁶ | Ian J. Douglas PhD¹ | Kamlesh Khunti MD⁷ | Richard Grieve PhD²

Diabetes prevalence, process of care and outcomes in relation to practice size, caseload and deprivation: national cross-sectional study in primary care

Christopher Millett¹ Josip Car² Darren Eldred⁴
Kamlesh Khunti⁵ Arch G Mainous III⁶ Azeem Majeed³

J R Soc Med 2007;100:275–283



Cardiometabolic & microvascular complications

Joint Prevalence of Diabetes, Impaired Glucose Regulation, Cardiovascular Disease Risk and Chronic Kidney Disease in South Asians and White Europeans

Kamlesh Khunti¹, Danielle H. Morris², Claire L. Weston¹, Laura A. Gray³, David R. Webb¹, Melanie J. Davies¹

Abstract

Background Multiple vascular risk factors may confer very high risk, but the degree of commonality between risk factors is unclear, particularly among ethnic minorities. Furthermore, it is unclear what impact this commonality will have on the UK-based NHS Health Check Programme, a vascular disease prevention programme that screens individuals aged 40-74 years. We estimated the joint prevalence of diabetes, impaired glucose regulation (IGR), high cardiovascular disease (CVD) risk and chronic kidney disease (CKD) among White Europeans and South Asians who would be eligible for the Programme.

Methods Cross-sectional data were analysed for 3707 participants (23.6% South Asian) in a screening study set in Lancashire, UK. Diabetes and IGR were screened previously. IGR was defined as impaired fasting glucose and/or impaired glucose tolerance and high CVD risk as 10 year risk greater than 20%.

Results Among males, South Asians had higher prevalence than White Europeans of diabetes (20% vs. 3%, respectively, $p < 0.001$), IGR (12.2% vs. 12.2% vs. 0.5%), and high CVD risk (39.7% vs. 33.3% vs. 0.03), but lower prevalence of CKD (1.7% vs. 4.6%, $p < 0.01$). Among females, South Asians had higher prevalence than White Europeans of diabetes (7.4% vs. 3.3%, $p < 0.001$), but lower prevalence of CKD (3.7% vs. 13.0%, $p < 0.001$) and CVD risk (24.6% vs. 40%, $p < 0.01$), and a non-significant difference in IGR prevalence. At least one risk factor was diagnosed in 34% of participants, and of all of them in 64%, suggesting that 72.8% (74,539) men and 64% (66,539) women would be eligible for the Programme.

Conclusions The collective prevalence of risk factors for vascular disease in this population was high, but there was little overlap between the risk factors, and prevalence differed by ethnicity. This has implications for service delivery and resources, and should be considered when planning screening and intervention programmes.

Conclusion The collective prevalence of risk factors for vascular disease in this population was high, but there was little overlap between the risk factors, and prevalence differed by ethnicity. This has implications for service delivery and resources, and should be considered when planning screening and intervention programmes.

Introduction

While the cumulative atherogenic effect of vascular risk factor clustering is well recognized, the degree of commonality of individual components within large populations, in low, intermediate and high risk ethnic populations, despite the well-established association between ethnicity and vascular disease. This is important because it may identify different groups of people at increased risk, facilitate identification of groups at very high risk, and inform efficiency by making targeted screening. With earlier identification of vascular risk there is more to be gained.

Prevalence and progression of diabetic nephropathy in South Asian, white European and African Caribbean people with type 2 diabetes: A systematic review and meta-analysis

Chandni Jadavji MBChB^{1,2} | Winston Crasto MD³ | Clare Giles PhD^{2,3} | Debashish Kar MSc^{1,2} | Melanie J. Davies MD^{2,3} | Kamlesh Khunti MD^{1,2} | Samuel Seidu MD^{1,2}

Abstract

Aims To conduct a systematic review and meta-analysis of published observational evidence to assess the difference in the prevalence and progression of diabetic nephropathy, and the development of end-stage renal disease (ESRD) in people from three different ethnic groups with type 2 diabetes (T2DM).

Methods and results Relevant studies were identified in a literature search of MEDLINE, EMBASE and reference lists of relevant studies published up to May 2018. We decided a priori that there were no differences in the prevalence and progression of diabetic nephropathy, and the development of ESRD in the three ethnicities with T2DM. Pooled relative risks of microalbuminuria by ethnicity were estimated by fitting three random effects meta-analytic models. A narrative synthesis of the nephropathy progression in the studies was carried out. The review was registered in PROSPERO (CRD42018077350).

Results Thirty-two studies with data on 553 827 unique participants were eligible for inclusion in the review. The pooled prevalence ratio of microalbuminuria in South Asian compared with white-European participants was 1.14 (95% confidence interval (CI) 0.99, 1.32, $P = 0.06$), while for African Caribbean vs South Asian participants the pooled prevalence ratio was 1.08 (95% CI 0.93, 1.24, $P = 0.32$). Results for renal decline were inconsistent, with progression towards a high rate of disease progression in South Asian compared with white participants. The adjusted pooled incidence rate ratio (IRR) for ESRD was significantly higher in African Caribbean vs white European participants: 2.75 (95% CI 2.01, 3.68, $P < 0.001$).

Conclusions The results of this review did not show a significant link between ethnicity (South Asian, white European and African Caribbean) and the prevalence of microalbuminuria. However, the IRR for ESRD in African Caribbean compared with white European participants was significantly higher. Further research is needed to explore the potential non-therapeutic pathways of progression to ESRD.

Journal of Human Hypertension

Original Article | Published: 14 August 2014

Association between undiagnosed hypertension and microalbuminuria in South Asians without known diabetes

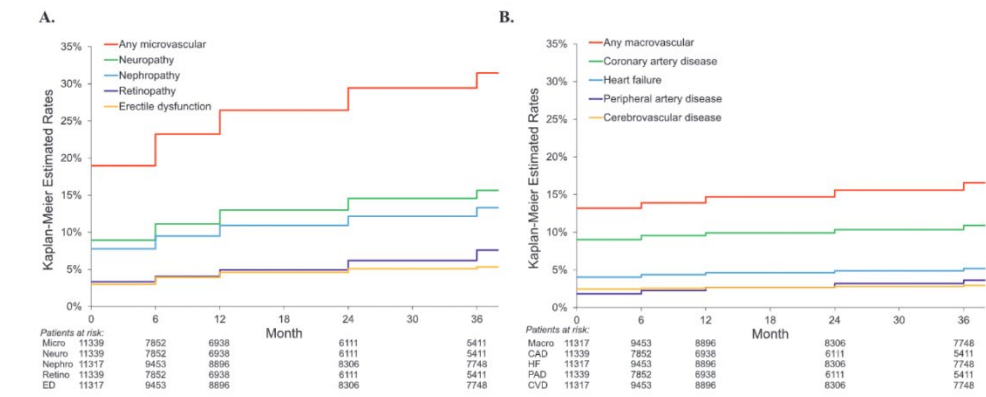
RW Major, MJ Davies, W Crasto, LJ Gray, DR Webb & K Khunti

Journal of Human Hypertension 29, 185-189 (2015) | Download Citation

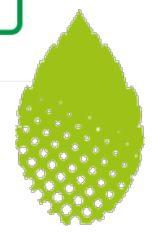
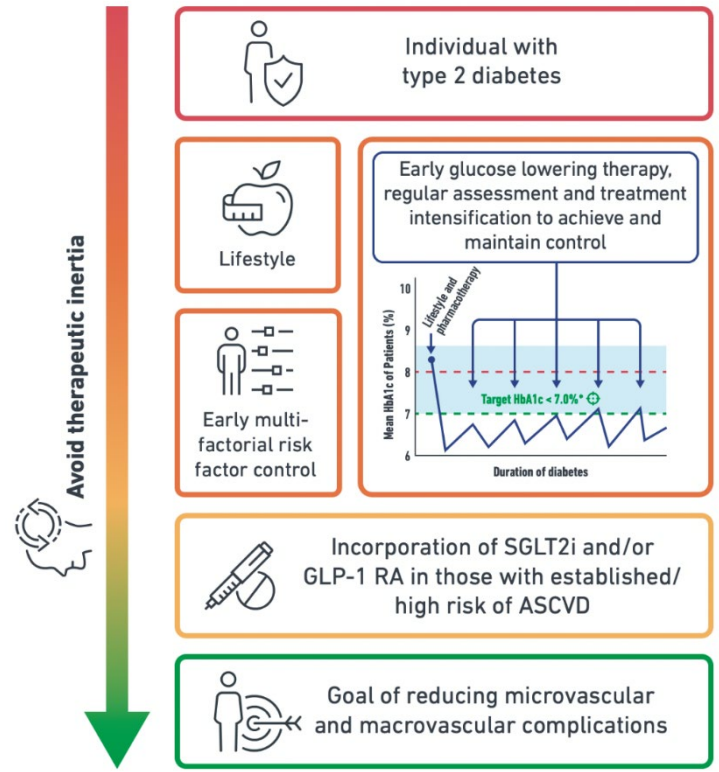
Abstract

Data suggest increased rates of chronic kidney disease (CKD) in those with undiagnosed hypertension (HTN). Our study aimed to determine the prevalence of CKD in undiagnosed hypertension in a previously unreported subgroup of individuals of South Asian ethnicity. We analysed data from subjects in the ADDITION-Leicester study, a UK based multiethnic, community diabetes screening study. Standard definitions included: HTN—mean recorded BP of $\geq 140/90$ mm Hg, CKD stage 3 and above—estimated glomerular filtration rate (eGFR) < 60 ml min⁻¹ per 1.73 m² and microalbuminuria as albumin creatinine ratio ≥ 3 mg mmol⁻¹.

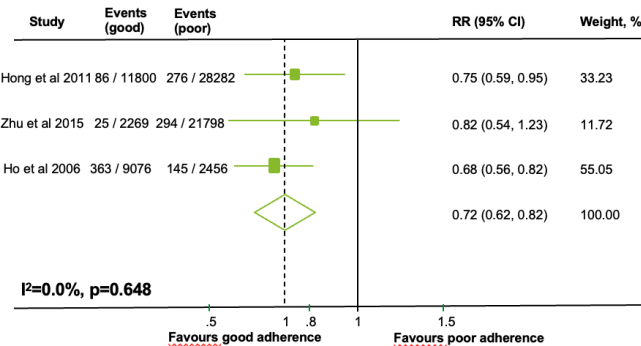
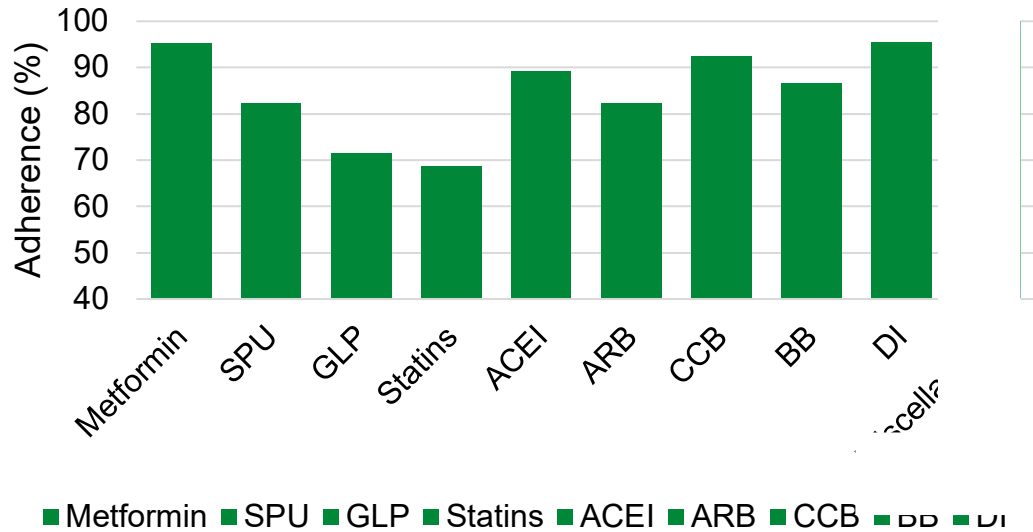
Logistic regression was performed with age, gender and body mass index (kg m⁻²) as co-variables. 6082 individuals (52.5% female, mean age, 57.2 years; White European, 77.8% and South Asian, 22.0%), 31.1% had undiagnosed HTN. Overall, individuals with undiagnosed HTN compared with normotensives had an odds ratio for microalbuminuria of 2.24 (95% confidence interval (CI): 1.72-2.94). For South Asians, the odds ratio was 3.81 (95% CI: 2.24-6.47) for microalbuminuria with a trend towards an eGFR < 60 ml min⁻¹ per 1.73 m². Future studies should consider intensified screening for HTN to refine the population suitable for CKD screening, particularly in the South Asian ethnic group.



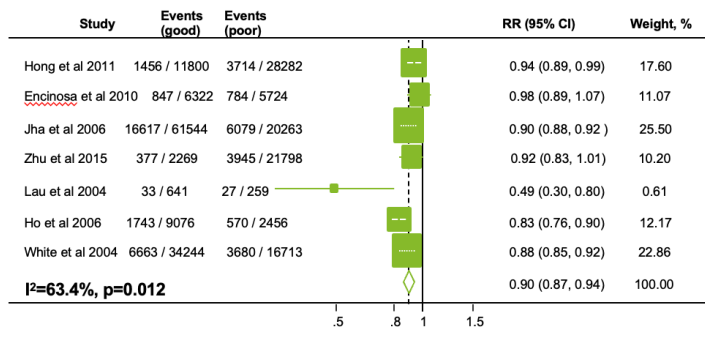
Kaplan-Meier estimates of microvascular (A) and macrovascular (B) complications over 3 years of follow-up



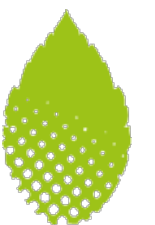
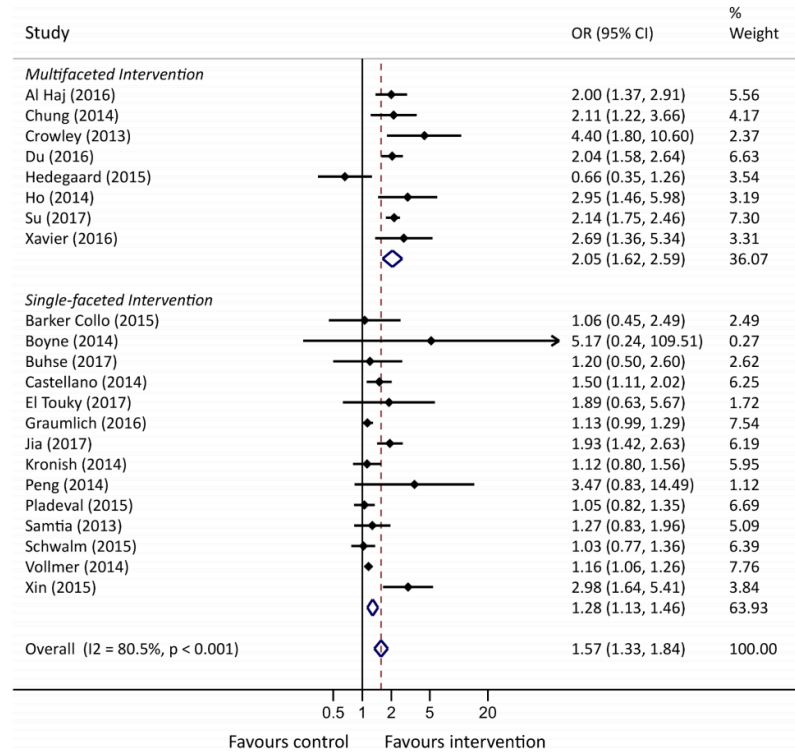
Adherence: Objective measures, impact on outcomes & interventions to improve adherence



Hospitalisation 0.72 (95% CI 0.62–0.82)



All-cause mortality 0.90 (95% CI 0.87–0.94)



Obesity Research: Ethnic BMI-WC cut-points, Young T2DM & therapeutic programmes risk

PRIMARY CARE DIABETES 5 (2013) 55-57

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Brief report

Ethnic differences in body composition in adolescents

Margaret A. Stone*^a, Lisa Williams^a, Sudesna Chatterjee^b, Melanie J. Davies^c, Kamlesh Khunti^d

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PRIMARY CARE DIABETES 5 (2013) 74-79

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Primary Care Diabetes

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Original research

Characteristics, complications and management of a large multiethnic cohort of younger adults with type 2 diabetes

Katrin Benhalima^a*, Soon H. Song^b, Emma G. Wilmut^c, Kamlesh Khunti^d, Laura J. Gray^e, Ian Laurence^f, Melanie Davies^g

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PRIMARY CARE DIABETES 5 (2013) 50-54

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Primary Care Diabetes

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Original research

Type 2 diabetes in younger adults: Clinical characteristics, diabetes-related complications and management of risk factors

Katrin Benhalima^a*, Emma Wilmut^c, Kamlesh Khunti^d, Laura J. Gray^e, Ian Laurence^f, Melanie Davies^g

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ARTICLE INFO

Defining Obesity Cut-Off Points for Migrant South Asians

Laura J. Gray^a, Thomas Yates^b, Melanie J. Davies^c, Emer Brady^d, David R. Webb^e, Naved Sattar^f, Kamlesh Khunti^g*

^a Department of Health Sciences, University of Leicester, United Kingdom; ^b Department of Cardiovascular Sciences, University of Leicester, United Kingdom; ^c Department of Health Sciences, University of Leicester, United Kingdom; ^d Department of Health Sciences, University of Leicester, United Kingdom; ^e Department of Health Sciences, University of Leicester, United Kingdom; ^f Department of Health Sciences, University of Leicester, United Kingdom; ^g Department of Health Sciences, University of Leicester, United Kingdom

Abstract

Background: Body mass index (BMI) and waist circumference (WC) are used to define cardiovascular and type 2 diabetes risk. We aimed to derive appropriate BMI and WC obesity cut-off points in a migrant South Asian population.

Methods: Ethnic White Europeans and 1333 South Asian residents in the UK aged 40-75 years inclusive were screened for type 2 diabetes. Principal component analysis was used to derive a glycemic, lipid, and a blood pressure factor. Regression models for each factor, adjusted for age and stratified by sex, were used to identify BMI and WC cut-off points in South Asians that correspond to those defined for White Europeans.

Findings: For South Asian males, derived BMI obesity cut-off point equivalent to 30.0 kg/m² in White Europeans were 24.4 kg/m² (95% Confidence Interval (95% CI) 20.7 kg/m² to 28.1 kg/m²) for the glycemic factor, 26.0 kg/m² (95% CI 24.4 kg/m² to 27.2 kg/m²) for the lipid factor, and 28.4 kg/m² (95% CI 26.5 kg/m² to 30.3 kg/m²) for the blood pressure factor. For WC, derived cut-points for South Asian males equivalent to 102 cm in White Europeans were 88 cm (95% CI 82.3 cm to 93.7 cm) for the glycemic factor, 84.4 cm (95% CI 80.9 cm to 87.9 cm) for the lipid factor, and 92.3 cm (95% CI 87.3 cm to 97.3 cm) for the blood pressure factor. Lower obesity cut-off points were seen for females for both BMI and WC.

Conclusions: Substantially lower obesity cut-points are needed in South Asians to detect an equivalent level of glycemic and dyslipidemia as observed in White Europeans. South Asian ethnicity could be considered as a similar level of risk as obesity in White Europeans for the development of type 2 diabetes.

ARTICLE INFO

Body Mass Index and Waist Circumference Cut-Points in Multi-Ethnic Populations from the UK and India: The ADDITION-Leicester, Jaipur Heart Watch and New Delhi Cross-Sectional Studies

Danielle H. Bodinot^a, Laura J. Gray^b, Joseph Henson^c, David Webb^d, Arvind Gurni^e, Anoop Misra^f, Rajeev Gupta^g, Navil Vikram^h, Naved Sattarⁱ, Melanie J. Davies^j, Kamlesh Khunti^k*

^a University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^b University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^c University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^d University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^e University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^f University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^g University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^h University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ⁱ University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^j University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^k University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom

Abstract

Aims: To derive cut-points for body mass index (BMI) and waist circumference (WC) for minority ethnic groups that are risk equivalent based on endogenous glucose levels to cut-points for white Europeans (BMI 30 kg/m², WC men 102 cm, WC women 88 cm).

Materials and Methods: Cross-sectional data from participants aged 40-75 years: 4272 white and 1348 migrant South Asian participants from ADDITION-Leicester (UK) and 981 indigenous South Asians from Jaipur Heart Watch (New Delhi) studies (India). Cut-points were derived using fractional polynomial models with fasting and 2-hour glucose as outcomes, and ethnicity, ethnicity-by-measured BMI/WC, their interaction and age as covariates.

Results: Based on fasting glucose, obesity cut-points were 23.9 kg/m² (95% Confidence Interval 24.36 for migrant South Asian, and 18.4 kg/m² (16.20 for indigenous South Asian populations. For men, WC cut-points were 90 cm (85 for South Asian, and 87 cm (82.41 for indigenous South Asian populations. For women, WC cut-points were 77 cm (71.83 for migrant South Asian, and 54 cm (50.45 for indigenous South Asian populations. Cut-points based on 2-hour glucose were lower than this.

Conclusions: These findings strengthen evidence that health interventions are required at a lower BMI and WC for South Asian individuals. Based on our data and the existing literature, we suggest an obesity threshold of 25 kg/m² for South Asians, individually, and a very high WC threshold of 80 cm for South Asian men and 77 cm for South Asian women. Further work is required to determine whether lower cut-points are required for indigenous, than migrant, South Asians.

ARTICLE INFO

Original Article: Metabolism

Obesity and intermediate clinical outcomes in diabetes: evidence of a differential relationship across ethnic groups

C. Millett^a*, K. Khunti^a, J. Gray^b, S. Saxena^c, G. Netelov^d and A. Majeed^e

^a Westminster Primary Care Research Centre, Westminster FC 1 and Department of Primary Care Social Medicine, Imperial College, London, and ^b Department of Health Sciences, University of Leicester, Leicester, UK
^c Department of Health Sciences, University of Leicester, Leicester, UK
^d Department of Health Sciences, University of Leicester, Leicester, UK
^e Department of Health Sciences, University of Leicester, Leicester, UK

Abstract

Aims: To examine associations between obesity, ethnicity and intermediate clinical outcomes in diabetes.

Methods: Population-based, cross-sectional study using electronic primary care medical records of 7300 people with diabetes from White, Black and south Asian ethnic groups.

Results: The pattern of obesity defined different ethnic groups, with rates significantly higher in younger when compared to older Black females, 67% vs. 48%, $P < 0.002$, men, 73% vs. 20%, $P < 0.001$ and south Asian females, 47% vs. 27%, $P < 0.01$; men, 21% vs. 13%, $P < 0.03$ people. Those people with diabetes were significantly less likely to achieve an established target for blood pressure control (adjusted odds ratio 0.50, 95% confidence interval 0.42, 0.59). Differences in mean systolic blood pressure in obese and normal weight persons were significant in the White group but not in the Black groups or south Asian groups (6.9 mmHg, 1.9 mmHg and 2.7 mmHg, respectively). Differences in mean diastolic blood pressure between obese and normal weight persons were 4.8 mmHg, 1.6 mmHg and 1.8 mmHg in the White, Black and south Asian groups. Mean HbA_{1c} and achievement of an established treatment target did not differ significantly with obesity in any ethnic group.

Conclusions: Obesity is more prevalent among younger people than older people with diabetes in ethnic minority groups. The relationship between obesity and blood pressure control in diabetes differs markedly across ethnic groups. Major efforts must be implemented, especially in young people, to reduce levels of obesity in diabetes and improve long-term outcomes.

ARTICLE INFO

Introduction

Obesity is a key risk factor for many chronic diseases, the most prevalent of which are type 2 diabetes and cardiovascular disease (CVD), collectively called cardiovascular disease (1). It is also used to identify high risk groups. Body mass index (BMI), calculated as weight (kg) divided by height squared (m²), is the most common method of assessing adiposity in usual health care practice. Based on epidemiological evidence investigating associations with mortality and morbidity, BMI cut-points of 25 kg/m² and 30 kg/m² are conventionally used to identify overweight and obesity respectively (2). While the use of BMI to identify high risk groups is well established, using these BMI cut-off points originates from White populations, given the increasing evidence that levels of risk associated with the classification of overweight and obesity vary across racial groups (3). In 2004, an expert consultation by the World Health Organization (WHO) recommended revised BMI cut-points for the classification of overweight (25 kg/m²) and obesity (30 kg/m²) in Asian populations (4). However, further evidence suggests that these revised categorizations may still under

represent the risk of cardiovascular disease to people originating from India, Pakistan and Bangladesh (5-7). A recent consensus statement advised that BMI cut-off points for overweight and obesity should be lowered to 23 kg/m² and 27 kg/m² respectively for Indian Asians (8). This was reviewed by the South Asian Health Foundation (SAHF), that has major implications because lower categorizations increasingly advocate the use of obesity prevention and treatment as a method of reducing the risk of cardiovascular disease. There has therefore been a call for derivation of ethnicity-specific health care advice in minority populations (9,10).

Waist circumference (WC) is another clinically relevant and increasingly used method of assessing adiposity. Whereas BMI provides a measure of overall adiposity, WC provides a surrogate measure of abdominal adiposity, and is the best correlate to visceral fat mass. Higher levels of WC are strongly associated with risk factors for, and incidence of, cardiovascular disease and the relationship to water retention (in particular, diastolic blood pressure) is also stronger (11). However, further evidence suggests that these revised categorizations may still under

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Danielle H. Bodinot^a, Laura J. Gray^b, Joseph Henson^c, David Webb^d, Arvind Gurni^e, Anoop Misra^f, Rajeev Gupta^g, Navil Vikram^h, Naved Sattarⁱ, Melanie J. Davies^j, Kamlesh Khunti^k*

^a University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^b University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^c University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^d University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^e University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^f University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^g University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^h University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ⁱ University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^j University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^k University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom

Abstract

Aims: To derive cut-points for body mass index (BMI) and waist circumference (WC) for minority ethnic groups that are risk equivalent based on endogenous glucose levels to cut-points for white Europeans (BMI 30 kg/m², WC men 102 cm, WC women 88 cm).

Materials and Methods: Cross-sectional data from participants aged 40-75 years: 4272 white and 1348 migrant South Asian participants from ADDITION-Leicester (UK) and 981 indigenous South Asians from Jaipur Heart Watch (New Delhi) studies (India). Cut-points were derived using fractional polynomial models with fasting and 2-hour glucose as outcomes, and ethnicity, ethnicity-by-measured BMI/WC, their interaction and age as covariates.

Results: Based on fasting glucose, obesity cut-points were 23.9 kg/m² (95% Confidence Interval 24.36 for migrant South Asian, and 18.4 kg/m² (16.20 for indigenous South Asian populations. For men, WC cut-points were 90 cm (85 for South Asian, and 87 cm (82.41 for indigenous South Asian populations. For women, WC cut-points were 77 cm (71.83 for migrant South Asian, and 54 cm (50.45 for indigenous South Asian populations. Cut-points based on 2-hour glucose were lower than this.

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ARTICLE INFO

Original Article: Metabolism

Obesity and intermediate clinical outcomes in diabetes: evidence of a differential relationship across ethnic groups

C. Millett^a*, K. Khunti^a, J. Gray^b, S. Saxena^c, G. Netelov^d and A. Majeed^e

^a Westminster Primary Care Research Centre, Westminster FC 1 and Department of Primary Care Social Medicine, Imperial College, London, and ^b Department of Health Sciences, University of Leicester, Leicester, UK
^c Department of Health Sciences, University of Leicester, Leicester, UK
^d Department of Health Sciences, University of Leicester, Leicester, UK
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Abstract

Aims: To examine associations between obesity, ethnicity and intermediate clinical outcomes in diabetes.

Methods: Population-based, cross-sectional study using electronic primary care medical records of 7300 people with diabetes from White, Black and south Asian ethnic groups.

Results: The pattern of obesity defined different ethnic groups, with rates significantly higher in younger when compared to older Black females, 67% vs. 48%, $P < 0.002$, men, 73% vs. 20%, $P < 0.001$ and south Asian females, 47% vs. 27%, $P < 0.01$; men, 21% vs. 13%, $P < 0.03$ people. Those people with diabetes were significantly less likely to achieve an established target for blood pressure control (adjusted odds ratio 0.50, 95% confidence interval 0.42, 0.59). Differences in mean systolic blood pressure in obese and normal weight persons were significant in the White group but not in the Black groups or south Asian groups (6.9 mmHg, 1.9 mmHg and 2.7 mmHg, respectively). Differences in mean diastolic blood pressure between obese and normal weight persons were 4.8 mmHg, 1.6 mmHg and 1.8 mmHg in the White, Black and south Asian groups. Mean HbA_{1c} and achievement of an established treatment target did not differ significantly with obesity in any ethnic group.

Conclusions: Obesity is more prevalent among younger people than older people with diabetes in ethnic minority groups. The relationship between obesity and blood pressure control in diabetes differs markedly across ethnic groups. Major efforts must be implemented, especially in young people, to reduce levels of obesity in diabetes and improve long-term outcomes.

ARTICLE INFO

Introduction

Obesity is a key risk factor for many chronic diseases, the most prevalent of which are type 2 diabetes and cardiovascular disease (CVD), collectively called cardiovascular disease (1). It is also used to identify high risk groups. Body mass index (BMI), calculated as weight (kg) divided by height squared (m²), is the most common method of assessing adiposity in usual health care practice. Based on epidemiological evidence investigating associations with mortality and morbidity, BMI cut-points of 25 kg/m² and 30 kg/m² are conventionally used to identify overweight and obesity respectively (2). While the use of BMI to identify high risk groups is well established, using these BMI cut-off points originates from White populations, given the increasing evidence that levels of risk associated with the classification of overweight and obesity vary across racial groups (3). In 2004, an expert consultation by the World Health Organization (WHO) recommended revised BMI cut-points for the classification of overweight (25 kg/m²) and obesity (30 kg/m²) in Asian populations (4). However, further evidence suggests that these revised categorizations may still under

represent the risk of cardiovascular disease to people originating from India, Pakistan and Bangladesh (5-7). A recent consensus statement advised that BMI cut-off points for overweight and obesity should be lowered to 23 kg/m² and 27 kg/m² respectively for Indian Asians (8). This was reviewed by the South Asian Health Foundation (SAHF), that has major implications because lower categorizations increasingly advocate the use of obesity prevention and treatment as a method of reducing the risk of cardiovascular disease. There has therefore been a call for derivation of ethnicity-specific health care advice in minority populations (9,10).

Waist circumference (WC) is another clinically relevant and increasingly used method of assessing adiposity. Whereas BMI provides a measure of overall adiposity, WC provides a surrogate measure of abdominal adiposity, and is the best correlate to visceral fat mass. Higher levels of WC are strongly associated with risk factors for, and incidence of, cardiovascular disease and the relationship to water retention (in particular, diastolic blood pressure) is also stronger (11). However, further evidence suggests that these revised categorizations may still under

ARTICLE INFO

Body Mass Index and Waist Circumference Cut-Points in Multi-Ethnic Populations from the UK and India: The ADDITION-Leicester, Jaipur Heart Watch and New Delhi Cross-Sectional Studies

Danielle H. Bodinot^a, Laura J. Gray^b, Joseph Henson^c, David Webb^d, Arvind Gurni^e, Anoop Misra^f, Rajeev Gupta^g, Navil Vikram^h, Naved Sattarⁱ, Melanie J. Davies^j, Kamlesh Khunti^k*

^a University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^b University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^c University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^d University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^e University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^f University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^g University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^h University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ⁱ University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^j University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom; ^k University of Leicester, Diabetes Research Centre, Leicester, Leicestershire, United Kingdom

Abstract

Aims: To derive cut-points for body mass index (BMI) and waist circumference (WC) for minority ethnic groups that are risk equivalent based on endogenous glucose levels to cut-points for white Europeans (BMI 30 kg/m², WC men 102 cm, WC women 88 cm).

Materials and Methods: Cross-sectional data from participants aged 40-75 years: 4272 white and 1348 migrant South Asian participants from ADDITION-Leicester (UK) and 981 indigenous South Asians from Jaipur Heart Watch (New Delhi) studies (India). Cut-points were derived using fractional polynomial models with fasting and 2-hour glucose as outcomes, and ethnicity, ethnicity-by-measured BMI/WC, their interaction and age as covariates.

Results: Based on fasting glucose, obesity cut-points were 23.9 kg/m² (95% Confidence Interval 24.36 for migrant South Asian, and 18.4 kg/m² (16.20 for indigenous South Asian populations. For men, WC cut-points were 90 cm (85 for South Asian, and 87 cm (82.41 for indigenous South Asian populations. For women, WC cut-points were 77 cm (71.83 for migrant South Asian, and 54 cm (50.45 for indigenous South Asian populations. Cut-points based on 2-hour glucose were lower than this.

Conclusions: These findings strengthen evidence that health interventions are required at a lower BMI and WC for South Asian individuals. Based on our data and the existing literature, we suggest an obesity threshold of 25 kg/m² for South Asians, individually, and a very high WC threshold of 80 cm for South Asian men and 77 cm for South Asian women. Further work is required to determine whether lower cut-points are required for indigenous, than migrant, South Asians.

ARTICLE INFO

Original Article: Metabolism

Obesity and intermediate clinical outcomes in diabetes: evidence of a differential relationship across ethnic groups

C. Millett^a*, K. Khunti^a, J. Gray^b, S. Saxena^c, G. Netelov^d and A. Majeed^e

^a Westminster Primary Care Research Centre, Westminster FC 1 and Department of Primary Care Social Medicine, Imperial College, London, and ^b Department of Health Sciences, University of Leicester, Leicester, UK
^c Department of Health Sciences, University of Leicester, Leicester, UK
^d Department of Health Sciences, University of Leicester, Leicester, UK
^e Department of Health Sciences, University of Leicester, Leicester, UK

Abstract

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Chronic kidney disease

WILEY

ORIGINAL ARTICLE

Significant reduction in chronic kidney disease progression with sodium-glucose cotransporter-2 inhibitors compared to dipeptidyl peptidase-4 inhibitors in adults with type 2 diabetes in a UK clinical setting: An observational outcomes study based on international guidelines for kidney disease

Iskandar Idris MD¹ | Ruiqi Zhang PhD^{2,3} | Jil B. Mamza PhD³ | Mike Ford BSc³ | Tamsin Morris BSc³ | Amitava Banerjee MD^{4,5} | Kamlesh Khunti MD⁶



Research Paper

Outcome trends in people with heart failure, type 2 diabetes mellitus and chronic kidney disease in the UK over twenty years

Claire A Lawson^{a,b,1}, Samuel Seidu^{a,1,*}, Francesco Zaccardi^a, Gerry McCann^{b,c}, Umesh T Kadam^{a,d}, Melanie J Davies^a, Carolyn SP Lam^e, Hiddo L. Heerspink^{f,g}, Kamlesh Khunti^a

^a Diabetes Research Centre, University of Leicester, Leicester, United Kingdom

^b Department of Cardiovascular Sciences, University of Leicester, Leicester, United Kingdom

^c National Institute for Health Research Biomedical Research Centre, Glenfield Hospital, Leicester, United Kingdom

^d Department of Health Sciences, University of Leicester, Leicester, United Kingdom

^e National Heart Centre Singapore, Duke-NUS, Singapore, University Medical Centre Groningen, the Netherlands

^f The George Institute for Global Health, Sydney, Australia

^g University of New South Wales, Sydney, Australia

BMJ
open
accessible medical research

Feasibility of a structured group education session to improve self-management of blood pressure in people with chronic kidney disease: an open randomised pilot trial

Jo Byrne,¹ Kamlesh Khunti,² Margaret Stone,² Azhar Farooqi,³ Sue Carr¹

Prevalence and progression of chronic kidney disease among patients with type 2 diabetes: Insights from the DISCOVER study

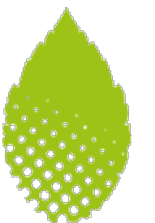
Kamlesh Khunti MD¹ | Bernard Charbonnel MD² | Hungta Chen PhD³ | David Z. Cherney MD⁴ | Andrew Cooper PhD⁵ | Peter Fenici MD⁵ | Marilia B. Gomes MD⁶ | Niklas Hammar PhD^{7,8} | Hiddo J. L. Heerspink PhD⁹ | Linong Ji MD¹⁰ | Jesús Medina PhD¹¹ | Antonio Nicolucci MD¹² | Larisa Ramirez MD¹³ | Wolfgang Rathmann MD¹⁴ | Marina V. Shestakova MD¹⁵ | Ichihiro Shimomura MD¹⁶ | Fengming Tang MS¹⁷ | Hirotaka Watada MD¹⁸ | Mikhail Kosiborod MD^{17,19,20} | on behalf of the DISCOVER Investigators

Association of anthropometric obesity measures with chronic kidney disease risk in a non-diabetic patient population

James O. Burton¹, Laura J. Gray², David R. Webb³, Melanie J. Davies³, Kamlesh Khunti², Justin Crasto³, Sue J. Carr¹ and Nigel J. Brunskill¹

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Mental health and chronic diseases



Association of Cardiometabolic Multimorbidity and Depression With Cardiovascular Events in Early-Onset Adult Type 2 Diabetes: A Multiethnic Study in the U.S.

Diabetes Care 2021;44:231–239 | <https://doi.org/10.2337/dc20-2045>

RESEARCH ARTICLE

The association between depressive symptoms and insulin resistance, inflammation and adiposity in men and women

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John Epoh Dibato,¹ Olga Montvida,¹ Francesco Zaccardi,² Jack Alistair Sargeant,^{2,3} Melanie J. Davies,^{2,3} Kamlesh Khunti,^{2,3} and Sanjoy K. Paul¹



Impact of Depression and Anxiety on Change to Physical Activity Following a Pragmatic Diabetes Prevention Program Within Primary Care: Pooled Analysis From Two Randomized Controlled Trials

Diabetes Care 2019;42:1847–1853 | <https://doi.org/10.2337/dc19-0400>

Thomas Yates,^{1,2} Laura J. Gray,³ Joseph Henson,^{1,2} Charlotte L. Edvardson,^{1,2} Kamlesh Khunti,^{1,4} and Melanie J.

DIABETES RESEARCH AND CLINICAL PRACTICE I56 (2019) I07816



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Comorbid depression and risk of cardiac events and cardiac mortality in people with diabetes: A systematic review and meta-analysis

A. Farooqi^{a,*}, K. Khunti^{b,c,1}, S. Abner^c, C. Gillies^{b,c}, R. Morriss^d, S. Seidu^{b,c,1}

^aBirmingham City University, Faculty of Business, Law and Social Sciences, Birmingham B4 7BD, UK

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Diabetes Care Volume 42, October 2019

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PLOS ONE

The Prevalence of Depression in White-European and South-Asian People with Impaired Glucose Regulation and Screen-Detected Type 2 Diabetes Mellitus

Navneet Aujla¹, Keith R. Abrams¹, Melanie J. Davies¹, Nick Taub², Timothy C. Skinner², Kamlesh Khunti¹
¹Department of Health Sciences, University of Leicester, Leicester, United Kingdom, ²Department of Cardiovascular Sciences, University of Leicester, Leicester, United Kingdom, ³Combined Universities Centre for Rural Health, Queensland, Australia

DIABETES

Original Article: Epidemiology

The prevalence of depressive symptoms in a white European and South Asian population with impaired glucose regulation and screen-detected Type 2 diabetes mellitus: a comparison of two screening tools

Research: Educational and Psychological Aspects

Association of depression and anxiety with clinical, sociodemographic, lifestyle and environmental factors in South Asian and white European individuals at high risk of diabetes

Prevalence of diagnosed depression in South Asian and white European people with type 1 and type 2 diabetes mellitus in a UK secondary care population

S. Ali,¹ M. J. Davies,² N. A. Taub,³ M. A. Stone,³ K. Khunti²

ABSTRACT

Aim: To examine the prevalence and correlates of diagnosed depression among South Asians and white Europeans with type 1 and type 2 diabetes mellitus, attending a specialist diabetes clinic in the UK.
Study design and methods: A cross-sectional study was conducted using the hospital clinic's computerised database. Medical and demographic data were extracted for 6230 people with diabetes attending the clinic between 2003 and 2005. Multiple logistic regression was used to model ethnic differences in the probability of diagnosed depression after controlling for demographic and diabetes related factors. Analyses were conducted separately for type 1 and type 2 diabetes.
Results: The unadjusted prevalence of depression in people with type 1 and type 2 diabetes was 8.0% and 9.3%, respectively. Risk factors for depression in type 1 diabetes included female gender, diabetes related complications, and comorbidities. In people with type 2 diabetes the risk factors for depression included younger age, diabetes related complications, comorbidities, insulin use and deprivation. In addition, white Europeans were significantly more likely to be diagnosed with depression compared to South Asians (odds ratio [OR] 1.58, 95% confidence interval [CI] 1.21 to 2.08; p<0.001). Further interaction analyses revealed no evidence that the association between ethnicity and depression differed according to any of the other factors examined in this study.
Conclusions: The findings add to the limited body of knowledge regarding ethnic differences in depression and diabetes. Among those with type 2 diabetes, white Europeans had nearly 60% higher adjusted odds of

comorbidity in recent years," the literature has so far failed to examine the association in migrant South Asian populations (people of Indian, Pakistani, Bangladeshi or Sri Lankan descent). A steady increase in the incidence of T1DM diabetes has been observed UK South Asian children, with the rising rate also demonstrated to be higher in comparison to other ethnic groups.² Epidemiological studies conducted in various parts of the world have also observed a dramatic increase in the prevalence of T2DM in South Asians, with reports of up to a fourfold increased risk in comparison to white Europeans.³ Furthermore, poor glycaemic control, microalbuminuria, retinopathy and cardiovascular disease mortality have been shown to be higher in this group compared to white Europeans.⁴ The present study aims to address this gap in the literature by examining the prevalence and ethnic differences in the risk of diagnosed depression between South Asian and white European people with T1DM and T2DM. In addition we aim to determine whether the factors associated with depression vary between these two ethnic groups.

DATA SOURCE AND METHODS

A cross-sectional study was conducted using the computerised database (clinical workstation) at a hospital diabetes and endocrinology clinic based in Leicestershire, UK. Leicestershire has one of the largest diabetes services in the UK, with a population of approximately 1 million, of whom 56 600 are registered as having diabetes. The proportion of

Research: Under-representation populations & research priorities for research

DIABETES Medicine

DOI: 10.1111/1365-2330

Short Report: Epidemiology

Representation of people of South Asian origin in cardiovascular outcome trials of glucose-lowering therapies in Type 2 diabetes

K. Khunti¹, S. Bellary², M. A. Karamat³, K. Patel³, V. Patel⁴, A. Jones⁵, J. Gray⁵, P. Shepherd⁵ and W. Hanif⁶ on behalf of the South Asian Health Foundation

¹Leicester Diabetes Centre, University of Leicester, Leicester; ²Aston Research Centre for Healthy Ageing, Aston University; ³Heart of England NHS Foundation Trust, Birmingham; ⁴Warwick Medical School, University of Warwick, Coventry; ⁵S Communications Group, London and ⁶University Hospital Birmingham, Birmingham, UK

Accepted 25 February 2016

Abstract

Aims Our aim was to investigate the proportional representation of people of South Asian origin in cardiovascular outcome trials of glucose-lowering drugs or strategies in Type 2 diabetes, noting that these are among the most significant pieces of evidence used to formulate the guidelines on which clinical practice is largely based.

Methods We searched for cardiovascular outcome trials in Type 2 diabetes published before January 2015, and extracted data on the ethnicity of participants. These were compared against expected values for proportional representation of South Asian individuals, based on population data from the USA, from the UK, and globally.

Results Twelve studies met our inclusion criteria and, of these, eight presented a sufficiently detailed breakdown of participant ethnicity to permit numerical analysis. In general, people of South Asian origin were found to be under-represented in trials compared with UK and global expectations and over-represented compared with US expectations. Among the eight trials for which South Asian representation could be reliably estimated, seven under-represented this group relative to the 11.2% of the UK diabetes population estimated to be South Asian, with the representation in these trials ranging from 0.0% to 10.0%.

Conclusions Clinicians should exercise caution when generalizing the results of trials to their own practice, with regard to the ethnicity of individuals. Efforts should be made to improve reporting of ethnicity and improve diversity in trial recruitment, although we acknowledge that there are challenges that must be overcome to make this a reality.

Diabet. Med. 34, 64–68 (2017)

Introduction

People of South Asian origin are an important target for the prevention and treatment of diabetes. In the UK, for instance, Type 2 diabetes is about two times more prevalent in this group than in white European people [1]. Furthermore, in the USA, ~17.4% of people of South Asian origin have diabetes [2]. The risks of diabetic retinopathy and end-stage renal disease are known to be higher in South Asian people than in the white European population, and individuals of South Asian origin are also known to have a higher mortality rate from coronary heart disease and stroke [1].

There is also some evidence suggesting that there are ethnic differences in response to diabetes therapies. For instance,

glucagon-like peptide-1 receptor agonists have been found to lower HbA_{1c} levels to a greater extent in Asian-dominant studies than in non-Asian-dominant studies, perhaps reflecting a different pathophysiology of Type 2 diabetes in different ethnic groups [3].

As in other conditions, clinical practice in Type 2 diabetes is influenced heavily by various guidelines; these, in turn, are informed by clinical trials, with much weight being placed on cardiovascular outcome trials. The applicability of the results from trials to clinical practice is dependent on the representativeness of study participants' demographic characteristics. Studies in both acute and chronic conditions, however, have suggested that non-white ethnic groups are often under-represented in clinical trials [4–7]. Here, we report on the proportion of participants of South Asian origin recruited to cardiovascular outcome trials of glucose lowering in Type 2

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64 © 2016 Diabetes UK

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Under-representation of minority ethnic groups in cardiovascular research: a semi-structured interview study

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³Correspondence to: Paramjit S Gill, General Practitioner and Reader in Primary Care Research, Primary Care Clinical Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK; E-mail: p.s.gill@bham.ac.uk
Received 4 April 2012; Revised 6 August 2012; Accepted 8 August 2012.

Background. Minority ethnic groups are often excluded from research, and the reasons for this are complex.

Objective. This study aimed to explore why minority ethnic groups do not participate in research, and how their participation can be increased.

Methods. Ninety-one interviews were undertaken with people who either had ($n = 48$) or had not ($n = 43$) responded to the invitation to take part in a community heart failure screening study. These were split across four ethnic groups (African Caribbean, Bangladeshi, Indian and Pakistani) and between men and women. Participants were interviewed once, face-to-face, either in English or with an interpreter if they wished. Interview transcripts were analysed thematically.

Results. The main reason for participating in the screening study was for a health/heart check. Many participants either had not understood that it was research or had not known what this meant. Most people who did not participate had not remembered receiving the invitation or had been unavailable at the time. Few participants, including those who had and those who had not participated in the screening study, had any understanding of the objectives and nature of research. Once this had been briefly explained to them, many described altruistic reasons for why they would participate in research in the future.

Conclusions. We have shown that South Asians and Black African-Caribbean communities are willing to take part in research as long as they are approached directly and the reasons for the research and potential benefits are explained clearly to them.

Keywords. Ethnic, generalizability, recruitment, research, under-representation.

Introduction

Cardiovascular disease remains the leading cause of global morbidity and mortality.¹ The burden of cardiovascular disease falls disproportionately on Black and Minority Ethnic groups (BMEGs) and those from lower socioeconomic groups at a younger age.^{2–4}

The aim of health research is to determine the best strategies for preventing and treating disease and to inform health policy. To ensure health policies serve a diverse population, it is important that all ethnic groups participate in health research. This ensures the generalizability of research results.^{5–12} However, to date few UK studies feature BMEGs in research.^{13–16} This qualitative study explored why minority ethnic groups do not participate in cardiovascular research and how their participation can be increased.

Methods

Recruitment

Participants were recruited from our large community-based study (E-ECHOES: ethnic-echo cardiographic heart of England screening study) of screening for heart failure in South Asians and Black African-Caribbean communities.^{17,18} For this we recruited 5406 participants for screening, and from the responders and non-responders who had given permission to be approached for further studies, potential participants for the current study were purposively selected to meet demographic criteria (ethnic group and sex) and to include those who had and had not taken part in the E-ECHOES study. Responders and non-responders had given permission to be approached for further studies. To allow inclusion of the range of divergent views, a minimum of 80 participants were included, so that

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South Asian Health Foundation

Diabetes UK

Diabetes UK and South Asian Health Foundation recommendations on diabetes research priorities for British South Asians

Kamlesh Khunti, Sudhesh Kumar and Jo Brodie



Guideline Memberships

Member, National Guideline Panel of Psychological Therapies for General Practice

1998 Member, RCGP/BDA National Guidelines for Type 2 Diabetes

2000 Member, National Service Framework for Diabetes

2010 Member, IDF Risk Score Steering Group

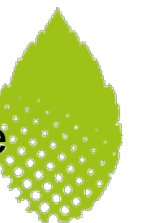
2012 Member, NICE, Assessing BMI and waist circumference thresholds among adults from black, Asian and other minority ethnic groups in the UK

2019 Co-Chair American Diabetes Association Therapeutic Inertia Summit

2019 Member, European Cardiology Guidelines

2019 Factors influencing safe glucose-lowering in older adults with type 2 diabetes: A Person-centred Approach To Individualised (PROACTIVE) Glycemic Goals for older people: A position statement of Primary Care Diabetes Europe

2020 Primary Care Diabetes Consensus Statement for management of hyperglycaemia in people with Type 2 Diabetes



Risk identification and interventions to prevent T2DM in adults at high risk: summary of NICE guidance



Diabetes Management in Chronic Kidney Disease: A Consensus Report by the American Diabetes Association (ADA) and Kidney Disease: Improving Global Outcomes (KDIGO)

<https://doi.org/10.2337/dci22-0027>

Ian H. de Boer,¹ Kamlesh Khunti,² Tami Sadusky,³ Katherine R. Tuttle,⁴ Joshua J. Neumiller,⁵ Connie M. Rhee,⁶ Sylvia E. Rosas,⁷ Peter Rossing,^{8,9} and George Bakris¹⁰

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²Diabetes Research Centre, University of Leicester, Leicester, U.K.
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⁸Steno Diabetes Center Copenhagen, Copenhagen, Denmark
⁹University of Copenhagen, Copenhagen, Denmark
¹⁰University of Chicago Medicine, Chicago, IL
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People with diabetes and chronic kidney disease (CKD) are at high risk for kidney failure, atherosclerotic cardiovascular disease, heart failure, and premature mortality. Recent clinical trials support new approaches to treat diabetes and CKD.



KDIGO 2020 CLINICAL PRACTICE GUIDELINE FOR DIABETES MANAGEMENT IN CHRONIC KIDNEY DISEASE

Diabetes Care Volume 40, January 2017

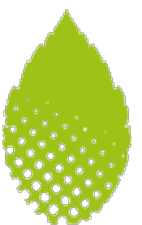
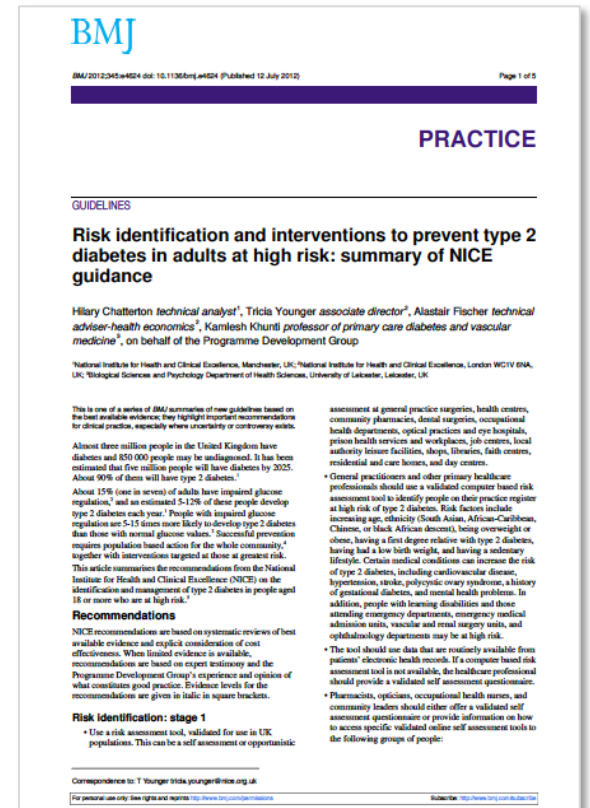
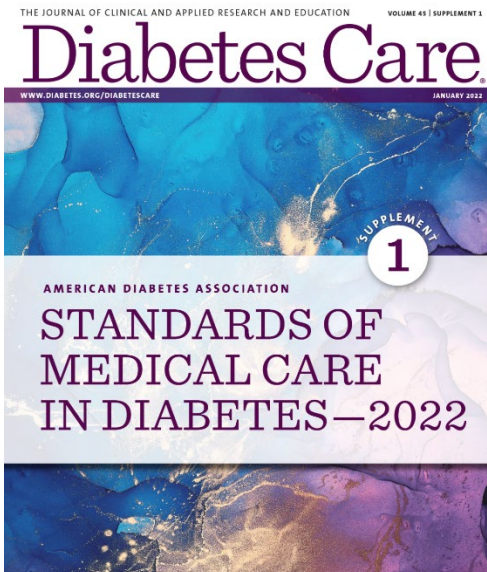
155



International Hypoglycaemia Study Group*

Glucose Concentrations of Less Than 3.0 mmol/L (54 mg/dL) Should Be Reported in Clinical Trials: A Joint Position Statement of the American Diabetes Association and the European Association for the Study of Diabetes

Diabetes Care 2017;40:155–157 | DOI: 10.2337/dc16-2215



**Experimental
Medicine**

Collaboration
with other BRUs



NIHR Leicester-
Loughborough
Lifestyle, Diet
and Physical
Activity BRU



Collaboration
with other BRUs



**Clinical
Trials**



Programme Grants



**Applied
Research**



Project Portfolio



Ongoing
Study



**Implementation
into Routine
Clinical Practice**



Modules
Implemented

Newly Diagnosed
and Foundation

**Walking Away
from Diabetes**

a Safer
Ramadan

BME Newly Diagnosed
and Foundation
South Asian

- Early detection using Risk Scores
- Misclassification of diabetes

Infrastructure &
Professional
Development



Leicester
Diabetes
Centre

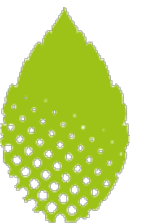


Leicester Centre For
Ethnic Health Research



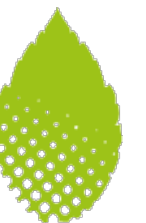
University of
Leicester
Diabetes Masters

BMJ Learning
Diabetes Diploma



Summary

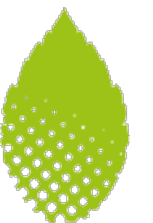
- Research & clinical practice are a journey and part of life with their ups and downs
- Don't expect anything from anyone
- Collaborations are important: Surround yourself with good people/mentors
- Contributions will have small incremental benefits
- Value what you have and what you learn & use it
- Remember your roots
- Stay humble, respect your team, share your success
- Always remember those who have helped you along the way
- Support next generation of researchers & clinicians
- **Have fun and enjoy the journey!**



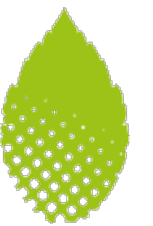
Diabetes and CVD in South Asians



“If the epidemic of CHD in south Asians is a disease of migration and has occurred within a generation, there is no reason why it should not be reversible on a similar time-scale”



Thank you





NIHR National Institute for Health Research

National Patient Recruitment Centre

← BROADLEAF AIR →

Leicester Changing Diabetes

Join Leicester... the gl... fight again... in dia... A cityw... h to...



KEEP YOUR DISTANCE

STOP!

Thank you!

Senior Team at the Leicester Diabetes Centre



**Sally
Schreder**



Sam Seidu



Tim Skelton



Janet Jarvis



**Pratik
Choudhary**



Tom Yates



**Claire
Lawson**



**Carol
Ackroyd**



**Donna
Richardson**



**Laura
Willcocks**



**Bernie
Stribling**



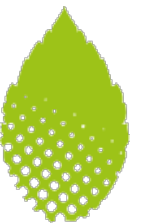
Clare Gillies



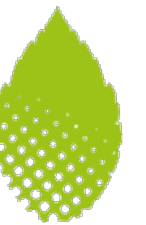
**Francesco
Zaccardi**



Mike Bonar



Thank you to my many partners



Thank you!

University of Leicester

Laura Gray
Richard Baker
Andy Wilson
Nilesh Samani
Azhar Farooqi

Imperial College London

Azeem Majeed
Chris Millett
Mariam Malochia
Shivani Misra
Jonathan Valabhji
Ed Gregg

Surrey University

Simon DeLusignan

University of Glasgow

Naveed Sattar

University of Warwick

Sudesh Kumar

University of Birmingham

Tony Barnett
Kiran Patel
Wasim Hanif
Jonathan Valabhji

Salford Royal Foundation

Bob Young

Unilever

Duncan Talbot
Joanne Dick
Jonathan Powell

University of Newcastle

Nigel Unwin
Mike Trenall

Peninsula Medical School

Andrew Hattersley
Colin Greaves
Phil Evans

University of Sheffield

Mike Gillett
Alan Brennan
Simon Heller

University of Cambridge

Nita Forouhi
Nick Wareham
Simon Griffin

Italy

Stefano Delprato

Belgium

Chantal Mathieu

Unites States

Vanita Aroda
John Buse
Mikhail Kosiborod
Silvio Inzucchi

Australia

Timothy Skinner
Sanjoy Paul
James Dunbar
Prasuna Reddy
Anushka Patel
Stuart Diddle

The Netherlands

Guy Rutten

Denmark

Knut Borch-Johnsen
Torstun Lauritzen
Anelli Sandbæk

India

Ranjan Yajnik
Anoop Misra
Nikhil Tandon
Shashnk Joshi
Mohan
Prabhakar

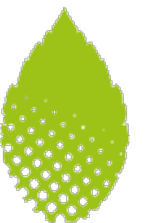
Finland

Jaakko Tuomilehto

Spain

Xavier Cos
Didac Mauricio

PCDS



Thank you to the new collaborators for the pandemic related work!

University of Portsmouth

Partha Kar

NHS England

Jonathan Valabhji

Imperial College

Shivani Misra

London School of Hygiene and Topical Medicine

Rohini Mathur

University College London

Amitava Banerjee

Harpreet Sood

Office of National Statistics

Vahe Nafilyan

Daniel Ayoubkhani

Karen Tingay

University of Leicester

Manish Pareek

Gerry McCann

Chris Brightling

Royal Free London

Sarah Ali

University of Edinburgh

Aziz Sheikh

Royal Free London

Sarah Ali

University of Oxford

Julia Hippisley-Cox

Nazrul Islam

Ben Goldacre

HDRUK

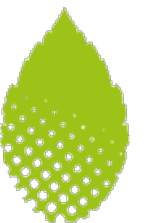
Cathie Sudlow

University of Bristol

Jonathan Sterne

University of Liverpool

Calum Semple

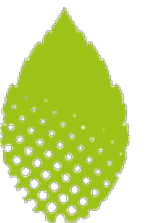


A massive thank you to my PhD students

1. David Webb
2. Saima Ali
3. Sudesna Chatterjee
4. Jenny Tringham
5. Winston Crasto
6. Tom Yates
7. Raj Mehta
8. Emer Brady
9. Maria-Anna Thomasouli
10. Claire Gilles
11. Emma Wilmott
12. Hamid Mani
13. Samiul Mostafa
14. Nitin Gholap
15. Nicola Perrin
16. Chloe Redshaw
17. Jo Mason
18. Charlotte Jellyman
19. Michelle Hadjiconstantinou
20. Alison Dunkley

21. Patrice Carter
22. Andy Willis
23. Kate Lager
24. Milena Castro
25. Bala Srinivasan
26. Shaun Barber
27. Gigo Thomas
28. Joe Henson
29. Sam Seidu
30. Matthew McCarthy
31. Kishan Bakrania
32. Zin Zin Htike
33. Thomas Chalk
34. Dan Lane
35. Elpida Vounzoulaki
36. Cameron Razieh
37. Humaira Hussein
38. Yogini Chudasama
39. Usman Muhammad
40. Francesco Zaccardi

41. Hanad Osman
42. Priscilla Katapa
43. Daniel Ayoubkhani
44. Sian Jenkins
45. Elizabeth Hickman
46. Ellen Hopwood
47. Ashkon Ardavani
48. Liam Neal
49. Meri Everett
50. Shukrat Olatunji
51. Mohammad Ali
52. Zara Kayani

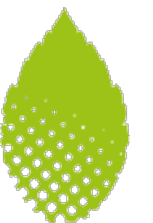


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Research Funding



BMJ Learning
Diabetes Diploma

NIHR | Applied Research Collaboration
East Midlands

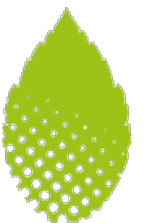


NIHR | Clinical Research Network
East Midlands

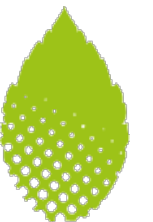
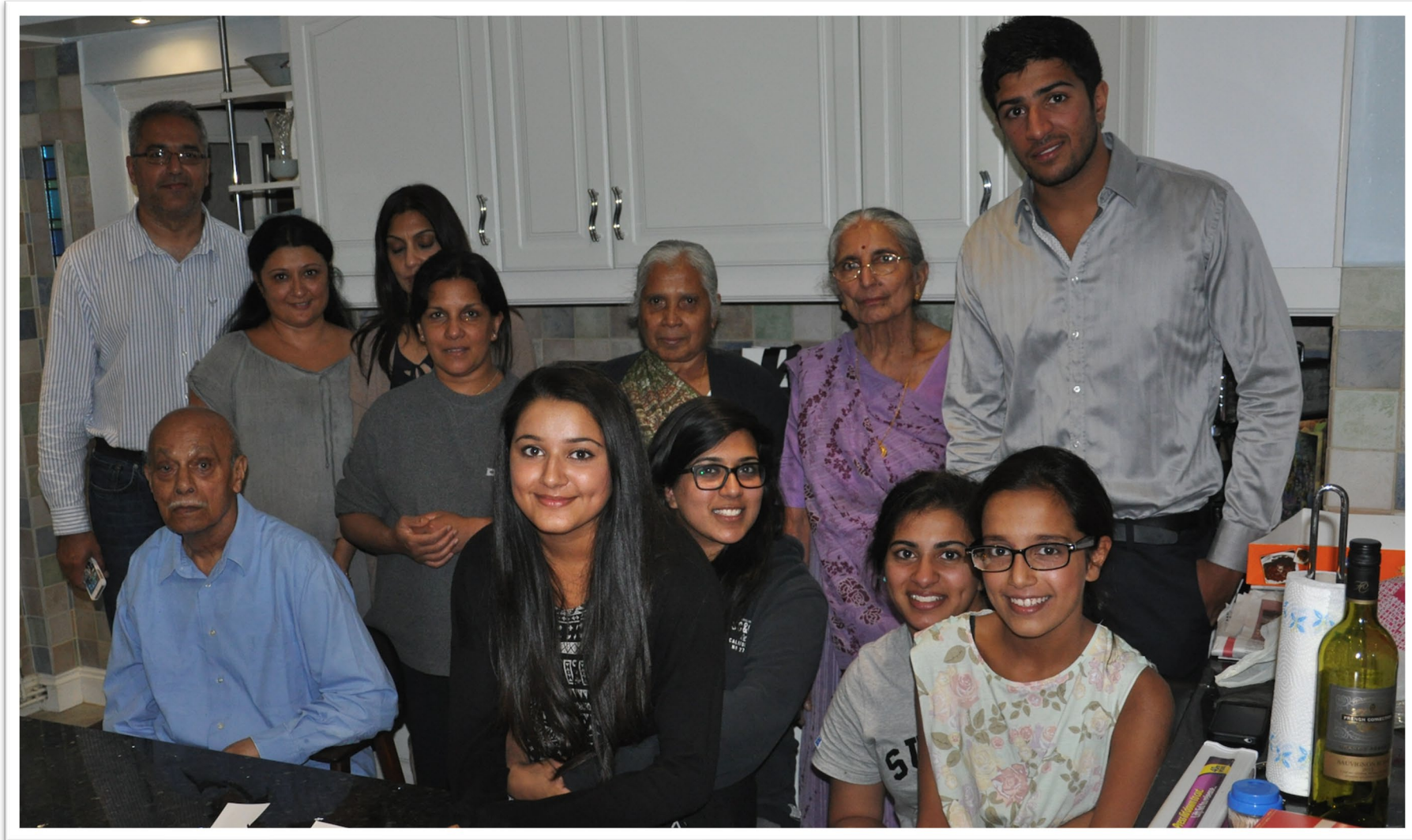
DIABETES UK
CARE. CONNECT. CAMPAIGN.



NIHR | Leicester Biomedical
Research Centre

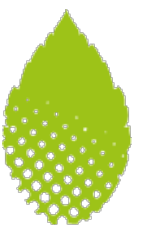
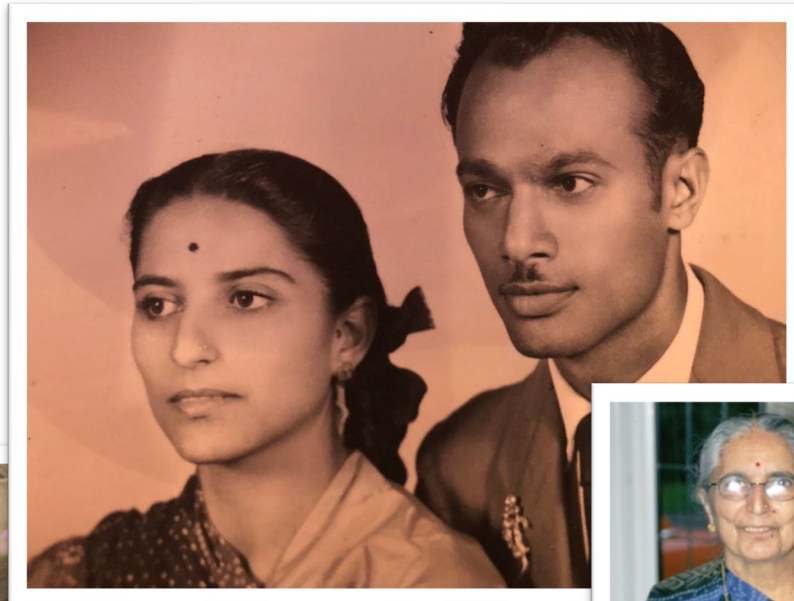
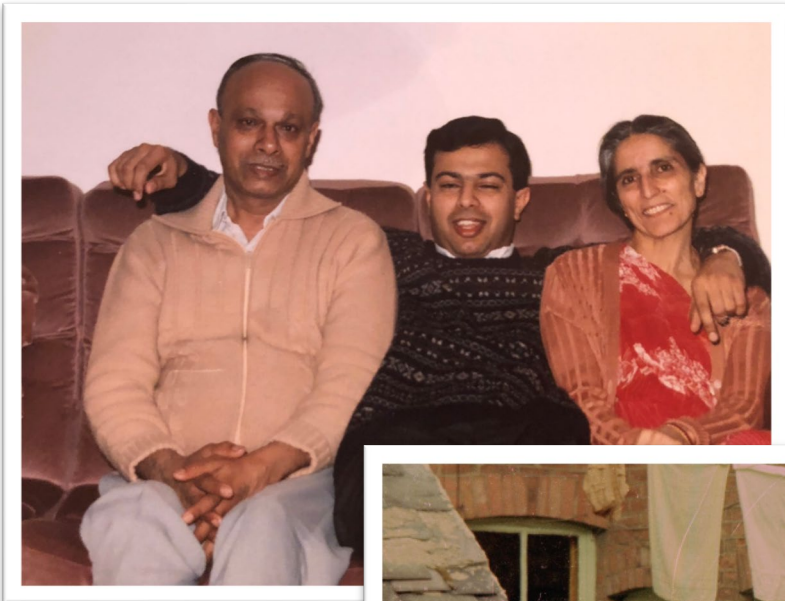


Saturday Munch Bunch for keeping me going



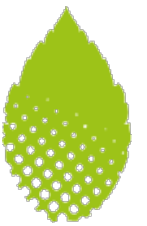
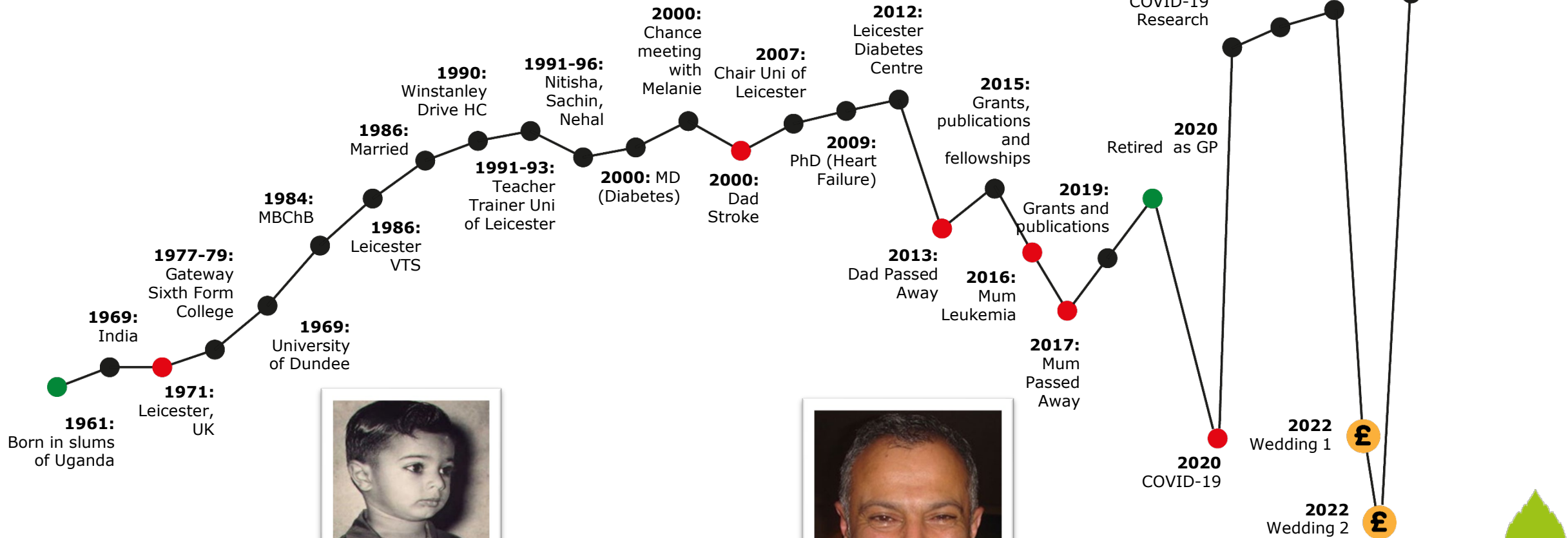


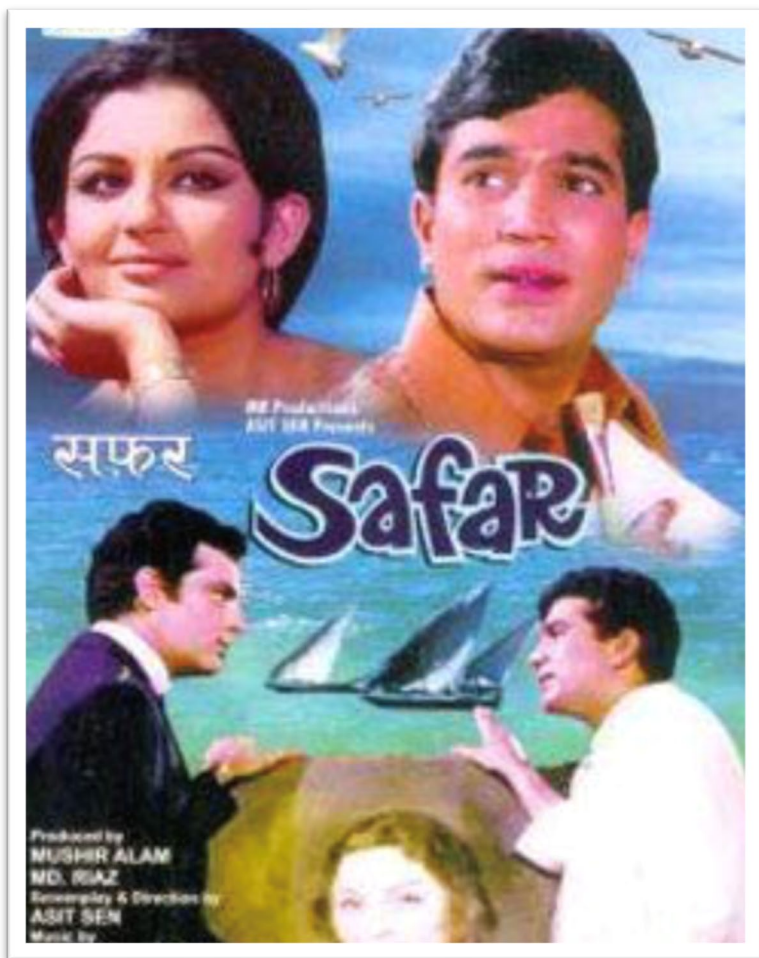
Thank you to my slum dog parents





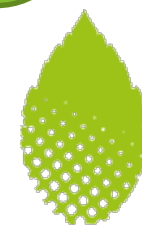
Its been an incredible journey....





“Zindagi ka safar: Hai yeh kaisa safar Koi samjha nahi Koi jana nahi”

“The journey of life: What kind of a journey is it? No one has understood that, No one comprehends that”



Thank you



www.leicesterdiabetescentre.org.uk



LeicesterDiabetesCentre



@LDC_Tweets



@kamleshkhunti