

Type 2 diabetes: Awareness and screening in the community pharmacy setting

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Article points

1. There is a high prevalence of undiagnosed diabetes and evidence of complications at diagnosis – both are strong imperatives for screening.
2. There is little evidence to support where or how screening could be effective.
3. An initial report on an exploratory screening programme indicates the health promotion benefits of using local pharmacists' community knowledge and contacts.
4. Initial findings suggest that community screening programs provides a means to enhance public awareness of the risk factors for type 2 diabetes.

Key words

- Opportunistic diabetes screening
- Risk assessment
- Pharmacist

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In Ireland, there are an estimated 147 000 people living with diabetes (Irish Diabetes Prevalence Working Group, 2006). With no national register of people with diabetes and no national policy on screening for diabetes, there are no records to indicate how many of this number remain undiagnosed. However, early detection of type 2 diabetes has been found to be a contributing factor in preventing microvascular complications associated with the condition and has some effect on reducing cardiac morbidity (Chaturvedi, 2007). In order to address these issues, screening for type 2 diabetes in pharmacies was piloted. The results of this screening programme are described below.

There is considerable scientific evidence supporting the effectiveness of lifestyle interventions in delaying the onset of type 2 diabetes and, in many cases, to prevent its onset (Knowler et al, 2002; Younis et al, 2004). This points to the clinical importance of detecting type 2 diabetes early and preventive strategies to reduce severity or delay the onset of the condition. People who would benefit from early detection or targeted for primary prevention might be identified in an 'opportunistic' encounter (Williamson et al, 2004).

Prevalence of undiagnosed type 2 diabetes is not often studied but in the US adult population it has been estimated that it is half the prevalence of diagnosed diabetes (Harris et al, 1998). Bourdel-Marchasson et al (2007) argue that in the case of the French elderly, undiagnosed diabetes is not related to access to medical attention. In Ireland, Smith et al (2003) found 83 new cases of diabetes

while examining the prevalence of diabetes among a cohort of 3821 people attending primary care physicians, equivalent to 2.2% of the studied population.

Community pharmacies are ideally placed to assist in the detection of undiagnosed diabetes, education of people with diabetes and referral of individuals for specialised care (Diabetes Federation of Ireland, 2002). Krass et al (2007) examined the risk of undiagnosed diabetes in 1286 people attending pharmacies in Australia over a 3-month period and found 996 people (77.5%) had risk factors to indicate they may have undiagnosed diabetes. A referral to their GP for future evaluation was issued to 343 of the individuals (26.7%). Of the 123 who underwent diabetes testing at their GP surgery, 22 (equivalent to 1.7% of the total number of people who presented at the pharmacy) were diagnosed with diabetes and 24 (equivalent to 1.9% of the total

number of people who presented at the pharmacy) had impaired glucose tolerance. Faced with such figures, it is not surprising that the World Health Organization promotes the need for opportunistic screening for type 2 diabetes (World Health Organization, 1999), a view endorsed by the Irish diabetes community (Diabetes Federation of Ireland, 2002).

Screening

The purpose of screening is to identify asymptomatic individuals who are likely to have diabetes (American Diabetes Association [ADA], 2004). Separate diagnostic tests using standard criteria are required after positive screening tests to establish a definitive diagnosis. The most appropriate method for screening for diabetes is not known (Engelgau et al, 2000).

Krass et al (2007) compared a tick-box method to sequential screening (see *Box 1*) and found the sequential screening to be more cost effective and efficacious. Rolka et al (2001) compared the performance of random capillary blood glucose (CBG) concentrations to detect diabetes against the 75g oral glucose tolerance test and found for a 6.7mmol threshold, the sensitivity was 84% and specificity was 88%, but acknowledged that variability was induced by age, sex and post-prandial time.

This level of sensitivity and specificity would not meet high-quality diagnostic test requirements; therefore CBG should not be used for official diagnosis of diabetes (Savoca et al, 2006). However, the level of false-positives with a threshold of a random CBG level >7.0mmol/l is acceptable when the purpose is to identify people who warrant further investigation (George et al, 2005).

Raising diabetes awareness in the community

In 2003, the Diabetes Federation of Ireland established a pharmacy-based diabetes health awareness and screening day. This service is now available to all pharmacies who wish to host a diabetes awareness day.

The objectives of the programme were to provide relevant health information in a local setting; access people with diabetes or

undiagnosed diabetes who do not attend for routine medical care; increase understanding and awareness of diabetes in the community; and raise the profile of the pharmacist as a local professional resource. The focus of the programme is two-fold: health promotion and providing specialised diabetes information.

Methods

The pharmacy organises the event by advertising in the local media, for example church notices and the local newspapers. A personal invitation is inserted into all prescription bags in the six weeks preceding the event.

People with known diabetes are invited to attend by the pharmacist when they collect their regular diabetes supplies and requested to urge their immediate family to use the assessment service. Those already diagnosed with diabetes are offered consultation in a private area with a Diabetes Federation of Ireland Diabetes Nurse Specialist. Many people with diabetes in Ireland attending primary care for their condition have no access to specialist nurses. This initiative offers them the opportunity for specialised diabetes nursing care. The individual identifies their concerns, which informs the nurse whether to base the consultation on either informative, educational or supportive advice.

On the day of screening, all other individuals have a diabetes risk assessment – a private screening area and a waiting area are provided with hand washing facilities available close by. The screening itself uses a modified version of the ADA risk assessment (ADA, 2004; Engelgau et al, 2000). The modification involves the risk factor pertaining to birth weight to account for Celtic origin (Diabetes Federation of Ireland, 2002). The ADA questionnaire had previously been reported as having 79% sensitivity, 65% specificity and a positive predictive value (the probability that a positive test reflects the underlying condition being tested for and represents the proportion of individuals with positive test results who are correctly diagnosed) of 10% in a representative sample of the US population (Herman et al, 1995). Risk is determined by the presence of more than one non-medical diabetes risk factor

Box 1. Definitions of tick-box screening and sequential screening.

Tick-box screening

In tick-box screening there is no capillary testing. Referral to a GP is based on the results of a risk assessment determined by ticking statements (similar to *Table 2*).

Sequential screening

Sequential screening allows all people with one risk factor for diabetes to have a capillary blood glucose (CBG) test. Referral to a GP occurs if the CBG concentration is greater than 6.0mmol/l when fasting or 7mmol/l when tested at a random time point.

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1. The purpose of screening is to identify asymptomatic individuals who are likely to have diabetes.
2. On the day of screening, individuals have a diabetes risk assessment using a modified version of the American Diabetes Association risk assessment.
3. All those at high risk are offered a CBG check using a CBG metre.
4. Abnormal results are rechecked and individuals referred to their GP for further investigation, with written information on the screening nature of the test.

Table 1. Diabetes risk assessment form completed by patients.

Circle the points next to each statement that applies to you and add up the total score.

	Yes	No
I am a woman who had diabetes during a pregnancy or had a baby weighing more than 4 kg (9 lbs) at birth.	3	0
I have a sister or a brother with diabetes.	1	0
I have a parent with diabetes.	1	0
My weight is equal to or above that listed in the At Risk Weight Chart provided by the pharmacist.	5	0
I am under 65 years of age and I get little or no exercise.	5	0
I am over 45 years of age.	5	0
I am also over 65 years of age.	5	0
Total		
3–9 points		
You are probably at low risk for having diabetes now. But don't forget about your risk which will increase with age. Therefore, keep your risk low by losing weight if you are overweight, being active most days and eating meals that are low in saturated fat and contain many vegetables and whole grain foods.		
>10 points		
You are at high risk for having diabetes. Only a healthcare professional can confirm whether or not you have diabetes by doing a simple finger prick test. The result is available immediately. All individuals will require laboratory tests to confirm diagnosis.		

(described in *Tables 1* and *2*). All those at high risk are offered a CBG check using a CBG metre. Written consent is obtained and confidentiality of results is assured. Abnormal results are rechecked and individuals referred to their GP for further investigation, with written information on the screening nature of the test (*Figure 1*).

All individuals who attend the session are informed of the increased risk of developing type 2 diabetes with age and the benefits of regular activity and healthy eating to minimise that risk (Eriksson et al, 1999; Tuomilehto et al, 2001). Health promotion leaflets on healthy eating, increasing fruit and vegetables in your diet, physical activity, smoking cessation and facts about diabetes were given to people who described unhealthy lifestyles during the risk assessment.

Results

The screening event reported here is the results from a single day held by a pharmacist in a

Table 2. The At Risk Weight Chart used during screening for people over 35 years of age.

This chart indicates unhealthy weights for men or women aged 35 or older at the listed heights. Check your height and if you weigh the same or more than the amount listed for your height, you may be at risk of diabetes and you score 5 in the diabetes risk assessment form.

Height without shoes		Weight without outdoor clothes	
Feet and inches	Cm	Lbs	Kg
4'10	147.5	129	58.6
4'11	150	133	60.5
5'0	152.5	138	62.7
5'1	155	143	65
5'2	157.5	147	66.7
5'3	160	152	69
5'4	162.5	157	71.3
5'5	165	162	73.5
5'6	167.5	167	75.8
5'7	170	172	78
5'8	172.5	177	80.3
5'9	175	182	82.6
5'10	177.5	188	85.4
5'11	180	193	87.6
6'0	182.5	199	90.3
6'1	185	204	92.6
6'2	187.5	210	95.3
6'3	190	216	98
6'4	192.5	225	100.3

small village in the south west of Ireland whose customers are mainly from a farming background. A radio interview on the risk factors for diabetes broadcast the day before highlighted the event. The people attended the pharmacy for routine business, because they had received a personal invite, or as a result of hearing about the day in the media. A total of 186 people attended, of which 21 (11.3%) had previously been diagnosed with diabetes. The most common topics raised by people already diagnosed with diabetes during their consultation with the diabetes nurse were: dietary information, blood glucose monitoring, availability of new devices, insurance and dealing

Page points

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with hypoglycaemia. The average length of consultations was 22 minutes.

The remaining 165 people were risk assessed for diabetes. Those over 45 years of age with no other risk factors were offered a test if they had no history of blood glucose testing in the last 3 years. In total, 105 were identified as eligible for a CBG test. Fifteen (14.3%) of these were found to have a random CBG >7.0mmols and were recommended to attend their primary care practice for further blood tests.

Characteristics of those presenting on one day

Ninety-seven women and 68 men without known diabetes presented for assessment. Increasing age and weight were the most common risk factors (*Figures 2 and 3*). Physical inactivity was equal between men and women, however younger women were more often overweight.

All people referred for further investigation had multiple risk factors and the importance of a full medical review was stressed by the nurse completing the test. There was no follow up to ascertain if they visited their GP.

Discussion

There is an assumption that raising diabetes awareness in the community will have a positive effect, yet there are no scientific studies into the effect. The referral rate at the diabetes awareness day is higher than in other reported studies (George et al, 2005; Tabaei et al, 2003). However, this may be attributable to the invitations issued (invitations are generally not in such studies, instead a convenience sample is taken) which may have created a bias towards higher risk categories.

This initiative is ongoing and the demand for it increasing. In 2006, 20 such events were hosted in pharmacies

throughout Ireland. The demand was greater but due to manpower issues, only 20 could be facilitated. The benefits of the nurse-led consultation are local availability of information, education or support in an informal non-clinical environment without interruptions. Verbal feedback confirmed that the attendees set their own agenda and felt that their time was as valuable as the healthcare professionals. Nurses at the community level are urged to utilise the knowledge and availability of the local pharmacist to set up regular community-based diabetes clinics.

Community screening in this manner may be less effective than screening in a healthcare setting because of the possibility that people with a positive screening result may not seek and obtain appropriate follow-up testing. In addition, there is no way of knowing if the people who present are from groups most at risk for diabetes or if the screening is targeting those who are more health conscious, at low risk, or even those already diagnosed but dispute or deny that diagnosis.

There are fewer arguments against the positive benefits of alerting people to their personal diabetes risk factors and how to minimise the risk. Only one-third of the people presenting on the day were of normal weight for their height and took 30 minutes of exercise each day (*Figure 3*). It is accepted that lifestyle modifications are beneficial in delaying the onset of type 2 diabetes (Tuomilehto et al, 2001) but there are no scientific studies that prove that informing people of the necessary behaviour changes results in sustained change. This may be due in part to the lack of clear criteria for evaluating the impact of health promotion strategies. To date, the only study known to the author to evaluate the effectiveness of population-based targeted diabetes prevention strategies is

the Fin-D2D project, with results not yet available (visit www.diabetes.fi/sivu.php?artikkeli_id=1726 [accessed 19.04.2007]).

The diabetes awareness incentive has proven very popular, with positive verbal feedback from people diagnosed in this manner and two GPs

who met the author. The screening provides a valuable health promotion opportunity by raising awareness of the risk factors for type 2 diabetes and ways of reducing personal modifiable risk factors in a target population. In addition, the screening events offer an opportunity to raise

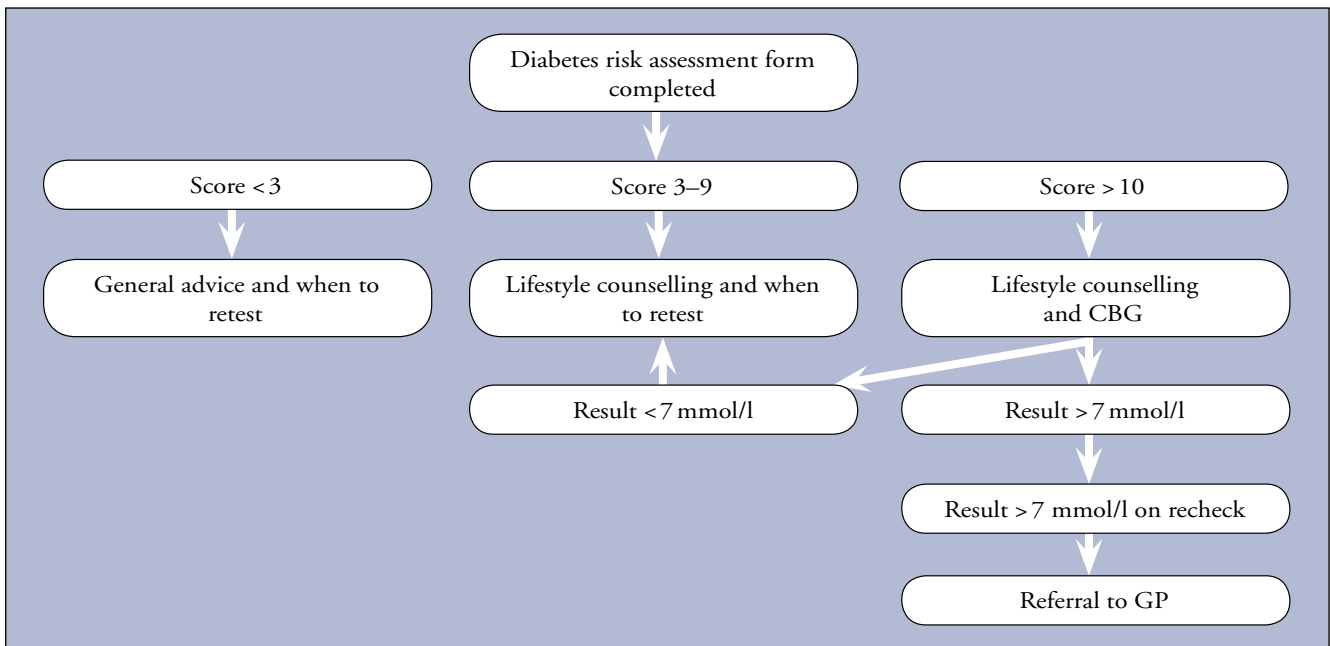


Figure 1. Procedures used during pharmacy-based screening.

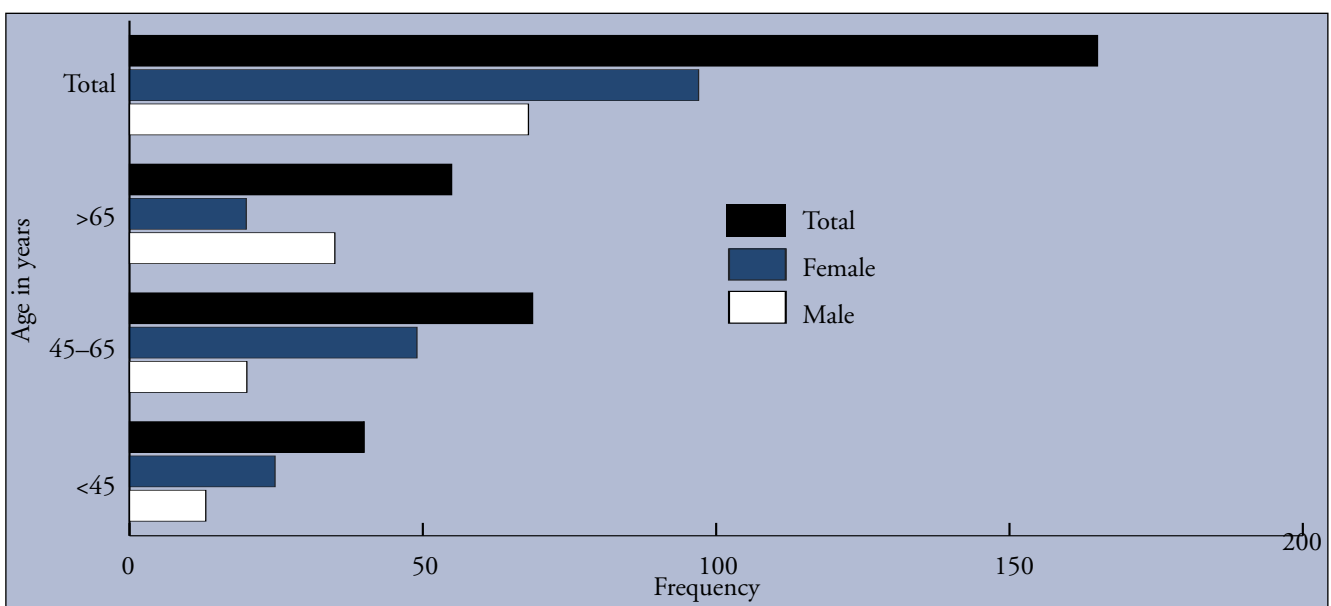


Figure 2. Age and sex of participants during the 1-day study.

Page point

1. Pharmacy-based diabetes screening could be used by local healthcare professionals to gain access to people who may be at high risk of undiagnosed diabetes or have undiagnosed diabetes that would not present in other medical settings.

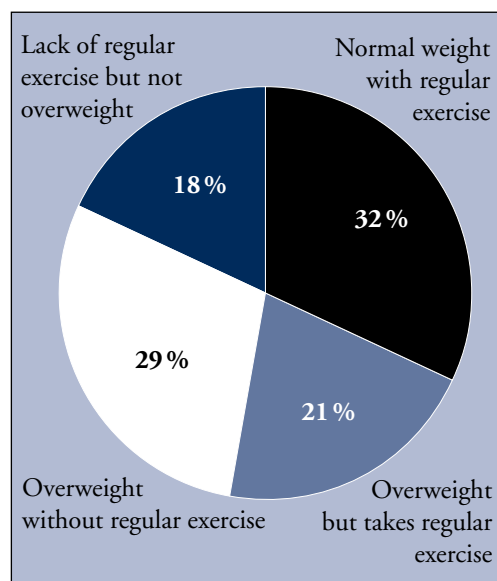


Figure 3. Percentage of participants by weight and regularity of exercise.

awareness of the risk factors for type 2 diabetes through local media and, therefore, may reach a larger and more receptive audience.

Pharmacy-based diabetes screening could be used by local healthcare professionals to gain access to people who may be at high risk of undiagnosed diabetes or have undiagnosed diabetes that would not present in other medical settings. In addition, this method targets the families of people with diagnosed diabetes to alert them to preventative strategies and as such is a valuable use of professional time. ■

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