Audit of microalbuminuria screening in primary care

Ambar Basu

Introduction

Microalbuminuria screening is recommended for patients with diabetes. Early detection of microalbuminuria leads to aggressive cardiovascular risk factor management and pharmacological intervention to delay or prevent progression to diabetic nephropathy. This article reports on an audit to assess the effectiveness of a district-wide, protocol-based screening programme for microalbuminuria. The findings suggest that the complexity of screening programmes makes them difficult to implement. Simpler programmes would yield better results.

In the UK, diabetic nephropathy is the most common cause of end-stage renal disease, accounting for 25-33% of dialysis patients (Berisa et al, 1989; Grenfell et al, 1992). Diabetic nephropathy develops in several stages over a period of 10-15 years (Williams and Pickup, 1996). It begins with micro-albuminuria (incipient nephropathy) (Mongensen, 1987), leads to overt proteinuria and results in progressive renal failure, dialysis and death if left untreated.

Microalbuminuria is albumin excretion rate (AER) between 20-200μg/min in a timed overnight urine sample. It is generally agreed that a patient is microalbuminuric if his/her AER is in this range on at least 2 out of 3 occasions over a period not exceeding three months.

The St Vincent working party recommendation (Krans et al, 1992) is that patients with type 1 diabetes aged over 12 years who have had diabetes for more than 5 years, and patients with type 2 diabetes aged under 70 years, irrespective of the duration of the disease, should be screened for microalbuminuria annually. Angiotensin-converting enzyme (ACE) inhibitors reduce the progression of microalbuminuria to proteinuria and, therefore, may reduce future prevalence of end-stage renal disease (Mathiesen et al, 1991). Detection of microalbuminuria also leads to aggressive cardiovascular risk factor management.

The screening programme

The district of Bolton is situated in the northwest of England and has a population of approximately 300000, 9000 of whom are people with diabetes.

A district-wide microalbuminuria screening programme was launched in 1997 with funding from the health authority. A protocol was devised and education provided for primary care and specialist care staff (Figure 1).

In primary care, all general practices were invited to take part, although participation was voluntary. Education and equipment were provided free to participants if audit data of urine results were returned.

Aims and objectives

The audit set out to establish whether a district-wide, protocol-based screening programme for microalbuminuria was effective. Its objectives were to assess the:

- Comprehensiveness of screening.
- Adherence to the protocol.
- Prevalence of microalbuminuria in Bolton.

Criteria

The criteria for screening were patients with type 1 diabetes diagnosed for more than 5 years and patients with type 2 diabetes aged under 60. The audit took place between January 1997 and December 1999.

The test used in the screening programme was a urinary dipstick reagent followed by AER calculation in a timed overnight urine sample in the laboratory (Gilbert et al, 1997).

ARTICLE POINTS

1 Microalbuminuria screening is recommended for patients with diabetes.

2 A district-wide microalbuminuria screening project was launched in Bolton.

3 The audit revealed difficulties in implementing the protocol-based screening programme both in primary and secondary care.

4 Simpler schemes are likely to yield better results.

5 Use of angiotensin-converting enzyme inhibitors should be encouraged in patients with diabetes.

KEY WORDS

- **Microalbuminuria**
- **Diabetic nephropathy**
- **Diabetes**
- **Albumin:creatinine ratio**
- **Audit**

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Data collection

Completed audit proforma were collected prospectively from primary care for patients who met the criteria for screening and were screened.

The list of patients in specialist care who met the criteria for screening was downloaded from the database of diabetes centre patients; every fifth case note from the list was reviewed manually retrospectively.

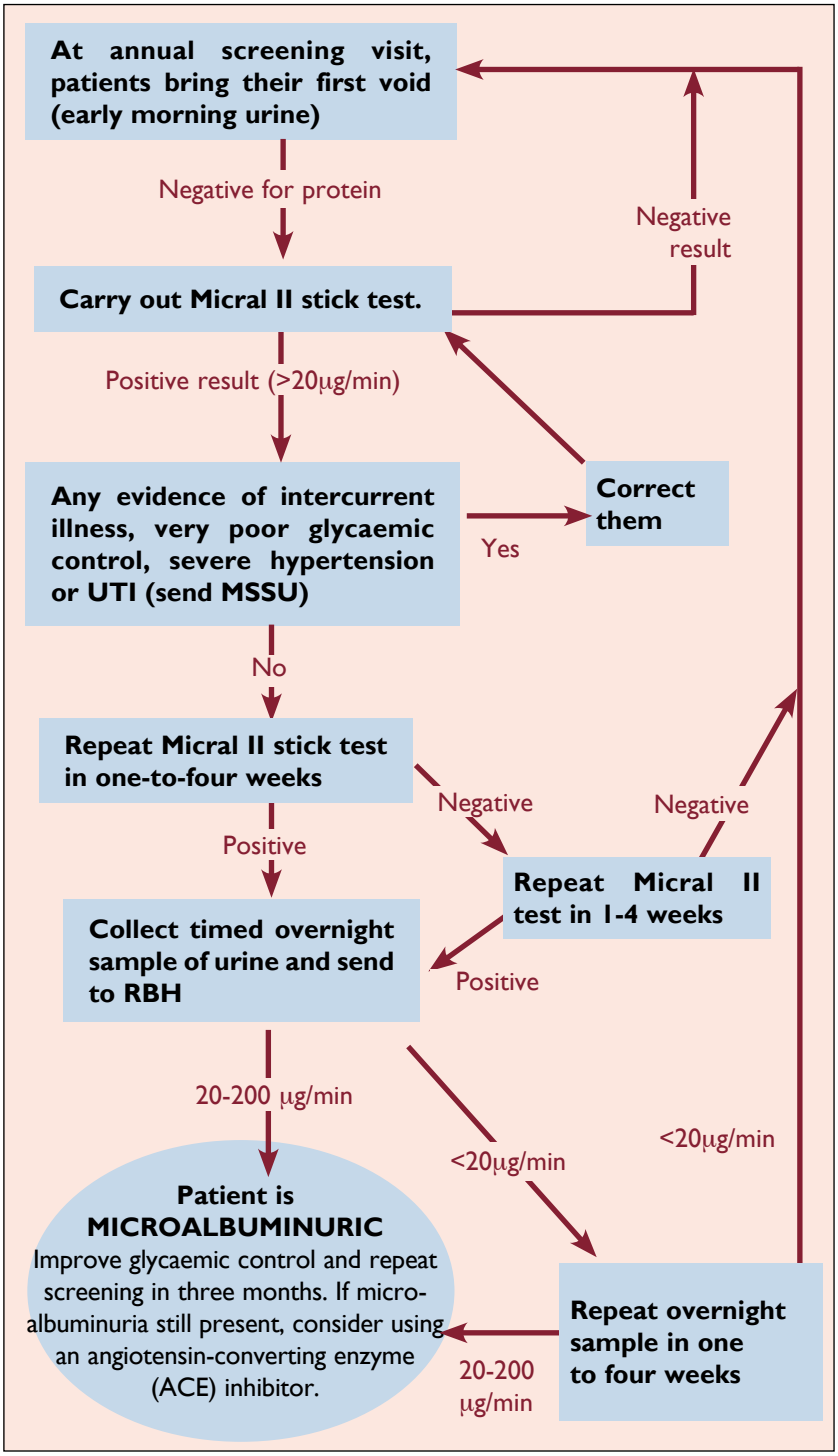

Figure 1. The screening programme undertaken in Bolton. Audit was performed between January 1997 and December 1999.

There are 82 practices in Bolton. Out of these, 43 expressed an interest in taking part in screening, 36 received training, 23 returned audit data; and 432 patients were screened in primary care.

There were 910 potential patients to be screened in secondary care. Out of these, 182 case notes were reviewed and 122 patients (67%) were screened.

Results

The results are shown in the flow charts for primary and secondary care (Figure 2).

In primary care, 26% of those who commenced screening and 62% whose first screening test was positive, did not complete the screening protocol.

In secondary care, 19% of those screened and 44% of those whose first screening test was positive, did not complete the screening protocol (Figure 2).

In primary care, 23 patients were identified as microalbuminuric. In secondary care, 14 patients were identified as microalbuminuric.

Limitations

In primary care, there was a relatively smaller number of patients per practice making screening less effective. Identifying the patient group for screening was difficult because of the difference in eligibility criteria for type 1 and type 2 diabetes. The request for urine samples for screening was less productive.

In specialist care, patients with type 2 diabetes were more frequently not screened at diagnosis. If any individual failed to bring a sample of urine for testing, a repeat request for another sample was again less productive.

Discussion

Participation of general practices in the audit was not universal. This resulted in underestimation of the prevalence of microalbuminuria in the district. Both in primary and secondary care, a significant number of patients who warranted screening did not receive screening.

The results suggest that although screening for microalbuminuria in patients with diabetes is advisable, in reality it proves to be difficult. The main reason for non-adherence was the complexity of the protocol. Compliance was a factor: patients had to

bring several samples of urine at different times; furthermore, this was not always timed with their clinic appointments. The different criteria for screening eligibility in type 1 and type 2 diabetes also caused confusion, and as a result, some patients eligible for screening may not have been screened.

One of the basic tools needed to run a successful screening programme is a recall system. This was lacking in the protocol. The way forward will be to simplify the protocol. This could mean that laboratory estimation of albumin:creatinine ratio (Connell et al, 1994; Warram et al, 1996) for all samples requested at the recall for other screening, e.g. retinal,

Figure 2. Flow charts showing the outcome of microalbuminuria screening in primary care (top) and secondary care (bottom).

Biochemist in the process of analysing albumin in urine using an autoanalyser.

foot and lipids, might simplify the scheme. This would have to be audited both in primary and secondary care.

Conclusion

The audit showed that the combination of dipstick screening followed by laboratory estimation of AER resulted in a large number of patients being inadequately screened both in primary and secondary care. Simpler screening is required and could be linked to other recall systems for screening.

More importantly, the effects of ramipril in patients with diabetes and other cardiovascular risk factors (e.g. cholesterol>5.2mmol/l; HDL cholesterol ±0.9mmol/l; hypertension; known microalbuminuria or current smoker) (HOPE, 2000), demonstrate that these patients should take an ACE inhibitor as a cardioprotective and renoprotective agent.

One of the main reasons for microalbuminuria screening is for predicting renal and cardiovascular risk in diabetes, which would be modified by an ACE inhibitor. In the light of this and the difficulty in implementing a protocol-based screening programme, the appropriateness of these programmes both locally and nationally has to be determined. ■

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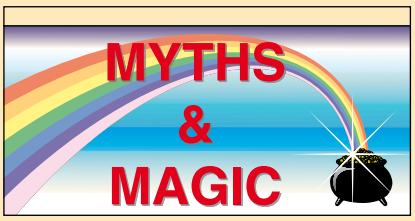
THE MAGIC EFFECTS OF EXERCISE



Have you noticed that whenever the subject of 'exercise' is raised in the consultations, the usual response is either an instant glazing of the eyes or a cheery 'Well, I get plenty of that running up and down those stairs all day.'

Of course, the medical profession has always advocated exercise for its health benefits, but what evidence do we have for this, particularly in relation to type 2 diabetes? Well, up until recently, precious little. However, over the past five years, several important studies have been published, demonstrating positive effects.

The Malmo study in Sweden investigated exercise modification in 181 male subjects with impaired glucose tolerance (IGT). The Da Qing study looked at 577 IGT subjects. In both studies, exercise intervention led to a reduction in risk of developing diabetes.

In May 2001, the Finnish Diabetes Prevention Study Group published a study in the *New England Journal of Medicine* providing evidence that type 2 diabetes can be prevented by lifestyle change in high risk individuals. The overall incidence of diabetes was reduced by 58% following individualised counselling on physical activity and diet.

So what are the benefits?

- Weight reduction
- Increased insulin sensitivity
- Improved lipid profile (reduced triglyceride, increased high-density lipoprotein cholesterol)
- Reduced blood pressure.
- Reduced coronary events.
- Reduced progression of IGT to type 2 diabetes.
- Reduced stress.

Perhaps part of the problem lies with health professionals themselves. Exercise advice tends to be rather vague, and proferred in a semi-apologetic tone. Benefits from the studies mentioned above have related to specific, tailored programmes. We need to get off the fence and be more upbeat in our attitude, especially in the face of rapidly accumulating evidence. The next issue of *Diabetes and Primary Care* will tell you how!

Hippocrates