

Erectile dysfunction in diabetes populations in Torbay: Prevalence, predictors and attitudes

Helen Lockett, Rob Bromige, Jamie Smith

Recent changes in diabetes service provision in the UK have led to the shift of diabetes care from hospital-based specialist clinics to primary care. In Torbay, diabetes complication surveillance is now exclusively performed in primary care. Many such annual review programmes are in their infancy and their impact on complication screening with respect to erectile dysfunction (ED) is unknown. Questionnaires involving 465 men with diabetes and 48 GP diabetes leads were used to: explore differences between prevalence and clinical predictors of ED in primary and secondary care diabetes clinics; determine the frequency of ED treatment success and failure; and assess patients' and healthcare professionals' attitudes towards the issue of ED surveillance during annual review. The results of this study are presented and discussed.

Erectile dysfunction (ED) is a frequent but often neglected complication of diabetes (Chaudhuri and Wiles, 1995; Chu and Edelman, 2002) despite the fact that it is known to cause significant morbidity, being associated with low self esteem, poor quality of life, relationship difficulties and overt depression (Richardson and Vinik, 2002; Basu and Ryder, 2004; Jackson, 2004a). Although proven and effective ED therapies are available, underdiagnoses of ED in diabetes remains common (Chu and Edelman, 2002). This has occurred because men with diabetes are often reticent to express their problem to healthcare professionals, or because there is reluctance on the part of healthcare professionals themselves to discuss this issue with their patients

(Dunsmuir and Holmes, 1996).

The National Service Framework (NSF) for diabetes suggests that there should be regular surveillance and effective management of erectile dysfunction in men with diabetes, although there are no specific guidelines or suggestions regarding the most appropriate method of surveillance. The NSF also states that there should be a review of local provisions for detection and management of ED in diabetes.

Modernisation of diabetes care has seen a shift from hospital-based diabetes clinics to primary care; and hence, annual surveillance of complications is being increasingly performed in primary care. In many areas of the UK, primary care annual review programmes are

Article points

1. In this study, questionnaires were used to assess prevalence and predictors of ED, and attitudes towards the issue.
2. Severe ED was present in a third of individuals with no apparent differences between primary and secondary care diabetes clinics, and was often present in the absence of other complications.

Key words

- Erectile dysfunction
- Prevalence
- Attitudes

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1. The National Service Framework (NSF) for diabetes suggests that there should be regular surveillance and effective management of erectile dysfunction in people with diabetes.
2. Modernisation of diabetes care has seen a shift from hospital-based diabetes clinics to primary care.
3. The aim of this study was to determine the local prevalence of ED in our primary and secondary care patients with diabetes, determine the frequency of ED treatment success and failure, and investigate the differences between hospital- and GP clinic-based care.
4. Questionnaires were sent to 465 people with diabetes and 48 primary care clinical diabetes leads.

in their infancy and there has been little study of the impact of primary care annual review clinics on surveillance of diabetes complications such as ED.

In Torbay, there is no systematic community-wide surveillance programme for diabetes-related ED and no dedicated service for men suffering from both ED and diabetes. Therefore, the aims and purpose of the present study were as follows.

- To determine the prevalence of ED in the primary and secondary diabetes care teams.
- To determine the frequency of ED treatment success and failure.
- To assess patients' attitudes to the problem of ED including the issue of ED surveillance during annual review.
- To investigate whether or not differences existed between the prevalence and clinical predictors of ED in a hospital-based diabetes clinic compared with a relatively large GP diabetes clinic.

Methods

The study involved 465 males with diabetes (type 1 or 2) between 30 and 70 years of age residing in the Torbay area. All males fitting this criteria and attending a consultant-led hospital clinic at Torbay Hospital (n=275) or

receiving diabetes care at a GP-led clinic in a local GP practice (Compass House General Practice, Brixham, Devon; list size: 11 562; 459 with diabetes and 190 men eligible for the study) were invited to complete a postal questionnaire. The questionnaire incorporated an abridged version of the International Index of Erectile Function (IIEF), a validated tool designed to assess erectile function and grade the severity of ED (Rosen et al, 1999). A score of less than 10 indicates severe ED, whereas a score of 20 or above is considered to predict normal function. In addition, the questionnaire requested details of ED treatments received and response to treatments, and attitudes towards healthcare professionals' approach to ED screening and the local provision of ED services. Individual clinical data collected included the co-existence of other complications of diabetes and physical and metabolic parameters. The latter were obtained from hospital and GP medical records.

In addition, all primary care clinical diabetes leads (n=48) in the Torbay area were invited to complete a separate questionnaire designed to evaluate their approach to managing ED, including personal attitudes and method of screening for diabetic ED.

Ethical approval was obtained from the South Devon Research Ethics Committee.

Statistical analysis

All statistical analyses were performed using SPSS (version 9.0) for Windows. Data are expressed as mean values ± SD for normally distributed values.

Results

Out of 465 patient questionnaires sent out, 226 were returned giving a response rate of 49% (133 out of 275 [48%] for those treated in a hospital clinic versus 93 out of 190 [49%] for people treated in a GP practice). Patient characteristics for both clinic populations are shown in *Table 1*. As expected, there were important differences between groups. The hospital group included a greater proportion of people with type 1 diabetes, and those receiving insulin therapy. In addition, the frequency of

Table 1. Comparisons between both clinic populations for disease characteristics.

Characteristic	Hospital diabetes clinic (n = 133)	GP diabetes clinic (n = 93)
Age (years)	56 ± 12**	63 ± 7
Body mass index (kg/m ²)	28.7 ± 4.7	29.3 ± 4.2
Duration of diabetes (years)	14 ± 12**	8 ± 8
Type 1 diabetes (%)	34**	12
Type 2 diabetes (%)	63**	85
Insulin treated (%)	76**	25
Systolic blood pressure (mmHg)	144 ± 21**	136 ± 13
Diastolic blood pressure (mmHg)	80 ± 12	78 ± 7
Total cholesterol (mmol/l)	4.6 ± 1.1*	4.2 ± 0.9
HDL cholesterol (mmol/l)	1.4 ± 0.4	1.3 ± 0.37
Triglyceride (mmol/l)	2.3 ± 1.9	2.2 ± 2.5
HbA _{1c} (%)	8.8 ± 1.5**	7.6 ± 1.6
Hypertension (%)	53*	35
Ischaemic heart disease (%)	26	20
Diabetic retinopathy (%)	40	36
Micro-/macroalbuminurea (%)	19*	13
Active or previous smoking (%)	27*	40

*P<0.01; **P<0.001; Diabetes of unknown aetiology – 3% in each column

Page points

1. The hospital group included a greater proportion of people with type 1 diabetes, and those receiving insulin therapy.
2. The frequency of microvascular and macrovascular complications was greater in the hospital group, as was the duration of diabetes.
3. There were no differences between clinic populations with respect to erectile function.
4. The presence of ischaemic heart disease was associated with worse erectile function but the presence of retinopathy, hypertension, albuminuria or smoking history was not associated with statistically significant differences with respect to erectile function.
5. Of all people in both groups, 72% indicated that they had never been asked about erectile problems at diabetes consultations or annual review visit.

microvascular and macrovascular complications was greater in the hospital group, as was the duration of diabetes. Important clinical parameters, including systolic blood pressure and HbA_{1c}, were elevated in the hospital group compared with the GP clinic. Mean age was greater in the GP group.

Erectile function, as indicated by the IIEF score and grading of erectile function, are shown in *Table 2*. There were no statistical differences between clinic populations with respect to erectile function. Comparisons in erectile function were made according to complication status. These results are shown in *Table 3*. The presence of ischaemic heart disease was associated with worse erectile function ($P<0.05$) but the presence of retinopathy, hypertension, albuminuria or smoking history was not associated with statistically significant differences with respect to erectile function.

For continuous variables, stepwise multiple regression analysis was applied in order to determine the key clinical predictors of erectile dysfunction. In this model, erectile function (IIEF score) was the dependent variable and the following were independent variables: diabetes duration, age, body mass index, HDL cholesterol, triglyceride, HbA_{1c}, total cholesterol and systolic blood pressure. Age (Beta -0.25; $P<0.01$) and HbA_{1c} (Beta -0.23; $P<0.01$) were the strongest predicting variables of erectile function in this analysis.

Given the knowledge that age was an important determinant of erectile function, we controlled for age by dividing primary and secondary care populations into tertiles according to age. IIEF scores were compared across age-matched groups. In this analysis, there were no statistically significant differences in IIEF scores across the three tertiles.

Of all men in both groups, 72% indicated that they had never been asked about erectile problems at diabetes consultations or annual review visit; 30% of the hospital group had been asked versus 24% of the GP clinic group ($P=0.093$). Of all individuals, 26% claimed to have received a diagnosis of erectile dysfunction from a healthcare professional. These included a greater proportion of hospital

Table 2. Comparison of erectile function in both clinic populations.

	Hospital	GP
IIEF score	13.9 ± 7.5	13.3 ± 8.0
Normal (%)	30	30
Mild–moderate ED (%)	38	36
Severe ED (%)	31	33

patients versus GP clinic patients (29% versus 23% respectively; $P<0.05$). People were usually offered phosphodiesterase inhibitors to treat ED. Two individuals were given penile injections and one was started on gabapentin. The latter antiepileptic is used commonly for neuropathic pain in diabetes but is not a recognised treatment for ED. Treatment failure of ED (as adjudicated by the patient) was very common with 58% of individuals experiencing treatment failure (for instance, specific ED therapy never successful or usually unsuccessful). Success of treatment (effective in more than 50% of occasions) was experienced in 21% of people and moderate success (effective approximately 50% of the time) was experienced in 21%.

The majority of hospital (69%) and GP patients (67%) indicated that they would wish to be proactively and routinely asked about erectile difficulties during the annual review visit. An explanation for their feelings was offered by some individuals and can be seen in *Box 1*. Only a minority of hospital patients (4%) and GP patients (3%) indicated that they would not wish to be routinely asked about erectile problems at annual review. A total of 64% of individuals indicated that they would be comfortable discussing erectile problems with a healthcare professional of either sex; whereas 22% would rather discuss the matter with a male healthcare professional than female.

Table 3. Erectile function according to presence or absence of disease category.

	Present	Absent
Hypertension	13.1 ± 7.5	13.9 ± 7.9
Ischaemic heart disease	11.3 ± 8.0*	14.1 ± 7.5
Retinopathy	12.8 ± 7.5	14.1 ± 7.8
Albuminurea	11.6 ± 6.8	14.1 ± 7.9
Smoking	13.2 ± 8.0	13.8 ± 7.5

* $P<0.05$

Of the 48 questionnaires mailed to diabetes primary care leads in the Torbay area, 35 were returned with a response rate of 73%. In total, 52% of practices routinely inquired about erectile dysfunction during the annual review process (for example, they included a specific question on their annual review template).

Discussion

In our local healthcare community, the prevalence of ED associated with diabetes is common and comparable with other studies of ED prevalence in diabetes (Chu and Edelman, 2002; Kloner, 2004). We have demonstrated that ED prevalence is equivalent in both primary and secondary care diabetes clinic populations, even though the secondary care population had a longer duration of diabetes, poorer glycaemic control and a higher rate of micro- and macrovascular complications. Furthermore, ED was often present as an early complication of diabetes in the absence of other complications. The strongest predictor of erectile function in our patients was age, with glycaemic control (as indicated by HbA_{1c}) also being an important predicting variable. Other studies have shown that the prevalence of ED increases with age; however, in men with diabetes, the onset is at a younger age than those without diabetes (Chu and Edelman, 2002; Kloner, 2004; Ledda, 2000).

The present study also suggests that ED is particularly common in the presence of macrovascular disease (such as coronary heart disease) but a less obvious relationship with microvascular complications (retinopathy or nephropathy) was observed. Indeed, previous studies have also identified a strong link between ED and cardiovascular disease states, with evidence that ED may in some circumstances represent an early manifestation of atherosclerotic disease (Richardson and Vinik, 2002; Montorsi et al, 2004; Dusing, 2005). Furthermore, there is also evidence of a strong and independent association between ED and silent coronary artery disease in apparently uncomplicated type 2 diabetes patients (Jackson, 2004a; Gazzaruso et al, 2004). Given that silent coronary artery disease

is a powerful predictor of early death in people with diabetes (Das, 1989), the identification of ED in diabetes is likely to provide useful information in terms of risk stratification.

The vast majority of individuals in our study felt that ED should have a higher profile within the NHS with expansion of ED services. They suggested that questions about ED should be specifically included in their annual diabetes review by default, with most being happy to discuss this issue with a male or female professional. Most people also indicated that they would feel comfortable discussing erectile issues with female healthcare professionals. In reality, the majority of people in this population had never been asked about symptoms of ED by anyone. Perhaps this explains why only a quarter of individuals had received a diagnosis with ED, whereas three-quarters had an IIEF score indicative of ED. There is evidence that people who do not volunteer symptoms of ED do not pursue treatment (Alexander, 1990). In this sample, the majority of people wish to be asked about ED and only 4% of hospital-based patients and 3% of GP patients would not want a routine enquiry about ED at their annual review. This suggests that although many men with symptoms of ED do not volunteer information they would do so if invited by the healthcare professionals. Furthermore, of those who were offered treatment, the vast majority accepted it (90%). Many individuals felt that treatment for ED would improve their quality of life and were keen to be offered treatment, as shown by a sample of comments in *Box 1*.

People regarded erectile problems as a high priority, they felt that with some justification,

Page points

1. The majority of hospital (69%) and GP patients (67%) indicated that they would wish to be proactively and routinely asked about erectile difficulties during the annual review visit.
2. In total, 52% of practices routinely inquired about erectile dysfunction during the annual review process.
3. ED prevalence is equivalent for both primary and secondary care diabetes clinic populations, even though the secondary care population had a longer duration of diabetes, poorer glycaemic control and a higher rate of micro- and macrovascular complications.
4. The vast majority of individuals in our study felt that ED should have a higher profile within the NHS with expansion of ED services.

Box 1. Reasons people thought ED should be offered a higher profile.

- 'I think this topic should be discussed more, as if not treated it can lead to depression, stress and other problems.'
- 'This is why my wife is divorcing me.'
- 'Had a PDE-5 inhibitor which didn't work. No sex for 6 years. Embarrassed to discuss problem and no help offered.'
- 'Please help! Have had a PDE-5 inhibitor but found it unsatisfactory.'
- 'It would be much easier if the consultant or medical team broached the subject first.'
- 'A refreshing change that personal issues are on the agenda. It has always been difficult to raise the subject at general interviews in clinic.'

Page points

1. In the present study, the treatment failure rate of 58% was much higher than might be expected.
2. The underlying reasons for this, according to patients' comments, include insufficient instructions offered to the individual regarding use of the treatment and inadequate follow up.
3. The present study has highlighted deficiencies with respect to ED surveillance, assessment and treatment.
4. Given that ED is so common, even in apparently 'milder' forms of diabetes, and especially as it rates as a high priority for many diabetic men, more attention should be focussed on this forgotten complication of diabetes.

this problem was neglected by healthcare professionals. Perhaps this is due to several factors. Many healthcare professionals may feel uncomfortable raising this sensitive and personal issue when not prompted by the patient. Others may focus the consultation on measurable parameters such as HbA_{1c}, blood pressure and cholesterol. Some may not appreciate ED as a common complication of diabetes or choose not to look for ED owing to a lack of confidence and experience in treating this condition. Nurses with a specialist interest in diabetes may wish to develop their skills in the management of ED as they often perform part of the annual review process and usually have developed a close professional relationship with their patients. They may be the most appropriate people to enquire about ED and demonstrate the treatment options. Reluctance by healthcare professionals to address the problem of ED may also account for the high failure rate of treatment in those with a prior diagnosis of ED. It is expected that erectile function should be restored in up to 80% of individuals with minimal adverse effects (Jackson, 2004b). In the present study, the treatment failure rate of 58% was much higher than might be expected. The underlying reasons for this, according to patients' comments, include insufficient instructions offered to the individual regarding use of the treatment and inadequate follow up, particularly following the prescription of oral phosphodiesterase-5 inhibitors.

The questionnaire response rate was 49%. Although this may be considered a poor response, a sensitive subject was being addressed. Furthermore, there was no obvious medical or financial gain offered to the participants. There was no support from pharmacological companies. It was felt that the responding sample was sufficient to reflect the local population.

The NSF for diabetes recommends that erectile function is assessed on an annual basis as part of the comprehensive diabetes review each individual should receive. In our local healthcare community of Torbay, which is semi-rural, primary care diabetes services

are relatively well developed in line with NSF standards. All diabetes annual review is undertaken in primary care and the majority of GP practices independently initiate insulin therapy in type 2 diabetes. Despite this, the present study has highlighted deficiencies with respect to ED surveillance, assessment and treatment, and we feel that this situation is probably replicated in many areas of the UK. Given that ED is so common, and especially as it rates as a high priority for many men with diabetes, more attention should be focussed on this complication of diabetes. ■

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