

Epidemiology of erectile dysfunction

M Kubin^{1*}, G Wagner² and AR Fugl-Meyer³

¹Bayer AG, Pharma Research Centre, Wuppertal, Germany; ²Division of Sexual Physiology, Rigshospitalet, Copenhagen, Denmark; and ³Department of Neuroscience, Rehabilitation Medicine, University of Uppsala, Sweden

This review of the current epidemiological literature on erectile dysfunction (ED) suggests that approximately 5–20% of men have moderate-to-severe ED. Different definitions of ED, age distributions and concomitant medical conditions, as well as methodological differences, may explain much of the variance in reported prevalence rates. Various chronic disorders are associated with elevated rates of ED including depression, diabetes, and cardiovascular and neurological diseases. Such disorders are more common in the elderly, which may partially explain the elevated prevalence of ED in men over 60 y of age. Currently, up to 70% of men with ED are not treated. However, so many men experience considerable distress from their condition, that the increasing awareness of ED as well as the availability of noninvasive treatments may result in a greater proportion of patients seeking treatment, and eventually regaining satisfaction with their sex life.
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Introduction

In this review, we aim to provide information on the prevalence of erectile dysfunction (ED) in the general populations of different countries, allowing generalisation of findings at the given population level. It complements the recently published systematic reviews by Lewis *et al*¹ and by Simons and Carey,² which both showed the heterogeneity of the published evidence. In addition, the prevalence of ED in groups with major comorbidities and its impact on the health-care system is discussed.

ED has been broadly defined as the inability to achieve or maintain an erection sufficiently rigid for satisfying sexual intercourse.³ ED can have a profound negative impact on the quality of life and life satisfaction of the patient (and his partner), resulting in fear, loss of self-image and self-confidence, and depression.^{4–7}

While some attention has been given to the potential impact of the introduction of oral treatments for ED,^{8,9} the nondrug costs of ED to the health-care systems remain unknown. Reimbursement for ED treatments have been rejected on the

basis of assumed large prevalence rates, ignoring the fact that ED treatment rates may be much lower. Moreover, several studies have shown the economic efficiency of treating ED,^{10,11} that is, treatment for ED can buy much improvement in quality of life for a given budget.

When assessing the overall impact of a condition, epidemiological data are the cornerstone. Early insights were gathered by Kinsey in 1948.¹² Epidemiological studies on ED using modern techniques appeared in the 1980s and several more have been published since.^{1,2,13} Comparisons of studies are, however, difficult because the terminology used to describe ED is inconsistent. This has led to conceptual confusion and difficulties in comparing published results. Consequently, in 1993, the NIH Consensus Development Panel recommended a more precise term of ED.³ This definition, however, encompasses three different categories: the inability to achieve an erection, the inability to maintain penile erection, and somewhat inconsistently, the notion of satisfaction with sexual performance. A number of different classifications have subsequently been used, such as those by Feldman *et al*,¹⁴ Rosen *et al*,¹⁵ Fugl-Meyer and Fugl-Meyer¹⁶ and Béjin.¹⁷

Special problems associated with epidemiological studies of ED include different age strata and (self-) selection bias. In addition, a variety of methodological approaches have been employed to elicit the answers, which again may bias a study.¹⁸

*Correspondence: Dr M Kubin, Bayer AG, Pharma Research Center, 42096 Wuppertal, Germany.
E-mail: maria.kubin.mk2@bayer-ag.de
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Studies of the prevalence of ED can be categorised into: nationally representative studies, regionally representative studies or selected, often clinical, series. The first two methods draw their representative samples from the population, and are generally forced to rely on self-reports of a condition. Selected clinical studies may focus on patients who consult a particular clinic, patients with a particular illness, patients who have been exposed to specific treatments, or other groups who may be expected to have a likelihood of having ED. They however give little or no information on the prevalence in the general population.

Population prevalence—current estimates and comparisons

Most epidemiological studies of ED have measured the prevalence of the condition. There is, to our knowledge, only one report on the incidence of ED that has an epidemiological approach.¹⁹ Hence, it is not possible to estimate whether the number of men with ED is increasing or decreasing.

Europe

In 741 Danish men aged 18–88 y, Ventegodt²⁰ assessed that 5.4% of men reported decreased ability to achieve an erection (Table 1). The prevalence was relatively constant at about 2% for all age groups up to the mid-40-y olds, but was

nearly 18% in those aged 58–88 y (Table 2). While ED seems to have a significantly negative effect on the quality of life in the younger age groups, this effect diminishes to almost zero in the group aged 58 y or above. The study did not ask for difficulties maintaining an erection and thus may have underestimated the total prevalence.

The impact of questionnaires vs interviews was highlighted in a small, but regionally representative group of 51-y-old Danish men.¹⁸ In the questionnaire, 5% reported more than occasional ED (Table 1), and an additional 15% indicated rare ED. However, a subset of 100 men who had not reported ED in the questionnaire were subsequently interviewed by their own physician: now 7% of them had moderate-to-severe ED and a further 19% had occasional impairment of erections.

In a Finnish large-scale national combined face-to-face and questionnaire study,²¹ 996 male respondents (aged 18–74 y) reported an overall 6% prevalence of erection difficulties at least fairly often, while 49% had experienced erection difficulties of any degree during the previous year. Men's erectile ability appeared at its best around the age of 30 y, with only 1% of men reporting erectile difficulties fairly often. This increased to 32% for men aged 65–74 y. Similarly, at age 30, 65% of men experienced no erectile difficulty, this fraction was 40% at age 50, 20% at age 70. A total of 15% of men had had erectile difficulties for an extended period during their life. In men aged 70 y or older, this lifetime prevalence amounted to over 50%. The survey also asked females about males erectile disabilities. They tended to report partners' ED somewhat more frequently, with an overall prevalence of 9%.

Table 1 Prevalence of mild and moderate-to-severe ED from selected epidemiological studies

Study	Responders (n)	Total (N)	Age range (y)	Prevalence of ED (%)	
				Mild ^a	Mod/Severe ^a
Europe					
Ventegodt ²⁰	741		18–88		5
Solstad and Hertoft ¹⁸	439	542	51	15	5
Kontula and Haavio-Mannila ²¹	996	1924	18–74	49	6
Fugl-Meyer and Fugl-Meyer ¹⁶	1475		18–74	29	5
Malmsten <i>et al</i> ²²	7738	10 458	≥ 45		8
Braun <i>et al</i> ²³	4883	8000	30–80	23	19
Meuleman <i>et al</i> ²⁵	1233		40–79		13
Virag and Becky-Ardilly ²⁸	1037		18–70	28	11
Bejin ¹⁷	20055		18–69	28	19
Martin-Morales <i>et al</i> ²⁹	1857		25–70	16	3
USA					
Feldman <i>et al</i> ¹⁴	1290	1709	40–69	17	35
Panser <i>et al</i> ³⁰	2115	5135	40–79		12
Laumann <i>et al</i> ³¹	1244	1410	18–59		10
Australia					
Pinnock <i>et al</i> ³²	392	612	>40		23

^aAs interpolated from the reports.

Table 2 Age-related prevalence of ED from selected epidemiological studies

Study	n	Prevalence of moderate/severe ED (%) in different age groups					
		20–29	30–39	40–49	50–59	60–69	70–79
Braun <i>et al</i> ²³	4883		2	9	16	34	53
Meuleman <i>et al</i> ²⁵	1233			6	9	22	38
Laumann <i>et al</i> ³¹	1410	7	9	11	18		
Pinnock <i>et al</i> ³²	392			7	10	36	57
		20–44				58–88	
Ventegodt ²⁰	741		2			18	
		18–24	25–34	35–49	50–65	66–74	
Fugl-Meyer and Fugl-Meyer ¹⁶	1475	3	2	2	7	24	
		30		45–54	55–64	65–74	
Kontula and Haavio-Mannila ²¹	996	1		7	16	32	
		20–24	25–34	35–44	45–54	55–69	
Béjin ¹⁷	20055	12	14	19	24	29	
			25–39			60–70	
Martin-Morales <i>et al</i> ²⁹	1857		4				
		40–44	45–49	50–54	55–59	60–64	65–69
Feldman <i>et al</i> ¹⁴	1290	22	28	30	35	41	49

A similar prevalence was reported in a Swedish national study to 18 to 74-y-old men (Table 1),^{7,16} using a method very similar to the Finnish one. While less than 0.5% of 1475 male respondents to the study had complete erectile failure at (attempted) intercourse during the past 12 months, approximately 5% reported erectile disabilities at least quite often, 9% quite rarely, 21% hardly ever and 66% never. Among the men with ED, about two-thirds felt that the disability caused them distress and among those 75% had a low level of sexual satisfaction. Among women from the same age strata, 4% perceived that their partner had ED, 74% of these felt that it caused them distress while 82% had a low level of sexual satisfaction.

In another study from Sweden, Malmsten *et al*²² included questions regarding impotence in a questionnaire mailed to over 10 000 randomly selected men aged 45 y or older. ED was reported by 8% of respondents and was found to increase linearly with age up to 80 y. While 2% of men 45 y reported the condition, this increased to 18% for men aged 80 y. The proportion of men who remained sexually active fell linearly from 76% at age 45 y to about 17% at age 80 y.

A German regionally representative study²³ employed a questionnaire that had been correlated with tumescence measurements in a validation study.²⁴ The overall prevalence of ED in at least half of sexual attempts among the 4900 responders aged 30–80 y was 19% (Table 1). Men were asked whether they were dissatisfied with current sex life, and only 7% of the total cohort reported both ED and a dissatisfaction with sex life. This correlation showed a downward trend, with 61% of ED men aged 30–39 y being dissatisfied, but only 14% of those aged 70–79 y.

In a regional Dutch study of 1233 men aged 40–79 y,²⁵ 13% reported having difficulties getting an erection. Prevalence increased with age from 6, 9, 22 and 38% in men aged 40–49 y, 50–59, 60–69 and 70–79 y, respectively. However, using the Sexual Function Inventory²⁶ to assess the prevalence, rates successively increased from 3 to 12, 33 and 64% in the respective age groups. While all men with ED in the group aged 40–49 y considered this a problem, only 16% of men aged 70–79 y considered their ED as bothersome. Men with ED also reported a significantly lower quality of life than comparators without ED.

In another regional Dutch study of 1960 men aged 50–78 y,²⁷ the prevalence of severe ED was 3% in men 50 to 54 y old and 26% in men 70–78 y. Any degree of erectile disability was reported by 22 and 55% of the two respective age groups. Of men with mild ED, 8% considered this to be a problem for them, compared with 38% of men with moderate-to-severe ED. The percentage of men with moderate-to-severe ED who considered their condition a problem, remained relatively constant in men aged 50–69, but diminished to 21% of men in the oldest age group.

In France,²⁸ 11% of 1037 men aged 18–70 y responded by a self-administered questionnaire that they suffered from ED in at least 50% of sexual encounters, while an additional 28% indicated that they had erectile difficulties at least occasionally (Table 1). Prevalence was relatively constant up to 40 y, however, it increased markedly thereafter with a prevalence of 67% for any degree of ED in the oldest cohort.

Béjin¹⁷ in a nationally representative study that used telephone interviews in a large French sample aged 18–69 y, reported an overall ED prevalence of 47%. Of the men, 7% indicated having frequent erection difficulties, 12% sometimes, and an additional 28% experienced erection difficulties only occasionally. Again, this study demonstrates a strong correlation of ED and age, with 73% of men aged 18–19 y indicating that they never experienced any ED, whereas this prevalence is 62% in men aged 25–34 y, 44% in men aged 45–54 y, and 34% in men aged 55–69 y.

In recent Spanish population-based study,²⁹ 1857 men aged 25–70 y were interviewed and responded to a self-administered questionnaire. The prevalence of ED was assessed in two ways, with a single question on whether the respondent had any erectile disability, and with the International Index of Erectile Function (IIEF).¹⁵ With the single question, the overall prevalence of any degree of ED was 12%, with 5% reporting minimal ED, 5% moderate ED, and 2% severe/complete ED. Prevalence by IIEF definitions was 19, 16, 2 and 0.6%, respectively (Table 1). Prevalence of any ED rose from 8% in men aged 25–39 y to 48% in men 60 to 70-y old, while the prevalence of moderate/severe ED was 4 and 32%, respectively.

North America

The Massachusetts Male Aging Study (MMAS)¹⁴ was a regional survey of 1709 men aged 40–69 y. Of the 1290 men who completed a paper questionnaire, 52% reported ED (Table 1), with 10% having complete, 25% moderate and 17% minimal ED. The probability of complete ED at age 70 was three-fold that at age 40, the probability of moderate ED

was two-fold, while that of minimal ED remained constant across all age groups. While the MMAS is representative of the population in Massachusetts, it is limited in terms of sociocultural diversity (96% of the study population was white). In a long-term follow-up investigation of this study,¹⁹ the crude incidence rate for ED was 26/1000 man years; increasing with age from 12/1000 to 30/1000 and 46/1000 for men aged 40–49, 50–59 and 60–69 y, respectively.

In another US county-based study with 2115 respondents, those aged 40–79 y were asked about their ability to have erections when sexually stimulated. ED was defined as having erections little or none of the time when stimulated. While in the youngest cohort, only 1% had such severe ED, this increased to 25% for the oldest age group. Overall, the prevalence of ED was 11.6% (Table 1).³⁰

In a reasonably nationally representative US study focussing on a relatively younger population (18–59 y of age), one dichotomous question on trouble maintaining or achieving an erection was asked in a face-to-face interview. Since participants were requested to mention the presence of a critical symptom or problem during the past 12 months, it may be assumed that the question elicited the range of moderate-to-severe ED. An overall prevalence of ED of 10% (of 1244 respondents) was reported (Table 1).³¹ Prevalence was 7% in the 18 to 29-y age group and was 18% in those 50 to 59-y old. This study assessed the impact of ED on quality of life, and found a significant correlation of ED with low sexual satisfaction and low general happiness.

Australia

In a relatively small-scale study³² representative for South Australia, male participants over 40 y of age were invited to respond to a mailed questionnaire. Of the 392 respondents (53% of target), 22% indicated difficulty in obtaining an erection, 23% indicated erections less than half the time when wanted, and 26% erections inadequate for intercourse (Table 1). There was a significant correlation with age, 7% of the 40 to 49-y-old group, 36% of the 60 to 69-y-old group and 92% of the 80-y-old group and over reported erection difficulties.

Other regions

In a Turkish interview, investigation of a randomly stratified sample ($n=1982$) of men aged >40 y, a preliminary report has shown that the overall age-adjusted prevalence of ED occurring usually or always was 36%. Also here, a pronounced effect of age was found. Thus, among 40 to 45-y olds, the

prevalence of moderate and severe ED was 8% but at age 70+ it was as high as 90%.³³

Besides these investigations, we have not been able to locate truly epidemiological data on the prevalence of ED. Thus, there is a deplorable lack of such data from the majority of the global population.

Summary

This review indicates that commonly age, and in particular relatively high age, has a major impact on the prevalence of ED although the overall prevalence of moderate-to-severe ED is profoundly different from a low of about 5% (Northern Europe) to a high of 35% (Massachusetts). These differences may be partly explained by different thresholds of definitions of moderate-to-severe ED. Another explanation is the different age distribution. Differences may be further explained by the technique chosen (phrasings of questions, choice of interviews or questionnaires, and perhaps whether or not the investigation is biased by being filled in at home or performed under controlled circumstances).

Factors affecting the prevalence of ED

A large number of factors have a negative impact on the erectile ability. A number of them were surveilled by Lewis *et al*.¹ Most prominent ones are medical conditions such as vascular diseases, neurological deficits, mood, iatrogenic factors and endocrinological conditions. Besides, other parameters including perceived health, social status and other diagnosed conditions can result in ED. For some of these conditions, the causal aspects on ED are widely accepted: however, it is not well understood which impact they have on prevalence. Despite the scarcity of data and the fact that there are no real epidemiological studies on patients with important comorbidities, the sections below aim to shed some light on the prevalence of ED in such patients.

Vascular conditions

Cardiovascular diseases including coronary heart disease, myocardial infarction, hypertension, hyperlipidaemia and peripheral vascular disease have a close correlation with ED. In prospective study,³⁴ it has been suggested that ischaemic heart disease and ED share important risk factors (smoking, obesity, hypertension and dietary factors). In agreement with these findings, Blanker *et al*²⁷ found that smoking, obesity and treatment for cardiovascular problems

were among significant risk factors. Complete impotence has been reported to be as common as 39% in those with treated heart disease;¹⁴ this was four-fold the prevalence in the overall study population. In Germany,²³ prevalence of ED in hypertensives was 36% as compared to 19% in the overall population, and 16% in normotensives. ED prevalence was even higher in patients with heart failure (58%) (Braun, personal communication). Finally, the Finnish study also²¹ reported a two-fold increase in ED in hypertensive men.

From clinical samples, high ED prevalence rates have been reported in men who had sustained a myocardial infarction,^{35,36} and in men over 60 y who have experienced heart attacks.³⁷

In a report by Wei *et al*,³⁸ there was a significant correlation between high concentrations of serum total cholesterol and ED. In the MMAS, total cholesterol was not correlated with ED but high-density lipoprotein cholesterol was inversely correlated with the prevalence of ED.¹⁴ The association between hyperlipidaemia and ED has been repeatedly described³⁹ but some reports suggest that increased ED is associated with the use of hypolipidaemic drugs rather than hyperlipidaemia or atherosclerosis *per se*.⁴⁰ Clearly, more work is needed to clarify the role of lipid levels in ED.

Diabetes mellitus appears to be a manifest risk factor for ED. In Massachusetts, the age-adjusted prevalence of complete impotence was 28% in treated diabetics against 10% in the total study population.¹⁴ In Spain,²⁹ a four-fold greater likelihood of ED emerged for men with diabetes compared with nondiabetic men. Moreover, 60% of Germans with diabetes as compared to 19% in the study population had ED²³ (Braun, personal communication).

Weinhardt and Carey,⁴¹ based on a literature review of controlled studies, found an about four-fold higher prevalence of ED in diabetic men than in controls.

In a large cross-sectional study⁴² of 10 000 Italian diabetic men, 36% reported ED. The prevalence increased from 5% in men aged 20–29 y to 46% in those aged 60–69 y. In men with ED, 30% reported complete and 70% incomplete erectile disability. Prevalence increased with the duration of diabetes as well as with insufficient metabolic control. ED appeared particularly prevalent in patients with retinopathy, neuropathy or nephropathy.

Neurological conditions

We have not been able to locate truly epidemiologically based reports on the impact of neurological disease and injuries on erectile ability. On the other hand, there is a body of reasonably convincing data based on clinical series, indicating that ED is a

common companion to many neurological conditions. The literature on this subject has recently been surveyed by a task force on neurosexology.⁴³

Brain damage is frequently followed by ED, and about 50–65% of men who have sustained a manifest stroke have been found to have moderate-to-severe ED.⁴⁴ The prevalence of ED in long-term survivors of traumatic brain injury is in some studies less than 10%, others have found a prevalence of ED from 40 to 70%.^{44,45} It should be remembered, however, that traumatic brain injury is most common in people younger than 30 y. Parkinson's disease has also been described as being accompanied by ED in about 50% of cases.⁴³ In a review of 24 studies, Lundberg *et al*⁴⁶ reported that a median of 80% among more than 2500 men with spinal cord injuries could achieve erections without therapeutic assistance, with a much higher prevalence of ED in those with complete lower sacral injuries (about 75%) than in those with complete upper or incomplete cord lesions (<10%). Other conditions that are often associated with ED are hypothalamo-pituitary disorders (in particular, pituitary adenoma), epilepsy (especially frontal lobe engagement), multiple sclerosis and different disorders of the spinal cord and peripheral nerves.

Mood and depression

Several studies have shown that there is an association between depression and male ED. ED has been observed to increase with the severity of depression. At the maximum degree of depression, the age-adjusted probability of moderate-to-severe impotence was nearly 90%, as compared with 59% for medium-grade depression and 25% for mildly depressed men in the Massachusetts study.¹⁴

Using data from the same study, Araujo *et al*⁴⁷ further investigated the association between ED and depression. The prevalence of depressive symptoms was constant across the age range in this cohort, averaging some 12%. After adjustment of potential confounders including age, depression was associated with a nearly two-fold increased likelihood for ED than in nondepressed controls. The use of antidepressant medications, which may also increase the prevalence of ED,⁴⁸ did not affect the odds ratio.⁴⁷

Iatrogenic ED

Besides the illnesses associated with ED, there are a number of medical interventions and treatments that impact on the sexual abilities. ED secondary to prostatectomy for cancer is probably one of the most common problems; however, no epidemiological

studies assessing the prevalence of ED in these men could be found. In clinical series, rates of ED show high variability and depend on the method of intervention. Stanford *et al*⁴⁹ investigated the outcomes of radical prostatectomy in 1291 men aged 39–79 y. Among men who had no ED before surgery, the proportion of men reporting impotence at follow-up was 66% for non-nerve-sparing surgery, 59% for unilateral surgery, and 56% for bilateral nerve-sparing surgery. Catalona *et al*⁵⁰ assessed ED in 858 men in a consecutive series at one clinic: erections returned in 68% of men with bilateral nerve-sparing surgery as compared to 47% in men with unilateral nerve-sparing surgery. A study in men treated for prostate cancer⁵¹ assessed that 69% of men had erectile function sufficient for intercourse before treatment. Only 10% of men who underwent radical prostatectomy and 15% of men with beam radiation therapy regained erectile function. According to recent studies, surgery for benign prostatic hyperplasia results in less ED than cancer surgery, leaving sexual function almost stable for most patients^{52,53} and modern minimally invasive procedures appear associated with even less adverse effects.^{54,55}

It has been repeatedly reported that around 25% of erectile disabilities seen in medical practice are drug-induced.^{56,57} In the MMAS, diuretics and benzodiazepines were strongly associated with an increased prevalence of ED that persisted after correction for confounding factors.⁵⁸ ED affected 10–20% of men taking thiazide diuretics, and to a lesser extent patients who are on betablockers. Antihypertensive drugs are particularly often reported to cause ED. This is the case for betablockers, Ca-channel blockers (CCBs), ACE inhibitors and angiotension-2 antagonists. Most likely, the lowered blood pressure is the cause; hence, the risk of causing ED by prescribing an antihypertensive is proportional to its effect. Fibrates and statins for lowering blood lipids have also been reported to cause ED. Very little data are available that help to estimate the prevalence of ED in those patient groups.

ED is a commonly reported side effect of histamine-receptor antagonists for treatment of gastric ulcers. Moreover, some of the NSAID drugs have been reported to cause ED. These drugs are prostaglandin inhibitors and may thus be anti-erectogenic. Drugs that depress or sedate the central nervous system (eg, tranquillisers, opiates, oestrogen and antidepressants) may be associated with ED.⁵⁹

Endocrinological conditions

In a survey of the literature, Kim *et al*⁶⁰ reached the suggestion that psychogenic (erotogenic) erec-

tions as opposed to spontaneous (ie nocturnal) erections are only partly androgen-dependent. On the other hand, to an unknown extent, the fact that relative male hypogonadism increases with increasing age may be one background for the increased prevalence of ED and perhaps more clearly of decreased level of sexual desire in older men. This may partially explain the age-dependent lower level of problems and dissatisfaction because of erectile disabilities. Recently, however, Rhoden *et al*⁶¹ in men aged 40–90 y regardless of age found no significant differences in total serum testosterone level between those with different degrees of ED and those with or without ED.

Summary

A number of physical and psychological conditions are widely described to be associated with greatly increased prevalence of ED. So far, it remains difficult to estimate the prevalence rates in most such patient groups since very little epidemiological data are available.

Consultation rates for men with ED

When considering the impact of ED on the health-care system, the accurate assessment of the prevalence is only the starting point. A man who reports ED firstly registers a lack of erectile activity. Secondly, the distress this physical dysfunction causes him must be considered. This can be characterised as an aspiration-achievement gap.¹⁶ As pointed out in the DSM-IV,⁶² distress caused by ED is clinically more important than ED *per se*. While having ED and feeling that this causes distress is prerequisite for a man to consider seeking treatment for ED, there are other additional important determinants for actually requesting an appointment. These can include having a partner who is interested in sexual activity and who does not suffer herself from sexual disabilities. This is a very relevant parameter, since female sexual dysfunctions themselves have a prevalence rate in the range of 40–50%,^{7,31,20} and ED is to a significant extent accompanied by female partners having one or more sexual dysfunctions.⁶³

Moreover, ED is often accompanied by other male sexual dysfunctions, including low desire and ejaculation problems. Other factors must be recognised as having an impact on the men's willingness to seek treatment for ED, including the fact that few people manage to openly discuss ED, because the majority consider it a taboo.⁶⁴

Only a relatively small percentage of men with ED consider seeking counselling or treatment. In Fin-

land,²¹ one-third of men with ED had consulted a physician. In Sweden,⁷ approximately one-third of men with ED sought advice⁶ but only few of them consulted a medical expert.⁷ Generally, it appears that about 30% of men with ED have sought treatment,^{5,65} but still fewer actually receive treatment.^{66,67}

It has been assumed that the availability of convenient treatments has an impact on the diagnosis and treatment rates for ED. Skaer *et al*⁶⁸ reviewed data from the US National Ambulatory Medical Care Survey for the years 1990–1998 and found a significant increase in the rate of physician–patient encounters for ‘a complaint (of ED) as a reason for requesting an appointment’ and/or ‘a diagnosis of ED’. In 1990, there were 17 encounters for a complaint of ED and 15 diagnoses of ED/1000 US male population. While the number of visits was relatively stable between 1990 and 1995, a significant increase occurred in 1996 to 25 encounters/1000 men for a complaint and 28/1000 for a diagnosis of ED. This rate stayed at this level until the end of 1998. The introduction in 1998 of PDE-5 inhibitor treatment did not immediately appear to influence the established upward trend in the number of encounters. A look at the prescribing of sildenafil in the same survey, however, showed that only in 41% of patients prescribed sildenafil was a diagnosis of ED recorded, and only in 33% was a complaint of ED given as a reason for the appointment. This highlights that there may be an under-reporting of ED in the physician files.

Conclusions

Large variations in the prevalence of ED have been observed in a number of studies. To some extent, differences probably reflect variations in definitions, methodology and study populations. The MMAS is often cited pertaining to ED prevalence. However, the Massachusetts 35% prevalence of moderate-to-severe ED is considerably higher than the 5–20% reported by most others. Information on prevalence rates in higher risk subgroups of the population is rather scarce. More epidemiological work is required to generate solid assumptions on prevalence rates in such subgroups of the population.

Only when the ED results in distress, can it be considered a clinically relevant condition. It has been shown in a number of studies that a subset of 30–70% of men with ED suffer distress from having ED. Thus, it appears that the prevalence of ED requiring clinical attention is in the range of 3–7%, and is therefore about 10-fold less than what has been communicated in several publications on ED. For several reasons, treatment rates of ED are clearly lower than the prevalence rates. These estimates should send a positive message to health-care

payors that are currently excluding reimbursement of a medically relevant condition.

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