ERECTILE AND EJACULATORY DYSFUNCTION IN A COMMUNITY-BASED SAMPLE OF MEN 50 TO 78 YEARS OLD: PREVALENCE, CONCERN, AND RELATION TO SEXUAL ACTIVITY

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ABSTRACT

Objectives. To determine the prevalence rates of erectile and ejaculatory dysfunction, associated bother, and their relation to sexual activity in a population-based sample of elderly men.

Methods. Data were collected from 1688 men by way of self-administered questionnaires (including the International Continence Society male sex questionnaire) and measurements at a health center and urology outpatient department.

Results. The prevalence of significant erectile dysfunction (ie, erections of severely reduced rigidity or no erections) increased from 3% in men 50 to 54 years old to 26% in men 70 to 78 years old. In the same age strata, the prevalence of significant ejaculatory dysfunction (ie, ejaculations with significantly reduced volume or no ejaculations) increased from 3% to 35%. Pain or discomfort during ejaculation was rare (1%) and independent of age. In general, men were more concerned about erectile dysfunction than about ejaculatory dysfunction. However, most men had no or only little concern about their dysfunction. The percentage of men who reported being sexually active declined with increasing age and was lower in men with erectile and ejaculatory dysfunction and in men without a partner. In sexually active men, 17% to 28% had no normal erections, indicating that with advancing age normal erections are not an absolute prerequisite for a sexually active life.

Conclusions. Erectile and ejaculatory dysfunction are common in elderly men. The results of this study indicate that these conditions are much less of a problem for older men than previously suggested.

The introduction of new classes of drugs and new modes of administration for existing drugs have increased the public demand for the treatment of erectile dysfunction (ED).1 Despite this, there are a paucity of detailed community-based data on ED and its impact on quality of life. Surveys conducted in the United States,2–4 Japan,5 and Europe6 all show a high prevalence of ED and a clear increase of the problem with advancing age. The variation in the reported prevalence rates among these studies may be partly explained by differences in the definition of ED.

Ejaculatory dysfunction (EjD) has been studied only in a small group of community-based men in England.7 A French survey investigated “ejaculatory difficulty,”8 but it is unclear how the investigators defined this concept. Thus, the epidemiologic database on EjD is very limited. Furthermore, it is unclear to what extent men are concerned about ED and EjD and to what extent ED is associated with the cessation of sexual activity.

We studied these aspects as part of a large, ongoing longitudinal study conducted in The Netherlands.9 The purpose of the present study was to determine (a) the prevalence of ED and EjD and associated bother and (B) the proportion of men who are sexually active and the relation to ED.
The ICS sex questionnaire covers four items, each with the International Continence Society (ICS) sex questions that included the International Prostate Symptom Score\textsuperscript{10} and selected by way of a self-administered\textsuperscript{11} 13-item questionnaire that had passed since sexual activity ceased in men no longer sexually active

<table>
<thead>
<tr>
<th>Age strata\textsuperscript{4} (yr)</th>
<th>Sexually Active Men\textsuperscript{*}</th>
<th>Median Time Since Sexual Activity Ceased in Men not Sexually Active\textsuperscript{5} (yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50–54 (334)</td>
<td>96.4 (93.8–98.1)</td>
<td>2 (1–8)</td>
</tr>
<tr>
<td>55–59 (409)</td>
<td>96.3 (94.0–97.9)</td>
<td>2 (0–4)</td>
</tr>
<tr>
<td>60–64 (389)</td>
<td>87.4 (83.7–90.5)</td>
<td>3 (1–6)</td>
</tr>
<tr>
<td>65–69 (302)</td>
<td>79.1 (74.1–83.7)</td>
<td>4 (2–10)</td>
</tr>
<tr>
<td>70–78 (171)</td>
<td>69.0 (61.5–75.8)</td>
<td>6 (3–10)</td>
</tr>
<tr>
<td>Total population (1605)</td>
<td>88.0 (86.3–89.6)</td>
<td>4 (2–10)</td>
</tr>
</tbody>
</table>

\textit{p} value <0.001\textsuperscript{6} <0.001\textsuperscript{7}

\textsuperscript{a} Numbers in parentheses are the 95\% confidence intervals.
\textsuperscript{b} Numbers in parentheses are the interquartile range.
\textsuperscript{c} Numbers in parentheses are the numbers of patients in each age group.
\textsuperscript{d} Chi-square test for trend.
\textsuperscript{e} Spearman's correlation coefficient for age vs. years since sexual activity ceased (\textit{r} = 0.27).

MATERIAL AND METHODS

The data presented were collected as part of a large, ongoing community-based study, the Krimpen study on male urogenital tract problems and general health status, described in detail elsewhere.\textsuperscript{5} In brief, the Krimpen study investigated all men,\textsuperscript{5} 50 to 75 years old (\textit{n} = 3924), in a Dutch municipality near Rotterdam to gain information on male urogenital tract dysfunction. Men without radical prostatectomy, prostate or bladder cancer, neurogenic bladder disease, or negative advice from their general practitioner and who were able to complete the questionnaires and visit the health center were eligible and were invited to participate in the study. Recruitment took place between August 1995 and January 1998. During this period, 152 men had become older than 75 years, but were nevertheless enrolled. All men entering the study provided written informed consent.

The study consisted of two phases. In the first phase, the data of 1688 responders (50\% of all eligible men) were collected by way of a self-administered 113-item questionnaire that included the International Prostate Symptom Score\textsuperscript{5} and the International Continence Society (ICS) sex questionnaire.\textsuperscript{7} The ICS sex questionnaire covers four items, each with a bother score ranging from no problem to a serious problem on a four-point scale. In addition, the men were asked whether they were sexually active and, if not, how long ago their sexual activities ceased (see Appendix). The questionnaire also included a question on marital status. All men visited the local health center for height, body weight, and blood pressure measurement and urinalysis.

In the second phase, 1661 men (98.4\% of the participants) visited a urology outpatient clinic for the following tests: serum prostate-specific antigen, digital rectal examination, transrectal ultrasound of the prostate, uroflowmetry, and postvoid residual urine volume. Prostate biopsies were taken according to a protocol described in detail previously.

The determinants of ED and EjD will be analyzed and reported separately.

On the basis of the answers to the questions in the ICS sex questionnaire, the following definitions were made. Minor ED was defined as a report of erections with “reduced rigidity”; significant ED was defined as a report of erections with “severely reduced rigidity” or “no erections.” Minor EjD refers to a report of ejaculations of “reduced quantity”; significant EjD refers to ejaculations of “significantly reduced quantity” or “no ejaculations.” On the basis of this definition, we created mutually exclusive categories of sexual dysfunction: “no significant ED or EjD,” “significant ED only,” “significant EjD only,” and “both significant ED and EjD.”

A major concern about one of the topics on the ICS sex questionnaire was defined as a report of “quite a problem” or “a serious problem” on the associated questions.

STATISTICAL ANALYSIS

A batch of 27 completed questionnaires was lost before the data were entered in the database. Men with newly diagnosed prostate cancer (\textit{n} = 57, including 1 man with a lost questionnaire) were excluded from all analyses. The data of 1605 men constitute the basis for this report.

Men were categorized into 5-year age strata. Fifty-three men were 75 to 78 years old and were included in the 70 to 78-year age stratum to form the 70 to 78-year age stratum. The prevalence of the sexual symptoms and associated concern from the ICS sex questionnaire was calculated for each of the 5-year age strata.

Spearman’s correlation coefficient was used to characterize the relation between the quality of erections and the quantity of ejaculations and the relation between age and years that had passed since sexual activity ceased. To test the relationship between two variables that could be expressed in discrete categories, the chi-square test was used. If necessary, trend versions were used. Ninety-five percent confidence intervals (95\% CI) were calculated for all percentages on the basis of the binomial distribution. A \textit{p} value of 0.05 was considered significant.

RESULTS

In the total study population, 93.4\% of the men were married or living together.

SEXUAL ACTIVITY

Table I gives the percentage of sexually active men. For those who were no longer sexually active, Table 1 indicates the number of years that passed

TABLE I. Percentage of sexually active men and number of years that had passed since sexual activity ceased in men no longer sexually active
since sexual activity had ceased. The percentage of sexually active men decreased strongly with advancing age (chi-square test for trend $P < 0.001$). The percentage of sexually active men was lower in men without a partner: for all ages, 72.5% (95% CI 62.2% to 81.4%) compared with 89.0% (95% CI 87.3% to 90.5%) for men with a partner (chi-square test $P < 0.001$).

Table II shows the relation between significant ED and EjD and sexual activity. Of the men with minor ED or minor EjD, 88% (95% CI 84% to 91%) and 89% (95% CI 86% to 92%), respectively, were sexually active.

**ERECTILE DYSFUNCTION**

Figure 1 shows the decrease in erectile function with age and that a complete absence of erections was rare before 65 years of age (1%; 95% CI 1% to 2%). In men 50 to 64 years old, 5% (95% CI 4% to 7%) claimed to have erections with severely reduced rigidity. The prevalence of minor ED was relatively high across all age strata.
**Ejaculatory Dysfunction**

Figure 1 also shows the decrease in ejaculatory function with age. A complete absence of ejaculations was rare before 65 years of age (4%; 95% CI 3% to 6%). Another 4% (95% CI 3% to 5%) in this age group reported significantly reduced quantity. In men 65 years old and older, these percentages were 16% (95% CI 13% to 20%) and 10% (95% CI 7% to 13%).

The quality of erections and quantity of ejaculatory volume were positively related: ie, men with a decreased quality of erection had a decreased quantity of ejaculatory volume ($r = 0.53$, $P < 0.001$).

**Pain or Discomfort During Ejaculation**

In this study population, pain or discomfort during ejaculation was rare. Of all men having ejaculations, regardless of the quantity of the ejaculatory volume, only 1% (95% CI 0% to 1%) experienced moderate to severe pain or discomfort, and 95% (95% CI 94% to 96%) experienced no pain or discomfort at all. No differences were found between the age groups. Pain or discomfort during ejaculation occurred more often in men with a significantly reduced quantity of ejaculation than in men with normal ejaculatory volumes: 19% (95% CI 12% to 29%) and 2% (95% CI 2% to 4%), respectively (chi-square test, $P < 0.001$).

**Concern**

Eight percent (95% CI 5% to 11%) and 3% (95% CI 2% to 5%), respectively, of men with minor ED or minor EjD had major concerns about their dysfunction. In this respect, no differences were found among the age groups (both chi-square test for trend, $P > 0.2$) or between men with and without partner (both chi-square test, $P > 0.2$). Table II gives the prevalence of concern about significant ED and EjD. Men were more concerned about ED than about EjD; concern about EjD was higher in men who also reported ED. Until 70 years of age, no age-dependent differences were found. Men older than 70 years had much less concern about significant ED and EjD (20% [95% CI 10% to 35%] and 7% [95% CI 2% to 16%], respectively) than younger men. No significant differences were evident between men with and without a partner.

About two thirds of men with moderate or severe pain or discomfort during ejaculation had concerns about this and about 12% (95% CI 5% to 24%) of men with slight pain did.

**COMMENT**

The results of this community-based survey indicate that ED and EjD are common in men 50 to 78 years old. However, most men have a low level of concern about their dysfunction.

The response rate of 50% in this study was remarkably high, considering the effort required from the participants and the number of invasive tests performed. Previous population-based studies on this subject achieved similar or lower response rates. Higher rates were achieved only in questionnaire-based studies in which no invasive tests were performed. Furthermore, a nonresponse study showed that the participants were comparable to nonresponders for age, educational, and marital status and for smoking and drinking habits; participants had more voiding symptoms and a slightly lower level of general well-being. Moreover, we consider that the level of sexual function described in the current report is a good representation of the total population of men 50 to 78 years old in The Netherlands, as the main subject of the study was not sexual function.

The comparison of our study with others is hampered because different questions, response options, and definitions were used and studies were performed in different cultures. Especially because of the cultural differences, it is unlikely that one study in one country will establish epidemiologic baseline data that are valid throughout the world.

**Erectile Dysfunction**

Between 50 and 78 years of age, the prevalence of significant ED increased considerably, from 3% in men 50 to 54 years old up to 26% in men 70 to 78 years old. However, a complete inability to achieve an erection was relatively rare in men 50 to 65 years of age (only 1%). Our results suggest that minor ED is quite common (in about one quarter of the study population).

The prevalence rates found in our study were comparable with the findings in the Olmsted County study. In the latter study, fewer than 1% of men 40 to 49 years old had “complete ED” compared with more than one quarter of men 70 to 79 years old. Our results and those from the Olmsted County study have markedly lower prevalence rates than those reported in the Massachusetts Male Aging Study. In the latter survey, 35% of men 40 to 70 years old had “moderate to complete impotence.” They performed a calibration study to determine “impotence.” The responses of the Massachusetts Male Aging Study subjects to imprecise questions about erectile function were retrospectively transformed into more precise response categories. For this purpose, the results from the urology clinic patients were used. These men had received the same questionnaire as the Massachusetts Male Aging Study subjects and additionally were asked to characterize themselves as “not,” “minimally,” “moderately,” or “completely” impo-
tent. In this respect, no clear definition of “impotence” was used. The use of clinic patients for this calibration may have substantially increased the prevalence of “impotence.” Other surveys on ED also reported different results from the present study. This may be due to the different definitions used, varying from “erection difficulty” to “erections seldom sufficient for intercourse.”

**Ejaculatory Dysfunction**

A reduction in ejaculatory volume was prevalent in our study population, closely associated with the quality of erections. Pain or discomfort during ejaculation was so uncommon in men 50 to 78 years old that this symptom probably represents an underlying disorder.

Information on ejaculatory function in published reports is scarce. In agreement with our results, a study in Great Britain (also using the ICS sex questionnaire) showed an association between reduced ejaculation and age. In a community-based sample of 423 men, they also reported an absence of an association between age and pain or discomfort. “Ejaculatory difficulty” was studied in a French community-based sample of 1568 men; 3% of those 50 to 59 years old reported “ejaculatory difficulty each time.” This prevalence doubled in the subsequent age decades, reaching 12% in men 70 to 79 years old. It is unclear whether this figure included decreased volume and pain or discomfort, because a clear definition of “ejaculatory difficulty” was not given.

**Concern**

Most men in our study had no concern about their ED or EjD. The level of concern in men with significant ED or EjD was four to fivefold higher than in men with minor dysfunction. This justifies the use of these definitions. Still, only one third of the men with significant ED and only 13% of those with significant EjD regarded their dysfunction as more than a bit of a problem. In contrast, most men with pain or discomfort during ejaculation were concerned about it.

Until 70 years of age, no age-dependent differences in the level of concern were found. The percentage of men older than 70 years with concerns about ED was roughly only half that of younger men.

The results of a Japanese survey are in line with our results, showing “little worry and concern about sexual functioning” in 80% of men 40 to 79 years old. In contrast to our study, the Olmsted County study yielded the counterintuitive result that older men 70 to 79 years old were more worried about sexual function than younger men 40 to 49 years old.

No information was obtained on the impact of the sexual dysfunction on the partners. Future studies on sexual dysfunction should include this topic.

**Sexual Activity**

Our results suggest that sexual activity decreases with advancing age and with the presence of ED and EjD. Sexual activity was not restricted to intercourse. In sexually active men, 50 to 70 years old, 17% to 28% did not have normal erections, indicating that with advancing age normal erections are not an absolute prerequisite for men to consider themselves sexually active. Sexual satisfaction was not a topic in this study.

In men who were no longer sexually active, the median number of years that had passed since sexual activity ceased increased from 2 to 6 in the youngest and oldest age stratum, respectively. This relatively low increase might be explained by the fact that the number of men not sexually active cumulates after 60 years of age. Older men in the sexually inactive group had stopped sexual activity relatively recently. Moreover, the state of sexual activity may alter within individuals over time. Men who had stopped sexual activities may resume taking part in these after a certain period, for example in a new relationship. Furthermore, this low increase might indicate that men who had stopped sexual activity tended to die before they reached the next 5-year age stratum. Smith and colleagues described a protective effect of sexual activity on men’s health, supporting the latter explanation. Data from the longitudinal part of the Krimpen study may be of help in demystifying these findings.

**Conclusions**

The results of this study show that minor degrees of ED and EjD are common in Dutch men 50 to 78 years old. Significant ED and EjD are less common. However, the level of associated concern is rather low; this may indicate that most men consider this part of the aging process. Men have more concern about ED than about EjD. Pain or discomfort during ejaculation is a rare but concern-provoking problem in these men.

Additional studies are needed to determine how these figures relate to doctors’ consultations. Data on sexual functioning and associated concern using the same questions and definitions are needed from population-based studies in other countries to determine whether these results are able to be generalized on an international level.

**References**


APPENDIX

ICS SEX QUESTIONNAIRE
To what extent do you feel that your sex life has been spoilt by your urinary symptoms?
How much of a problem is that for you?
Do you get erections?
How much of a problem is that for you?
Do you have an ejaculation of semen?
How much of a problem is that for you?
Do you have pain or discomfort during ejaculation?
How much of a problem is that for you?
If you have no sex life, how long ago did this stop?