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Lower urinary tract symptoms and erectile dysfunction are highly prevalent in ageing men

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OBJECTIVE

To evaluate a possible correlation between the International Prostate Symptom Score (IPSS) and the Sexual Health Inventory for Men (SHIM) in an unselected population of men presenting to a clinic, as lower urinary tract symptoms (LUTS) and erectile dysfunction (ED) are highly prevalent in ageing men, and recent largely community-based epidemiological studies reported a close association between ED and LUTS.

PATIENTS AND METHODS

This was a cross-sectional study in an unselected consecutive sample of 118 men aged >40 years attending a urology clinic; the reason for consulting was not ascertained. While in the waiting room the men were asked to participate in the study and on agreement were given the IPSS and the SHIM to complete.

RESULTS

The mean (range) age of the participants was 61.7 (45–82) years. Overall, 19 (16%) and 47 (40%) of the men reported having moderate or severe LUTS, respectively. Erectile problems were also common, the prevalence of moderate ED was 11% and complete ED 29%. The Pearson correlation coefficient

between the IPSS and the SHIM was -0.32 ($P < 0.001$).

CONCLUSION

There was a close correlation between the IPSS and SHIM in this unselected population of men, adding evidence favouring a close association between LUTS and ED.

KEYWORDS

lower urinary tract symptoms, erectile dysfunction, International Prostate Symptom Score, Sexual Health Inventory for Men.

INTRODUCTION

Recent epidemiological studies showed a significant association between erectile dysfunction (ED) and presence of LUTS. Morillo *et al.* [1] reported LUTS as a risk factor for ED, with an age-adjusted odds ratio of 1.5. Braun *et al.* [2] surveyed a cohort of German men aged 30–80 years; in all 4489 men in Cologne, Germany, completed an evaluation questionnaire. ED was present in 19.2% of subjects, its prevalence increasing markedly with age. The total prevalence of LUTS was 72.2% in subjects with ED, compared with 37.7% in subjects without ED. The age-adjusted odds ratio for finding ED in association with LUTS was 2.11 ($P < 0.001$).

Nicolosi *et al.* [3] assessed the prevalence and comorbidities of ED in community-based populations in Brazil, Italy, Japan and Malaysia. In each country, random samples of ≈ 600 men aged 40–70 years were interviewed using a standardized questionnaire. In all 2417 men responded to the ED question and were included in the analysis. Multivariate analysis showed that LUTS were associated with ED in a graded fashion. Whereas similar proportions of subjects with (77%) and with no ED (88%) reported having no LUTS or only minor LUTS, moderate and severe LUTS were markedly more common in those men with ED than in those without [3].

Historically, various indices of ED have been used; thus the objective of the present study was to evaluate a possible correlation between the IPSS and the Sexual Health Inventory for Men (SHIM) in an unselected cohort of men.

PATIENTS AND METHODS

A cross-sectional study was conducted in an unselected consecutive sample of 118 men aged >40 years attending a urology clinic; their reasons for presenting were not determined. While in the waiting room the men were asked if they were willing to participate in the study; if they agreed they received the IPSS and the SHIM to complete, both being self-administered. The IPSS was developed and validated to assess urinary symptoms arising from BPH and is used to grade the severity of prostate symptoms [4]. The IPSS is the most commonly used scoring system for assessing BPH symptoms. In general, a score of 0–7 indicates mild, 8–19 moderate and 20–35 severe symptoms. The IPSS recalls symptom severity over the past month and measures the patient's experience; it is available in various languages [4].

The SHIM, an abridged version of International Inventory of Erectile Function, is a widely used, multidimensional self-reported instrument for evaluating erectile function. It has high sensitivity in screening for ED [5], and is also available in many languages. Lower scores indicate poorer erectile function.

The data were analysed using standard methods and commercial software, with $P < 0.05$ considered to indicate statistical significance. The Pearson correlation

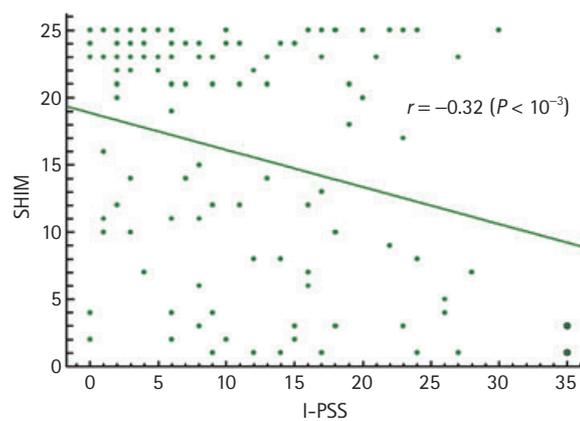


FIG. 1. Correlation of the IPSS and the SHIM individual scores among 118 men in Brazil.

coefficient was calculated to assess the relationship between the scores, and a linear regression model was fitted to adjust the relationship for age. We also categorized ED into complete/moderate or mild/none, and the IPSS into mild or moderate/severe symptoms, and then the κ statistic was estimated to evaluate the degree of agreement between the two dichotomous scores [6]. The κ statistic ranges from -1 to 1 , with 1 indicating perfect agreement, 0 indicating the agreement expected on the basis of chance alone, and $0-0.4$ a poor to fair agreement [7].

RESULTS

The mean (range) age of the 118 men was 61.7 (45–82) years. Overall, 19 (16%) and 47 (40%) of the men reported having moderate or severe symptoms of LUTS, respectively. Erectile problems were also common; the prevalence of moderate ED was 11% and complete ED 29%. The Pearson correlation coefficient between the IPSS and the SHIM was -0.32 ($P < 0.001$; Fig. 1). In the age-adjusted model, the IPSS remained significantly associated with the SHIM score (β coefficient -0.25 , 95% CI -0.544 to -0.091). The agreement as measured by the κ statistic was 0.237 (mild to moderate agreement).

DISCUSSION

LUTS and ED are highly prevalent in ageing men; many epidemiological studies have shown that ED is highly prevalent in men with LUTS, and that ED is strongly related to the severity of LUTS and to increasing age

[8–10,11]. The aim of the present study was to determine whether the severity of BPH, as measured by the IPSS, correlated with the severity of ED, as measured by the SHIM. In community dwelling men there was an apparent correlation beyond that expected by chance [3,8]. In the present study there was also a correlation between the IPSS and SHIM in the unselected population, adding evidence in favour of an association between LUTS and ED. In the present sample, worse voiding function was associated with worse erectile function.

The nature of this connection or precise association between these most common genitourinary diseases in men has yet to be defined. However, there are some animal models that may help to define the relationship. Chang *et al.* [12] created a surgical partial BOO in rabbits and found subsequent physiological and morphological changes in the corpus cavernosum. The smooth muscle of obstructed animals generated 40–50% more force than controls, and had more difficulty in relaxing. There was also an increase in the size of smooth muscle bundles in operated animals. More recently, Chang *et al.* [13] reported, in the same model, greater expression of both isoforms of Rho-kinase (α and β) in cellular extracts from corpora cavernosa isolated from obstructed animals than in sham-operated rabbits. These authors claimed that the RhoA/Rho-kinase pathway could be involved in the mechanism for LUTS associated with ED.

Both urinary and erectile function are markedly affected by changes in smooth muscle tone. When smooth muscle tone is increased in the prostate there is excessive growth of tissue mass (e.g. myofibroblasts of

periurethral and transition zones of the prostate) that physically compress the urethra, leading to urinary obstruction and BPH. In rats unilateral sympathectomy leads to volume increases of the prostatic homolateral lobe [14]. Furthermore, in experimental studies, transgenic rats that develop increased autonomic activity have prostatic hyperplasia at an earlier age than do animals that have no increased autonomic activity [15]. In addition, the increase in smooth muscle tone affects the contraction of the muscles of the prostate. Problems with achieving or maintaining an erection may be, in part, the result of increased smooth muscle tone that prevents relaxation of the smooth muscle.

Nitrgenic innervation of the prostate is lower in BPH than in normal tissue [16,17]. It logically follows that prostate tissue levels of nitric oxide and its synthase are reduced in BPH, which reduces prostatic smooth muscle relaxation and compromises voiding function, recognized in progressive BPH or LUTS. The reduction on nitrgenic innervation may lead to ED and could link these two diseases by one unifying concept.

Another possible consideration is that atherosclerosis is very common in ageing men, and thus pelvic hypoxia could lead to an over-expression of TGF β 1 and affect prostanoid production [18]. This would result in smooth muscle loss (replaced by collagen), fibrosis and loss of compliance, hyperactivity and impaired contraction. All these conditions are common to ED and BOO.

Despite evidence from the present study and others in favour of a close association between LUTS and ED, the exact nature of this relationship and its pathophysiology remain to be determined. Future studies are warranted to define the association more precisely.

CONFLICT OF INTEREST

None declared.

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Abbreviations: SHIM, Sexual Health Inventory for Men; ED, erectile dysfunction.