The Association between Erectile Function and Severity of Lower Urinary Tract Symptoms

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It is unclear whether the erectile dysfunction (ED) that frequently occurs with lower urinary tract symptoms (LUTS) may have a common causative factor: sympathetic overactivity. The aim of this study was to evaluate the association between ED and LUTS.

From June 1998 to March 2000, 75 male patients, presenting with LUTS, enrolled into the present study. A total of 63 patients were included into the study, age ranging from 51-74 years (mean 61.5). All patients completed an American Urological Association (AUA) symptom severity index and IIEF-5 questionnaires.

The results from the present study demonstrated that the AUA symptom and IIEF-5 scores do not correlate with increasing age. When the statistical analyses were performed for each age group, there were no significant differences in mean IIEF-5 values between any degree of AUA symptom score in the same age group ($p > 0.05$). The present results indicate that there is no association between the degree of LUTS and the erectile function.

Moreover, the statistical analyses of the association between any degree of erectile function and the mean AUA symptom score either for obstructive or irritative symptoms revealed no significant differences ($p > 0.05$). The present study demonstrates that there is no association between BPH and erectile function in any age group, inconsistent with the sympathetic overactivity theory.

Keywords: *Erectile function, Erectile dysfunction, ED, LUTS, Lower urinary tract symptoms, BPH*

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It is well recognized that the incidence of benign prostatic hyperplasia (BPH) and sexual dysfunction in men increase with age[1,2]. Sexual dysfunction commonly occurs in the same subset of patients who are afflicted by symptomatic BPH, and who require medical or surgical treatment. In spite of the well known adverse effects of pharmacological treatment for BPH on sexual function, recent studies reported an improvement in erectile function after alpha blockers taken for lower urinary tract symptoms (LUTS) caused by BPH [3,4]. Moreover, there is also evidence to suggest that successful medical treatment for erectile dysfunction (ED) appears to improve LUTS[5]. The aim of this study was to evaluate the association between ED and LUTS.

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Material and Method

Study design

Inclusion/Exclusion criteria

Male patients with LUTS who were over 50 years of age, were eligible for enrollment into the present study. Patients were excluded from the study if they had evidence of possible prostate cancer, stricture of urethra, urinary tract stone, previous prostate or bladder neck surgery and active urinary tract infection. In addition, patients were also excluded if they were under treatment for ED, or were taking alpha blocker or 5-alpha-reductase inhibitor within the past 3 months, or had no sexual activity in the last 4 weeks.

Assessment of LUTS

For assessment of LUTS, patients completed an American Urological Association (AUA) symptom severity index. The total score ranged from mild (1-7),

to moderate (8-19), and to severe (20-35)[6]. The symptom score was separately calculated as irritative and obstructive symptom scores.

Assessment of erectile function

For assessment of erectile function, patients completed an abridged, 5-item version of the International Index of Erectile Function (IIEF-5)[7]. The total score was classified into 5 groups depending on the severity of erectile function: none (22-25), mild (17-21), moderate (12-16), moderate to severe (8-11), and severe (1-7).

Statistical analyses

Descriptive statistics

Age, AUA symptom score and IIEF-5 score were summarized as mean $\pm$ standard deviation and median (range).

Statistical tests

For the IIEF-5 score: Two-way analysis of variance (2-way ANOVA) was used to test the null hypothesis that the mean IIEF-5 score was the same for all combinations of AUA symptom score and age groups. To increase the power of the test a multiple regression analysis with the AUA symptom score and age groups as continuous covariates was also performed.

For the AUA symptom score: One-way ANOVA was used to test the hypotheses that the mean age and the mean AUA symptom score (either obstructive or irritative) were the same for all IIEF-5 groups. To adjust for the confounding effect of age as a continuous covariate on the relationship between the mean value of the AUA symptom score and the IIEF-5 grouping, analysis of covariance (ANCOVA) was performed. To increase the power of the test a multiple regression analysis with age and the IIEF-5 score as continuous covariates was also performed.

All statistical analyses were performed with STATA version 7. Statistical significance was set at a p-value of 0.05 or less.

Results

From June 1998 to March 2000, 75 male patients, presenting with LUTS, were enrolled into the study. Twelve patients were excluded due to no sexual activity within the last 4 weeks. A total of 63 patients were included into the study, with ages ranging from 51-74 years (mean 61.5).

Age, IIEF 5 and AUA symptom scores

The correlation between the age and the AUA symptom score and the correlation between the age and IIEF-5 score are presented as scattergrams (Fig. 1, 2). The statistical analysis using Pearson correlation coefficient revealed little correlation between the age and the AUA symptom score (r = -0.128) and little correlation between the age and the IIEF-5 score (r = -0.142).

Results of analyses

Fig. 3 demonstrates the mean IIEF-5 value for each age group/each AUA symptom score group. Statistical analysis showed no significant differences in the mean IIEF-5 value between any combination of AUA symptom score and age groups, using 2-way ANOVA. Similarly, AUA symptom score and age were

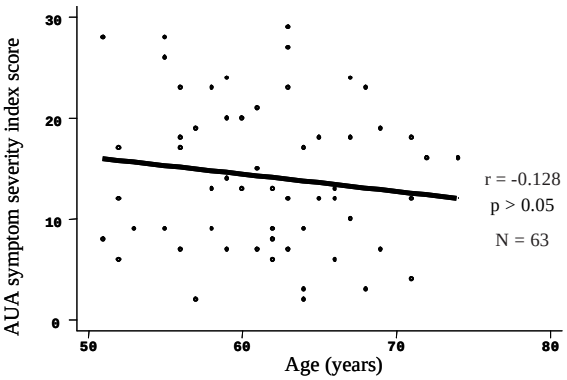


Fig. 1 Scattergram demonstrates the correlation between the age and the AUA symptom score. The statistical analysis using Pearson correlation coefficient reveals no correlation between the age and the AUA symptom score (r = -0.128) and no correlation between the age and the IIEF-5 score (r = -0.142)

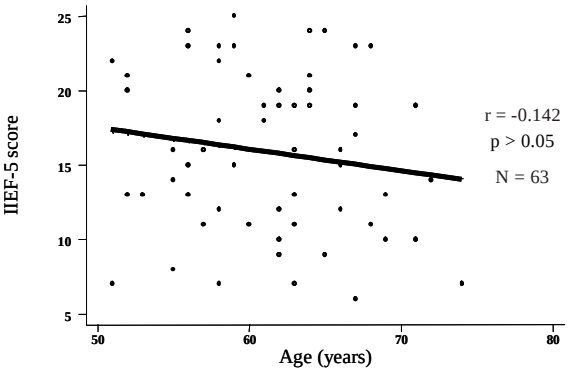


Fig. 2 Scattergram demonstrates the correlation between the age and the IIEF-5 score. The statistical analysis using Pearson correlation coefficient reveals no correlation between the age and the IIEF-5 score (r = -0.142)

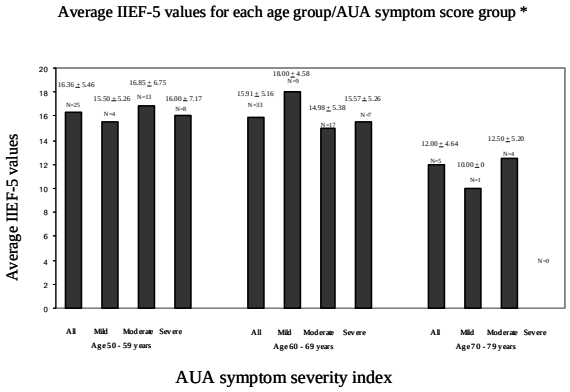
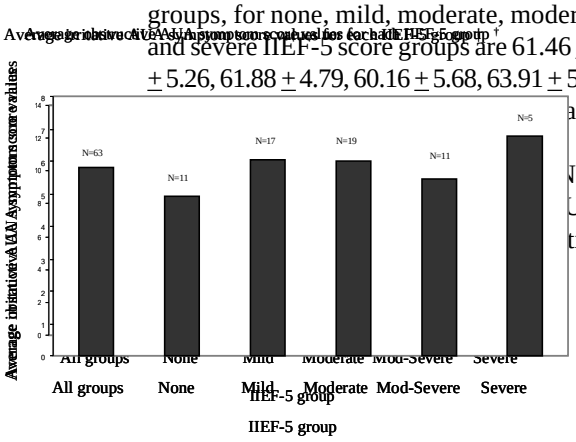


Fig. 3 Average IIEF-5 values for each age group/each AUA symptom score group

* No significant differences in mean IIEF-5 values between any combination of the AUA symptom score and age groups, at the 5% level, by 2-way ANOVA. Note that total number of patients is 63.

not significantly related to IIEF-5 on multiple regression analysis.

Fig. 4 A & B demonstrate the mean obstructive and irritative AUA symptom score values respectively for each IIEF-5 group. The mean ages for all groups, for none, mild, moderate, moderate to severe and severe IIEF-5 score groups are 61.46 ± 5.61, 60.09 ± 5.26, 61.88 ± 4.79, 60.16 ± 5.68, 63.91 ± 5.43 and 62.60 ± 5.26 years respectively. One-way ANOVA analysis showed no significant difference in mean age between any pair of IIEF-5 groups by 1-way ANOVA; and no significant related between IIEF-5 and AUA symptom score (either obstructive or irritative) between any pair of IIEF-5 groups by 1-way ANOVA and for any age by ANCOVA. Similarly, IIEF-5 and age were not significantly related to AUA symptom score on multiple regression analysis.



(B)

Fig. 4 A. Average obstructive symptom value of the AUA symptom score for each IIEF-5 group
B. Average irritative symptom value of the AUA symptom score for each IIEF-5 group

No significant differences in the mean AUA symptom score value (either obstructive or irritative) between any pair of IIEF-5 groups by 1-way ANOVA and for any age by ANCOVA, at the 5% level.

Discussion

LUTS are common in middle-aged and elderly men and are frequently caused by an enlarged prostate. Sexual dysfunction, particularly ED, commonly occurs in the LUTS patients who suffer from symptomatic BPH**.** Moreover, many studies demonstrated that sex lives were spoiled by LUTS[8,9]**.**

ED has been mainly attributed to increased sympathetic vasoconstrictor tone to the helicine arteries supplying the lacunar spaces of the penile corpora cavernosa.[3] Interestingly, Zlotta et al hypothesized that BPH, hypertension and ED may have a common worsening factor: sympathetic overactivity[10]. The authors mentioned that the use of alpha blockers may not only relieve BPH symptoms and hypertension but also decrease the sympathetic tone at the penile level, leading to a relaxation of smooth muscle fibers and an enhanced nitric oxide relaxation which might improve the erectile function of patients with BPH.

Nevertheless, it is unclear whether the erectile dysfunction that frequently occurs with LUTS is due to voiding difficulty, sleeping disturbance, anxiety or a common physiological effect[11]. These spurred the authors to investigate the link between LUTS and erectile function.

The results from the present study demonstrated that the scattergrams of the AUA symptom

and IIEF-5 scores do not correlate with increasing age. These may be caused by the biased distribution of the presented patients in each age group. However, when the analyses were statistically performed in each age group, there were no significant differences in mean IIEF-5 values between any degree of AUA symptom score in the same age group ($p > 0.05$). The present results indicate that there is no association between the degree of LUTS and erectile function, consistent with a previous study of Sairim et al[5]. These authors reported that there was no relationship between sexual function scores and urinary symptom scores prior to treating ED. Interestingly, their patients, who had improvements in erection after successful treatment of ED, reported improved urinary scores. They believed that the improvement of urinary symptoms resulted from an improvement in quality of life rather than the pharmacological effects of the treatment for ED.

Moreover, the statistical analyses of the association between any degree of erectile function and the mean AUA symptom score for either obstructive or irritative symptoms revealed no significant association ($p > 0.05$). These imply that the erectile function does not correlate with either obstructive or irritative AUA symptom scores, inconsistent with the sympathetic overactivity theory which hypothesizes that BPH and ED may have a common worsening factor.

Conclusion

The present study demonstrates that there is no association between BPH and erectile function in any age group, inconsistent with the sympathetic overactivity theory. In terms of arterial etiology for ED in BPH patients, the pathology should be caused by arthrosclerosis rather than the sympathetic overactivity.

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ความสัมพันธ์ระหว่างสมรรถภาพทางเพศและอาการปัสสาวะบ่อยในผู้ชายสูงวัย

สมบุญ เหลืองวัฒนากิจ, อุบลรัตน์ รุ่งเรืองศิลป์, ภาณุวัฒน์ เลิศสิทธิชัย, กฤษฎา รัตนโอฬาร

ยังไม่ทราบแน่ชัดว่าโรคหย่อนสมรรถภาพทางเพศซึ่งพบได้บ่อยในคนไข้ชายสูงวัยที่มีอาการปัสสาวะบ่อย อาจจะมีสาเหตุมาจากภาวะการทำงานที่มากเกินไปของระบบประสาทซิมพาเธติกก็เป็นไปได้ ดังนั้นการศึกษานี้จึงตั้งเป้าที่จะดูความสัมพันธ์ระหว่าง อาการของโรคหย่อนสมรรถภาพทางเพศและความรุนแรงของการปัสสาวะบ่อย หรือ ปัสสาวะลำบากที่พบในชายสูงวัยที่มีต่อมลูกหมากโต

มีคนไข้ชายจำนวน 75 ราย ที่มาด้วยอาการปัสสาวะบ่อยหรือปัสสาวะลำบากลงทะเบียนเพื่อจะเข้าร่วมการวิจัย โดยเก็บข้อมูลตั้งแต่ มิถุนายน พศ. 2541 ถึง มีนาคม พศ. 2543 ทั้งสิ้นมีชายทั้งหมด 63 รายที่สามารถเข้าร่วมการวิจัยนี้ได้ อายุ 51-74 ปี (เฉลี่ย 61.5 ปี) คนไข้ทุกรายจะทำแบบสอบถามความรุนแรงของอาการทางปัสสาวะหรือ American Urological Association (AUA) symptom severity index ร่วมกับการทำแบบสอบถามสมรรถภาพทางเพศ (IIEF-5 questionnaires)

ผลการศึกษาพบว่า AUA symptoms ไม่มีความสัมพันธ์กับสมรรถภาพทางเพศในกลุ่มอายุเดียวกัน โดยไม่มีความแตกต่างทางนัยสำคัญทางสถิติ ($p > 0.05$) ค้านกับสมมุติฐานที่ว่า ภาวะทั้งสองอาจจะมีสาเหตุมาจากภาวะการทำงานที่มากเกินไปของระบบประสาทซิมพาเธติก