

Correlation of self-reported urologic symptoms with systemic health conditions in minority men

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Background: To investigate the correlation between presence and severity of urologic symptoms and self-reported systemic health conditions in minority men.

Methods: Questionnaires were distributed at a Men's Minority Health Fair. Urologic symptoms were assessed with the International Prostate Symptom Score (IPSS), Sexual Health Inventory for Men (SHIM) and NIH Chronic Prostatitis Symptom Score (CPSI). Each was graded as absent/mild [0], moderate [1] or severe [2] by standard criteria for each and totaled for a urologic score (US). Other questions included age, height/weight and queried heart disease, diabetes, anxiety/stress, sleep apnea and neurologic disease. A systemic score (SS) graded each plus obesity for 6 domains (0–2 for each).

Results: A total of 52 men completed the surveys with a mean age of 58.8 (range, 37–76) years. By symptom score criteria, 17 (33%) had 1 urologic condition, 19 (37%) had 2 and 5 (10%) had all 3. Mean total US was 1.9 (range, 0–6) and mean SS was 2.9 (range, 0–10). There was a strong correlation between US and SS (Spearman Rho =0.73, $P < 0.0001$). The hierarchy of systemic condition impact on US was cardiovascular > anxiety > obesity > diabetes > sleep apnea > neurologic. By multivariable analysis, after adjusting for age, each systemic component strongly correlated with the US. The multivariable model with age plus all of the systemic scores predicted US more accurately than with any one of its components alone.

Conclusions: Self-reported systemic health conditions correlate strongly with presence and severity of urologic symptoms in minority men.

Keywords: Benign prostatic hypertrophy; cardiovascular; diabetes; erectile dysfunction (ED); pelvic pain

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Introduction

While men are less likely to seek preventative primary care or care for new symptoms (1), the onset of urologic symptoms such as benign prostatic hyperplasia (BPH)/lower urinary tract symptoms (LUTS), erectile dysfunction (ED) and chronic pelvic pain syndrome (CPPS) will often prompt urologic consultation. These urologic symptoms may often be caused or exacerbated by disorders in non-urologic systems such as cardiovascular, endocrine, psychologic and neurologic

as well as conditions such as obesity and obstructive sleep apnea (OSA). Indeed, the urologic complaint may be the first clinical interaction that unearths cardiovascular disease (2), diabetes (3), OSA (4) or multiple sclerosis (5).

While prior studies have linked prevalence of LUTS, ED and CPPS in men (6–8), as well as association of individual systemic conditions with individual urologic symptoms (9), there has not been an attempt to link multiple conditions together in a true “men's health phenotype”. Furthermore, in such studies participation of minority men with limited

Table 1 Criteria for absent, moderate, and severe for all components of US and SS

Predictor	Absent [0]	Moderate [1]	Severe [2]
Erectile dysfunction	SHIM >17	SHIM 8–17	SHIM 1–7
Lower urinary tract symptoms	IPSS 1–7	IPSS 9–19	IPSS 20–35
Chronic pelvic pain	NIH-CPSI 0–9	NIH-CPSI 9–19	NIH-CPSI 20–35
Cardiovascular	None	Hypertension and/or hyperlipidemia	Coronary artery disease, angina, claudication, shortness of breath
Obesity	BMI <29.9	BMI 30–39.9	BMI >40
Diabetes	Absent	Present and diet controlled	Present and on medication
Stress/anxiety	Absent	Present, no treatment	Present and on treatment
Sleep apnea	Absent	Snoring and somnolence	Diagnosed and treated
Neurologic	Absent	Minimal symptoms	Symptomatic

SHIM, Sexual Health Inventory for Men; IPSS, International Prostate Symptom Score; NIH-CPSI, National Institute of Health Chronic Prostatitis Symptom Index; BMI, body mass index. US, urologic score; SS, systemic score.

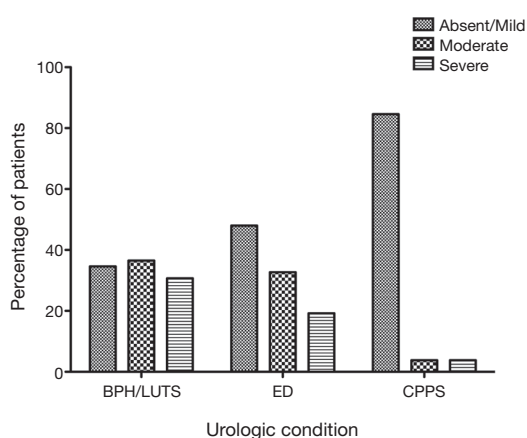


Figure 1 The presence and severity of urologic symptoms in this patient population. BPH, benign prostatic hyperplasia; LUTS, lower urinary tract symptoms; CPPS, chronic pelvic pain syndrome; ED, erectile dysfunction.

access to healthcare is typically low, and indeed their burden of undiagnosed co-morbid conditions may be high.

The purpose of this study was to obtain self-reported urologic symptoms and systemic illnesses from adult men attending a Men's Minority Health Fair. Our hypothesis was that a greater burden of systemic illness would be associated with a higher incidence and severity of urologic complaints.

Methods

Questionnaires were distributed at the Cleveland Clinic

annual Men's Minority Health fair in April 2017 under an IRB approved protocol. Urologic symptoms were assessed with the International Prostate Symptom Score (IPSS) (10), Sexual Health Inventory for Men (SHIM) (11) and NIH Chronic Prostatitis Symptom Score (CPSI) (12). Each was graded as absent/mild [0], moderate [1] or severe [2] by standard criteria for each (Table 1) and totaled for a urologic score (US). Other questions included age, height/weight and queried heart disease, diabetes, anxiety/stress, sleep apnea and neurologic disease. A systemic score (SS) graded each plus obesity for 6 domains (0–2 for each) (Table 1).

Since distribution of the US was not normal, Spearman Rho was used to assess correlation between systemic domains and the total SS with the US. For multivariable analysis, ordinal logistic regression was performed using R 3.4.0. Significance was set at $P < 0.05$.

Results

A total of 52 men completed the surveys with a mean age of 58.8 ± 9.6 (range, 37–76) years. By symptom score criteria, 17 (33%) had 1 urologic condition, 19 (37%) had 2 and 5 (10%) had all 3. The presence and severity of urologic symptoms is plotted in Figure 1 with BPH/LUTS being most common, followed by ED and then CPPS. Mean total US was 1.9 ± 1.6 (range, 0–6) and mean SS was 2.9 ± 2.6 (range, 0–10). Presence and severity of systemic symptoms is plotted in Figure 2 with Cardiovascular being the most common. Men with a higher US [3–6] were older than men with a lower US [0–2] (65.5 ± 1.4 vs. 56.6 ± 1.5 years, $P = 0.003$).

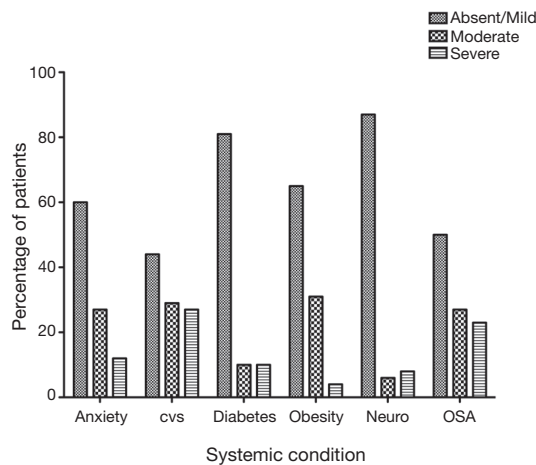


Figure 2 The presence and severity of systemic symptoms in this patient population. OSA, obstructive sleep apnea.

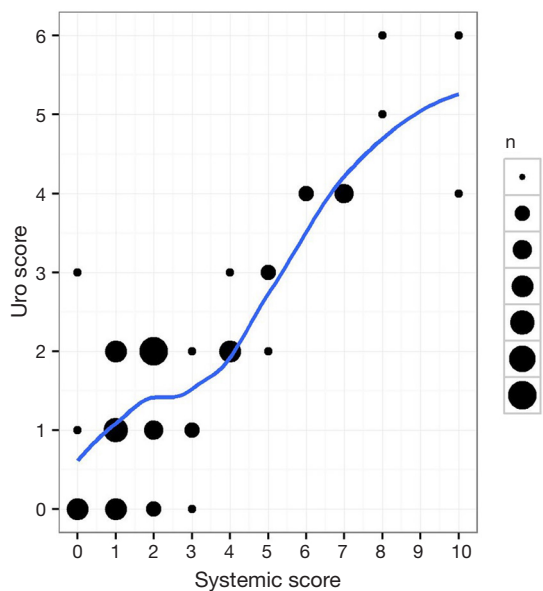


Figure 3 Scatterplot of US versus SS with the dot size related to the count at each dot. US, urologic score; SS, systemic score.

There was a strong positive correlation between US and SS (Spearman Rho =0.73, P<0.0001) (Figure 3). The hierarchy of systemic condition impact on US was cardiovascular > anxiety > obesity > diabetes > sleep apnea > neurologic. By multivariable analysis, after adjusting for age, each systemic component strongly correlated with the US. The multivariable model with age plus all of the systemic scores predicted US more accurately than with any one of its components alone with an odds ratio of 4.01 (2.43–6.63, P<0.0001) and area under

Table 2 Multivariate analysis

Predictor	Odds ratio	95% CI	P value
Cardiovascular	5.72	2.58–12.70	<0.0001
Diabetes	5.11	1.97–13.28	0.0008
Stress/anxiety	6.34	2.74–14.66	<0.0001
Sleep apnea	3.53	1.76–7.06	0.0004
Neurologic	5.30	2.04–13.83	0.0006
Obesity	7.30	2.46–21.67	0.0003
Total systemic score	4.01	2.43–6.63	<0.0001

After adjusting for age, each systemic component strongly correlated with the US.

the receiver operating characteristic curve of 0.863 (Table 2).

Discussion

The relationship between urologic men’s health conditions and specific systemic diseases and health conditions is well established. Anxiety and alarm falsification can exacerbate pain and LUTS (13). Cardiovascular disease and its treatments can cause ED and LUTS and possible CPPS (14). Diabetes can cause both ED through vascular disease and association with low testosterone and LUTS through bladder cystopathy and osmotic diuresis (15). Newer diabetes drugs can also exacerbate LUTS. Obesity is associated with LUTS and ED (16) and weight loss can improve both conditions (17). Neurologic conditions can interact in multiple ways; iatrogenic severed nerves lead to ED, inflamed nerves to pelvic pain (18) and interrupted nerve pathways to neurogenic bladder. Finally, OSA is also associated with ED (4), LUTS (19) and CPPS (20).

Given these associations, a man presenting with urologic complaints has a high chance of at least some of the symptoms being related to chronic systemic illnesses, either through confounding symptoms or through direct etiology. In this study of minority men presenting to a free health fair, we found that self-reported systemic conditions correlated very strongly with the presence and severity of urologic symptoms. This was true for each of the six conditions studied in both univariate and multivariable analyses controlled for age and indeed, by logistic regression, the model with all systemic conditions included was more predictive than any of the individual domains. What are the practical corollaries to these findings? First, that men

presenting with new severe urologic symptoms, especially those with poor access to preventative health care (21), may be at risk for having undiagnosed systemic conditions. Indeed, a recent meta-analysis concluded that men with moderate to severe LUTS were at increased risk for subsequent cardiac events (22). Second, and more importantly for the Urologist, failure to identify and treat these comorbid conditions along with the urologic complaints has the chance to reduce the effectiveness of medical or surgical interventions for the primary urologic complaint.

The major limitations to this study are the modest numbers of respondents and the self-reported nature of the systemic conditions. It is likely that several conditions such as hypertension, diabetes and sleep apnea were under-diagnosed in this group of medically under-served men. We are currently creating a more robust men's health phenotype based upon clinical data that includes bloodwork (i.e., HbA1c, serum testosterone) which will hopefully capture this information more accurately.

In conclusion, self-reported systemic health conditions correlate strongly with presence and severity of urologic symptoms in minority men.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: Questionnaires were distributed at the Cleveland Clinic annual Men's Minority Health Fair in April 2017 under an IRB approved protocol (IRB 17-401). Written informed consent was obtained for publication of this manuscript and any accompanying images from all men who completed the surveys.

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