

Body Mass Index and its Association with Genitourinary Disorders in Men Undergoing Prostate Cancer Screening

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ABSTRACT

Introduction. Elevated body mass index (BMI) may predispose to several pelvic pathologies.

Aims. We tested the association between BMI and five end points, namely, (i) erectile dysfunction (ED); (ii) lower urinary tract symptoms (LUTS); (iii) chronic prostatitis-associated pain (CPP); and ejaculatory dysfunction that is subdivided between (iv) pain/discomfort on ejaculation; and (v) subjectively decreased ejaculate volume.

Methods. Age, height, and weight were prospectively recorded in a cohort of 590 consecutive healthy men undergoing prostate cancer screening. Continuously coded and categorized BMI (World Health Organization classification) were studied.

Main Outcome Measures. Age-adjusted analyses relied on logistic and linear regression models, according to data type.

Results. The average age was 54.1 years (range 30–83). Of all, 296 were overweight (50.2%, BMI 25–29.9 kg/m²) and 85 were obese (14.4%, BMI ≥ 30 kg/m²). After age adjustment, elevated continuously coded BMI ($P < 0.001$) and elevated categorized BMI ($P = 0.01$) were associated with worse erectile function. Conversely, after age adjustment, elevated continuously coded BMI ($P = 0.02$) and elevated categorized BMI ($P = 0.05$) were associated with a lower rate of subjectively decreased ejaculate volume. Finally, after age adjustment, elevated categorically coded BMI was related to lower rates of CPP ($P < 0.001$) and to a lower rate of pain/discomfort on ejaculation ($P = 0.03$).

Conclusions. In men undergoing prostate cancer screening, the effect of BMI on the five end points is not invariably detrimental. Elevated BMI may predispose to ED, but may also decrease the rate of pain/discomfort on ejaculation and may lower the reported rate of subjectively decreased ejaculate volume. Finally, it appeared to have no effect on LUTS. **Bhojani N, Perrotte P, Hutterer G, Suardi N, Jeldres C, Shariat SF, Capitanio U, Arjane P, Widmer H, Benard F, Peloquin F, Montorsi F, and Karakiewicz P. Body mass index and its association with genitourinary disorders in men undergoing prostate cancer screening. J Sex Med 2008;5:2141–2151.**

Key Words. Body Mass Index; Erectile Dysfunction; Lower Urinary Tract Symptoms; Ejaculatory Pain; Chronic Prostatitis

Introduction

Obesity is common in Western countries [1]. According to the World Health Organization (WHO) criteria, more than 30% of adults in the United States are obese. Moreover, over 70% of Americans over 40 years of age are overweight (body mass index [BMI] ≥ 25 kg/m²) [2]. Simi-

larly, obesity is a growing problem in Western European countries [3,4]. Central obesity represents one of several components of the metabolic syndrome [5]. The metabolic syndrome may predispose to several pelvic pathologies, such as erectile dysfunction (ED) and others [6]. Several cross-sectional studies have suggested an association between ED and obesity [7–14]. Similarly, a

link was reported between the metabolic syndrome and lower urinary tract symptoms (LUTS) [15–17]. Moreover, several investigators reported on the association of urological symptoms, ED, and the metabolic syndrome [18–21]. The link between elevated BMI and other male disorders might be equally strong. However, the presence and the strength of this link have not yet been quantified. Therefore, the purpose of the current study was to test for the presence and the strength of the association between established and the novel urological manifestations of the metabolic syndrome. In order to avoid the confounding effect of categorizing patients into diseased and nondiseased groups, we performed two types of analyses. One rested on categorized and the other on continuously coded data.

Aims

We decided to assess the relationship between BMI and five separate end points, namely, (i) ED; (ii) LUTS; (iii) chronic prostatitis-associated pain (CPP); and ejaculatory dysfunction (EjD) that is subdivided between (iv) pain/discomfort on ejaculation; and (v) subjectively decreased (self-reported) ejaculate volume.

Methods

The study cohort consisted of 590 consecutive men without evidence of prostate cancer, who participated in an annual prostate cancer screening event, the Prostate Cancer Awareness Days. Age, height, and weight were prospectively recorded in all participants. BMI was calculated and recorded as either a continuous variable or as defined according to the WHO classification (weight [kg]/height squared [m^2]), as either non-obese (BMI < 24.9 kg/m^2), overweight (BMI 25–29.9 kg/m^2), or obese (BMI \geq 30 kg/m^2). In all analyses, only three BMI categories were used, since very few (11 [1.9%]) severely obese men participated in the event.

The study received Institutional Review Board (IRB) approval from University of Montreal Health Center I.R.B.

Main Outcome Measures

The effect of either continuously coded or categorized BMI was tested in all analyses. ED represented the first end point. Its prevalence was assessed with the self-administered International

Index of Erectile Function (IIEF)-erectile function (EF) scale. The relationship between IIEF was examined in linear regression models, where BMI and the IIEF scale score represented continuously coded variables (Table 1). Since IIEF-EF is also frequently categorized, we reexamined the effect of BMI on the IIEF-EF scale score of <16, which defines moderate to severe ED according to Cappelleri et al. [22]. Logistic regression models were used and the effect of categorized BMI was examined (Table 2). LUTS represented the second end point and its prevalence was assessed with the self-administered international prostate symptom score (IPSS). The relationship between the IPSS score was examined in linear regression models, where BMI and the IPSS scale score represented continuously coded variables (Table 1). Since the IPSS score can also be categorized according to LUTS severity, we reexamined the effect of BMI on the IPSS score \geq 19, which defines severe LUTS [23]. Logistic regression models were used and the effect of categorized BMI was examined (Table 2).

The pain scale score of the Chronic Prostatitis Symptom Index (CPSI) quantified CPP and represented the third end point [24]. The relationship between CPP score was examined in linear regression models, where BMI and the CPP scale score represented continuously coded variables (Table 1). We then categorized the CPP scores according to its median and reexamined the effect of BMI on the CPP score above median. Logistic regression models were used and the effect of categorized BMI was examined (Table 2).

Subjectively decreased ejaculate volume and presence of pain/discomfort on ejaculation represented, respectively, the fourth and the fifth end points. The prevalence of these conditions that contribute to EjD was measured with items 8 and 10 of the Danish Prostate Symptom Score sexual function questionnaire [25]. Because of their inherent binary format (yes/no), these two end points could only be analyzed in logistic regression models. Two models were fitted. One relied on continuously coded BMI (Table 1). The second relied on categorized BMI (Table 2).

Statistical analyses consisted of *t*-tests and of univariable and age-adjusted logistic and linear regression models. BMI represented the main predictor in all models. Continuously coded variables can be either kept in their original continuously coded format or can be categorized. Stratified data can only be examined in categorical format. When two continuously coded variables are examined,

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