

SEXUAL MEDICINE REVIEWS

Prostatic Calculi: Do They Matter?

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ABSTRACT

Introduction: Prostatic calculi (PC) are frequently detected at computed tomography or ultrasound in men attending the health center or the urology outpatient department. PC have attracted more attention from urologists, but the clinical significance of PC is unknown.

Aim: To review the available literature on the effects of PC on prostatic diseases and sexual function in men.

Methods: Relevant clinical trials were identified by searching the PubMed, Embase, and Cochrane Library databases. Results were classified, summarized, and analyzed.

Main Outcome Measures: Transabdominal and rectal ultrasonography; urodynamics analysis; International Prostate Symptom Score; pathologic examination of prostatic tissue; prostate-specific antigen; and expressed prostatic secretion.

Results: PC can not only prolong the duration of bothersome symptoms but also decrease the cure rate of antibacterial therapy in patients with chronic prostatitis. Patients with PC usually have more severe lower urinary tract symptoms (LUTS), and some studies reported that moderate to marked PC are a predisposing factor for moderate to severe LUTS. Studies also reported that the serum level prostate-specific antigen is not influenced by PC. In addition, the presence of PC is not associated with an increased risk of prostate cancer. However, the correlation between PC in the peripheral zone and prostate cancer is statistically significant. In addition, the association between PC and Gleason scores is controversial. Some novel studies suggested that PC might play an important role in sexual impairment in middle-age men or men with chronic pelvic pain syndrome or chronic prostatitis. Recently, PC were found to increase the incidence of severe LUTS, urinary retention, and hematospermia after transrectal ultrasound-guided prostate biopsy.

Conclusion: PC can aggravate LUTS, chronic prostatitis, and sexual dysfunction in men, but the association between PC and prostate cancer is still controversial. **Cao J-J, Huang W, Wu H-S, et al. Prostatic Calculi: Do They Matter? Sex Med Rev 2017;X:XXX–XXX.**

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Key Words: Prostatic Calculi; Chronic Prostatitis; Benign Prostate Hyperplasia; Lower Urinary Tract Symptoms; Sexual Function

INTRODUCTION

Prostatic calculi (PC) are frequently detected incidentally at transabdominal ultrasonography, transabdominal rectal ultrasonography (TRUS), or computed tomography in health examination centers or outpatient urology departments. In general, they are neglected because they are usually asymptomatic. Recently, PC were reported to be found more commonly in patients with benign prostate hyperplasia (BPH), prostate cancer (PCa), or prostatitis.^{1–3} In addition, some studies have

investigated the effects of PC on prostate diseases and sexual function in men.

To our knowledge, no prior articles have provided an overview of the association between PC and prostate diseases and sexual function in men, and this is the first article systematically summarizing their relation. The aim of this article was to review the available literature on the effect of PC on prostate diseases and sexual function in men. These findings might help increase our knowledge of PC and motivate us to pay more attention to its potential effect in men.

METHODS

To perform a systematic review of the available literature on the effect of PC on prostate diseases and sexual function in men, a literature search was performed in May 2017 using the Embase, Cochrane Library, and PubMed databases. The terms *prostate*,

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calculus, calculi, stone, lithiasis, and calcification were searched with the following limits: humans, sex (male), and language (English). 3 authors (J.J.C., W.H., H.S.W.) separately reviewed the records to select the studies. Reference lists of the included studies also were checked manually to identify further studies. Only studies on the incidence and etiology of PC and their underlying associations with prostate diseases and male sexual function were included. The results were classified, summarized, and analyzed.

INCIDENCE OF PC

Whether PC are the direct byproduct of age is not clear, although aging has been positively associated with the presence of PC.^{2,4,5} In a prior review of the etiology of PC published in 1985, Klimas et al¹ reported that PC were seldom seen in children, infrequent in men younger than 40 years, and common in middle-age or older men, which is consistent with the results of some recent studies.^{2,6–8}

The prevalence of PC can be hard to determine because of the different definitions, imaging methods, and samples. In 1979, an autopsy study showed the incidence of PC was 70.1% in black

men from Washington, DC and 29.1% in men from Ibadan, Nigeria and Accra, Ghana,⁹ whereas Sondergaard et al¹⁰ reported PC in 99% of 300 autopsy cases in 1987.

There is no knowledge of the incidence of PC in general screened populations and in patients with some prostate diseases. Therefore, we summarized the incidences of PC in articles published since 2000^{2–4,6,8,11–24} (Table 1). Of the 19 studies listed in Table 1, 14 were from Asia (10 from Korea, 4 from China). It is noteworthy that the incidences of PC among studies are very different, with a range from 7.35% to 88.6%. Geramoutsos et al²³ reported an incidence of 7.35% in patients who attended their outpatient clinics; however, the imaging method used to detect PC was transabdominal ultrasonography but not TRUS, which was believed to be more accurate. TRUS combined with computed tomography or pathologic examination of the prostate appeared to yield a higher detection rate of PC. O'Neill et al¹² reported a PC rate as high as 86.8% in men with PCa who underwent radiotherapy using TRUS combined with computed tomography. In a study by Suh et al,²¹ the pathologic examination of prostatic specimens obtained by prostatectomy or cystoprostatectomy yielded a PC incidence of 88.6%.

Table 1. Summary of the incidence of PC reported in different studies published since 2000

Study	Year	Country	Imaging methods	Subjects	Mean age (y)	Incidence
Lee et al ²⁴	2003	Korea	TRUS	Men without pca and prostatitis	61.9	40.7% (198/468)
Geramoutsos et al ²³	2004	Greece	TAUS	Men attending outpatient clinics	40.1	7.35% (101/1,374)
Shoskes et al ²²	2007	USA	TRUS	Men with CPPS after excluding PC < 3 mm in diameter	46.9	47% (22/47)
Suh et al ²¹	2008	Korea	pathology	Men who underwent prostatectomy or cystoprostatectomy	61.5	88.6% (264/298)
Park et al ³	2010	Korea	TRUS	Men with LUTS after excluding PC < 3 mm in diameter	67.2	41.8% (335/802)
Hwang et al ²⁰	2010	Korea	TRUS	Men who underwent TRUSB	68.4	43.6 (182/417)
Kim et al ⁶	2011	Korea	TRUS	Healthy men	49.5	51.1 (799/1,563)
Zhao et al ⁸	2012	China	TRUS	Men with CBP	37.6	38.7% (41/106)
Hong et al ¹⁹	2012	Korea	TRUS	Men who received TRUS	56.7	41.5% (199/479)
Kim et al ⁸	2013	Korea	TRUS	Men with BPH who underwent TRUS	68.7	71% (159/225)
Yang et al ¹⁷	2013	Taiwan, China	TRUS	Men ≥40 y old who voluntarily underwent TRUS	54.6	60.8% (367/604)
Zhao et al ¹⁶	2014	China	TAUS	Men with CP or CPPS	45.5	48.9% (175/358)
Kim et al ¹⁵	2015	Korea	TRUS	Men who voluntarily underwent TRUS	NA	22.9% (79/346)
Smolski et al ¹⁴	2015	UK	TRUS	Men who underwent TRUSB	67.5	42.3% (197/466)
Gu et al ²	2015	China	TRUS	Men with serum PSA > 4 ng/ml	69.7	47.4% (325/685)
Kuei et al ¹³	2016	Taiwan, China	TRUS	Men with LUTS	65.5	42.9% (48/112)
Park and Choo ¹¹	2016	Korea	TRUS	Men who underwent TRUS	58.2	76.6% (464/606)
Dell'Atti et al ⁴	2016	Italy	TRUS	Men who underwent TRUSB	62.1	25.5 (168/664)
O'Neill et al ¹²	2016	UK	TRUS, CT	Men with pca who underwent radiotherapy	NA	86.8% (210/242)

BPH = benign prostate hyperplasia; CBP = chronic bacterial prostatitis; CP = chronic prostatitis; CPPS = chronic pelvic pain syndrome; LUTS = lower urinary tract symptoms; NA = not available; PC = prostatic calculi; PCa = prostate cancer; PSA = prostate-specific antigen; TAUS = transabdominal ultrasonography; TRUS = transrectal ultrasonography; TRUSB = transrectal ultrasound-guided prostate biopsy; TURP = transurethral resection of prostate.

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