Asian Journal of Surgery (2017) xx, 1–7

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-asianjournalsurgery.com

ORIGINAL ARTICLE

Prostate cancer detection rate in Indonesian men

Chaidir Arif Mochtar [a], Widi Atmoko [a], Rainy Umbas [a], Agus Rizal Ardy Hariandy Hamid [a,*]

[a] *Department of Surgery, Division of Urology, Faculty of Medicine, University of Indonesia, Cipto Mangunkusumo Hospital, Jalan Diponegoro No. 71, Jakarta 10430, Indonesia*

Received 23 August 2016; received in revised form 8 January 2017; accepted 11 January 2017

KEYWORDS
detection rate;
Indonesian men;
prostate biopsy;
prostate cancer;
prostate-specific antigen

Summary *Purposes of the study:* To evaluate the overall detection rate of prostate cancer in biopsies according to serum prostate-specific antigen levels, determine the number of cores biopsied in Indonesian men, and provide a correlated staging of prostate cancer patients at varying intervals of prostate-specific antigen levels.
Methods: We retrospectively analyzed the data from Indonesian men who had undergone prostate biopsy at two national referral medical centers in Jakarta from January 1995 to December 2014. Prostate biopsy was performed when levels of prostate-specific antigen were $>$ 4.0 ng/mL or malignancy was suspected upon digital rectal examination.
Results: Of 2942 men who underwent biopsies, 844 (28.7%) were diagnosed with prostate cancer. When patients were stratified into five subgroups by serum prostate-specific antigen levels ($<$ 4.0, 4.0–9.9, 10.0–19.9, 20.0–100.0, and $>$ 100.0 ng/mL), the overall detection rate of prostate cancer was 21.0%, 9.3%, 13.1%, 35.4%, and 92.9%, respectively. The detection rate was significantly higher in patients who underwent 10-core biopsies than in patients who underwent 6-core biopsies (31.6% vs. 22.4%, $p < 0.001$). The receiver operating characteristic analysis to detect locally advanced/metastatic prostate cancer found that serum prostate-specific antigen levels of 42.7 ng/mL had a sensitivity of 74%, specificity of 73%, positive predictive value of 85.2%, and negative predictive value of 57.5%, with area under the curve of 0.81 (95% confidence interal 0.78 to 0.84).
Conclusion: The overall detection rate of prostate cancer in Indonesian men was 28.7%. The prostate cancer detection rate appeared to be lower than that observed in white men.

* Corresponding author. Division of Urology, Department of Surgery, Faculty of Medicine, University of Indonesia, Department of Urology, Cipto Mangunkusumo Hospital, Jalan Diponegoro Number 71, Jakarta 10430, Indonesia.
E-mail address: rizalhamid.urology@gmail.com (A.R.A.H. Hamid).

http://dx.doi.org/10.1016/j.asjsur.2017.01.001

Please cite this article in press as: Mochtar CA, et al., Prostate cancer detection rate in Indonesian men, Asian Journal of Surgery (2017), http://dx.doi.org/10.1016/j.asjsur.2017.01.001

1. Introduction

According to the GLOBOCAN 2012 statistics, prostate cancer is the third most common urologic cancer in Indonesian men. The incidence of prostate cancer in Indonesia has been increasing rapidly, likely owing to a growing elderly population and better detection methods. The estimated age-standardized incidence rates for the Indonesian population increased from 10.6 (in 2008) to 14.8 (in 2012) per 100,000 men.[1] Despite these facts, the incidence of prostate cancer is still much lower than in Singapore, Korea, Japan, or in white American men.[1–3]

Prostate cancer incidence varies based on ethnicity and region.[4] The incidence of prostate cancer in North American men is 97.2 out of 100,000 men; however, in Malaysian men, who are of a comparably similar race to Indonesian men, the incidence has only been reported to be 10.8 of every 100,000 men.[1]

The serum prostate-specific antigen (PSA) test and digital rectal examination (DRE) are common methods used to screen for signs of prostate cancer. Catalona et al[5] determined that PSA levels of 4 ng/mL is an appropriate cut-off point to indicate a prostate biopsy. Subranges of serum PSA levels have been used to help counsel men with regard to the detection rate of cancer on biopsy, and are commonly used by patients and clinicians to determine the necessity of prostate biopsy.

Although transrectal ultrasound (TRUS)-guided systematic prostate biopsy has been well established as the standard diagnostic tool in prostate cancer, it is undeniable that the six-core biopsy is an inaccurate means of cancer detection (10–30% false negative rate).[6,7] Recently, many investigators have indicated that extended prostate biopsy sampling with eight or more cores might improve the prostate cancer detection rate.[8,9]

Despite the increased likelihood of prostate cancer detection by performing extended biopsy, the appropriate number of cores is yet to be determined. It is expected that increasing the number of biopsy cores would lead to improved cancer detection. Developing a strategy for prostate cancer detection is of vital importance because the risk of detection of latent or insignificant prostate cancer may also be elevated because of false positive results. Additionally, there are no adequate data on the prostate cancer detection rate and PSA levels in an Indonesian population. Therefore, this study was conducted to evaluate the overall detection rate of prostate cancer based on core biopsy and serum PSA levels while evaluating the utility of 6-core and 10-core prostate biopsies in Indonesian men. As a secondary outcome, we also evaluated the detection rate of advanced prostate cancer based on serum PSA levels in order to determine the optimal PSA cut-off value to suggest prostate biopsy to diagnose early stage "curable" prostate cancer.

2. Methods

2.1. Patients

We retrospectively analyzed 2942 Indonesian men who had undergone prostate biopsy at two national referral medical centers (Cipto Mangunkusumo Hospital, Jakarta and Dharmais Hospital National Cancer Center, Jakarta) from January 1995 to December 2014. When PSA levels exceeded 4.0 ng/mL, a TRUS-guided biopsy was performed. Patients with PSA $<$ 4.0 ng/mL also underwent TRUS-guided biopsy if indicated by the DRE results (including induration, asymmetry, irregularity, or nodules suggesting cancer). Patients with a previous prostate biopsy were excluded from the study. The protocol of the study was approved by the local ethics committee (285/UN2.F1/ETIK/2016, The Ethics Committee of the Faculty of Medicine, University of Indonesia). Written informed consent was obtained from all of the patients.

2.2. Biopsy method

Serum PSA levels were measured using the Abbott Architect i2000 (Abbott Laboratories, Abbott Park, IL, USA). Patients were placed in the lateral decubitus position, and TRUS-guided needle biopsy was performed using the Ultrasound Scanner Class I Type B (B-K Medical, REF Type 8818 4–12 MHz, Mileparken, Herlev, Denmark). A spring-fired biopsy instrument (Bard Magnum, Ref MG1522, Bard Peripheral Vascular, Inc., Tempe, AZ, USA) attached to an 18-gauge Bard Magnum Biopsy Needle (Ref MN1820, Bard Peripheral Vascular, Inc.) was used. Transverse and longitudinal section images were obtained. Prior to January 2004, our protocol for prostate biopsy was to perform a six-core biopsy. At that time, we tried to improve our detection rate by increasing the cores biopsied to 10. A proctoclysis enema was given one day prior to the biopsy. Patients taking anticoagulants and antiplatelets were advised to stop their medication 5 days prior to biopsy. Suppository ketoprofen was given 5 to 10 minutes before the TRUS biopsy procedure as a local anesthesia. Prostate biopsy specimens were analyzed by pathologists at the patient's institution. Clinical parameters and pathological features were recorded on the prostate cancer database program developed for this study. Biopsy tissue was considered positive if adenocarcinoma was diagnosed, and the number of positive cores, Gleason score, and grade were reported. All other findings [e.g., high-grade prostatic intraepithelial neoplasia (PIN), atypia, and dysplasia] were considered as negative for prostate cancer.

2.3. Statistical analysis

The detection rates of cancer upon biopsy were obtained and analyzing according to PSA levels and number of cores biopsied. We also compared PSA density between patients who underwent 6-core and 10-core biopsies in the subgroups with PSA $<$ 20 ng/mL. Statistical analysis was performed by applying Chi-square test. A p value $<$ 0.05 was considered statistically significant. For our secondary outcome, we conducted receiver operating characteristic (ROC) curve analysis. We divided prostate cancer staging into two categories as follow: (1) local, which included T1 and T2 prostate cancer without any existence of tumor spreading into the nodes or other organs, and (2) locally advanced and metastatic, which included T3, T4, N1, and M1. The statistics program International Business Machines

Please cite this article in press as: Mochtar CA, et al., Prostate cancer detection rate in Indonesian men, Asian Journal of Surgery (2017), http://dx.doi.org/10.1016/j.asjsur.2017.01.001