
RESEARCH COMMUNICATION

Prostate Specific Antigen for Screening for Prostate Cancer: An Appraisal of Thai Reports

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Abstract

Prostate cancer is the most common cancer in male populations in many parts of the world. It is a slowly growing deadly cancer with very few signs and symptoms in the early stage. For screening, prostate specific antigen (PSA) has been proposed as a marker in the serum. It is widely employed in western countries, but use of PSA for prostate cancer screening in developing Asian countries is not generalized. Here, the author performed an appraisal on the diagnostic properties of serum PSA in screening prostate cancer among the Thais. Four reports from the literature were recruited for further meta-analysis of a total of 1,321 cases. The overall diagnostic activity with regard to sensitivity, specificity, false positive and false negative rates, values being 95.8 %, 66.2 %, 33.8 % and 4.2 %, respectively. Therefore the test has good sensitivity, and sufficiently good diagnostic properties for screening when compared to digital rectal examination (DRE). However, serum PSA cannot be used for a definitive diagnosis, for which pathological confirmation is also necessary.

Key Words: prostate - cancer - PSA - Thailand

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Introduction

Prostate cancer is a common malignancy in males in many parts of the world. This neoplasm is a leading cause of morbidity and mortality and epidemiological studies have pointed to particular geographic and ethnic trends that affect screening/early detection efforts (Sakr, 2004). Of interest, the incidence of prostate cancer in the developing Asia countries is relatively high. Recently, Shirai et al (2002) noted that the importance of dietary factors for prostate carcinogenesis had been proven by epidemiological studies of immigrants from Asia into the USA. They noted that intake of foodstuffs rich in fat, including meat, might be a risk factor (Shirai et al, 2002).

Digital rectal examination (DRE) is the classical method for screening for this cancer. Recently, Muller-Lisse and Hofstetter (2003) noted that German general health insurance still covered digital rectal examination (DRE) in men over the age of 45. Unfortunately, most Asians, including Thais, reject DRE as demeaning and it is therefore considered as a non-appropriate test in laboratory medicine due to poor patient compliance (Wiwanitkit, 2001). Alternative tests therefore need to be developed.

Prostate specific antigen (PSA) is a tumor marker, which has been introduced for screening of prostate cancer in recent

years. An elevated level of PSA is correlated with the presence of prostate cancer. Ryan and Small (2004) studied the serum PSA threshold for prostate biopsy and suggested that a cutoff value of 2.5 ng/mL would double the rate of diagnosis of the disease. Moul (2003) emphasized that it had been a 'PSA era' since 1989, during which the PSA screening test was widely used in clinical practice in the USA. However, the employment of PSA for prostate cancer screening in developing Asian countries is not generalized. Here, the author performed an appraisal of the diagnostic properties of serum PSA for screening for prostate cancer among the Thais, to test the hypothesis that this might be an effective screening test in a developing country. According to the results, it would appear that the test has good sensitivity and is more appropriate than DRE for screening purposes.

Materials and Methods

A literature review to find the previous reports about using serum PSA measurement comparing to standard histological study in screening for prostate in Thailand was performed. The author used the electronic search engine PubMed (www.pubmed.com) in searching for the literature. The author also reviewed the published works in all 256 local Thai journals, which are not included in the

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international citation indices using the database Thai Index Medicus. Reports that did not provide data on diagnostic properties (sensitivity, specificity, false positive and false negative) were excluded. The available reports were extracted for such data and used for further metanalysis.

Concerning the metanalysis study, the overall diagnostic property (sensitivity, specificity, false positive and false negative) was calculated. The SPSS 11.0 for Windows was used for statistical analysis in this study.

Results

According to the literature review, 4 reports were recruited for further metanalysis (Table 1), covering 1,321 cases. The overall prevalence of prostate cancer was 10.8 % (143/1,321), with overall sensitivity, specificity, false positive and false negative rates equal to 95.8 %, 66.2 %, 33.8 % and 4.2 %, respectively (Table 2).

Discussion

The present results indicate that serum PSA, a proteolytic enzyme produced exclusively by human prostatic epithelial cells, has high sensitivity as a marker for prostate cancer in elderly Thai patients. PSA has found application not only in screening for early detection but also for following the clinical course prostate cancer (Wilson and Crawford, 2004). Sakr (2004) noted that the pathology of prostate malignancy

disease had changed significantly since the introduction of PSA more than a decade ago. However, although this test is well known and widely used in many western countries, it is limited distributed in developing Asia, including Thailand.

Concerning the diagnostic property, the overall sensitivity proved to be sufficiently good for screening purposes, with a low false negative rate. Therefore, the author concludes that serum PSA can be recommended in screening for prostate cancer when compared to other tests. However, the false positive rate is high, with benign prostatic hyperplasia (BPH) as the main contributory disease. Thus, serum PSA cannot be used for definitive diagnosis, and pathological confirmation is also necessary for final diagnosis.

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Table 1. Basic Information for Reports Concerning Use of Serum PSA Measurement Compared to Standard Histological Study in Screening for Prostate Cancer in Thailand

Items	Studies			
	Tantiwong et al	Ruangdilokrat et al	Dumrongpisutikul et al	Leewansangtong and Tantiwong,
Study group	Population-based	Community-based	Community-based	Community-based
Character of screenees	General elderly in the community	Geriatric patients with urination complaints	Geriatric patients with urination complaints	Geriatric patients with urination complaints
Year conducted	2002	1997	1994	1997
Methodology for screening	ELISA	ELISA	ELISA	ELISA
Cutting point (ng/mL)	4	4	4	4

Table 2. Main Results of Reports Concerning Use of Serum PSA Measurement Comparing to Standard Histological Study in Screening for Prostate Cancer in Thailand

Items	Studies			
	Tantiwong et al	Ruangdilokrat et al	Dumrongpisutikul et al	Leewansangtong and Tantiwong,
Number of screenees	492	511	216	102
Positives	7	74	40	22
Positive rate (%)	1.4	14.5	18.5	21.6
Sensitivity (%)	85.7	98.0	100	86.0
Specificity (%)	90.5	46.0	74.4	36.0
Positive predictive value (%)	11.5	23.4	23.4	27.1
Negative predictive value (%)	97.6	99.0	100	90.6

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