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Research Article

Perception, Practice, and Attitude Toward Prostate-specific Antigen Test Among Sudanese Urologists

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Abstract

Background: The introduction of prostate-specific antigen (PSA) has revolutionized the diagnosis of prostate cancer (PC). However, there is a wide variation in the daily practice of PSA testing with ongoing efforts to increase its sensitivity. This study aims to evaluate the attitude of Sudanese urologists toward the PSA test in their daily practice.
Methods: An online questionnaire was formed and sent to the academic group of Sudanese urologists; it was left for two months with weekly reminders. The group contains 135 members. Data were then collected and analyzed.
Results: Of the 135 members, 83 (61.5%) responded to the questionnaire, all were males, with 43% of them being consultants, and 37% having an experience between 5 and 10 years. Most participants (85%) use the test according to international guidelines, the majority (60%) counsel patients before the test, with 72% finding the test more than 50% reliable. In addition, >33% face problems when requesting PSA with >29% of them finding it unreliable. Moreover, in >13%, the test is unavailable. Nearly all participants (95%) think that there is a need for national guidelines to regulate the use of PSA test.
Conclusion: For the diversity of practice toward the PSA test and the unavailability of adjunct methods that increase its sensitivity, there is a need for national guidelines to regulate the use of the test in the context of other clinical factors.

Keywords: attitude, prostate cancer, prostate specific antigen, Sudanese urologists

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1. Introduction

The introduction of the prostate-specific test (PSA) has revolutionized the diagnosis of prostate cancer (PC). PC is the second most frequent cancer and the fifth cause of cancer death in men. It represents a significant public health concern worldwide [1, 2]. Prostate biopsy is the gold standard for the diagnosis of PC, and it is classically indicated according to the result of PSA and digital rectal examination (DRE) findings [3, 4]. The

incidence of PC increased because of the widespread use of the PSA test [5, 6]. PSA is prostate-specific, however, it is not PC specific, as it has a considerable number of false positive results [7, 8], and it may be more harmful to the patient because it carries a risk of overdiagnosis and overtreatment, which can compromise quality of life [9]. There is a wide variation in the daily practice of PSA testing with ongoing research to increase its usefulness and to provide the optimal implementation of the test in clinical practice [1].

The field of urology in Sudan witnessed substantial development over the last two decades, as the number of urologists rose to around 200 to 250, this is in addition to the considerable advancement in urology equipment and devices that facilitated the conduction of endourological and laparoscopic urological surgeries. This was accompanied by an improvement in the quality of local training in this field. Despite that, the field of PC management is still relatively lagging, as there is a shortage in the investigation tools that increase the sensitivity of PSA test in the diagnosis of PC. This study aims to comprehensively evaluate the utilization of the PSA test among Sudanese urologists. It will investigate the frequency of PSA test usage, criteria for recommending the test, and variations in interpreting results. Additionally, the research will delve into communication practices with patients, awareness of international guidelines, and challenges faced by urologists in incorporating PSA results into patient management. By scrutinizing these aspects, the study seeks to provide a nuanced understanding of the current landscape, laying the groundwork for proposing informed recommendations toward the formulation of a national guideline and the adoption of a clear policy to ensure proper use of the available limited facilities to provide the best for our patients. To the best of our knowledge, this is the first study in Sudan that evaluates the practice of Sudanese urologists toward PSA test.

2. Methods

A questionnaire was developed and piloted with a sample of five senior urologists from Sudan and outside Sudan. The questionnaire was then sent electronically to an academic group of Sudanese urologists after an orientation message about the aim of the study. The questions were designed mainly in multiple choice and Likert scale format. The total number of questions was 30, including demographic questions. Reminders were sent out regularly every week for a total of two months. The group contains 135 members. The study was approved by the medical ethics committee of the University of Gadarif, Faculty of Medicine, Sudan (reference: GU/FM/REC/Q2.6.22.1).

Before answering the questionnaire, the participants were informed that their privacy would be respected. All responses were anonymous to maintain the confidentiality of the participants. Data were recorded and analyzed using Stat statistical software (Stata Corp. 2021. Stata Statistical Software: Release 17).

TABLE 1: Demographic and practice characteristics of the participants.

		Frequency	Percentage
Rank of participant	Consultant Senior Specialist Specialist	36 25 22	43.37% 30.12% 26.51%
Age of participant (yr)	30–35 36–40 41–50 >50	6 22 36 19	7.23% 26.51% 43.37% 22.89%
Gender	Male	83	100%
Years of experience in urology field (yr)	<5 5–10 11–20 >20	29 31 16 7	34.94% 37.35% 19.28% 8.43%
Place of practice	In Sudan Outside Sudan	62 21	74.70% 25.30%
Place of practice in Sudan	In Khartoum Outside Khartoum	44 18	70.97% 29.03%
Place of practice outside Sudan	Arab countries Western countries	18 3	85.71% 14.29%

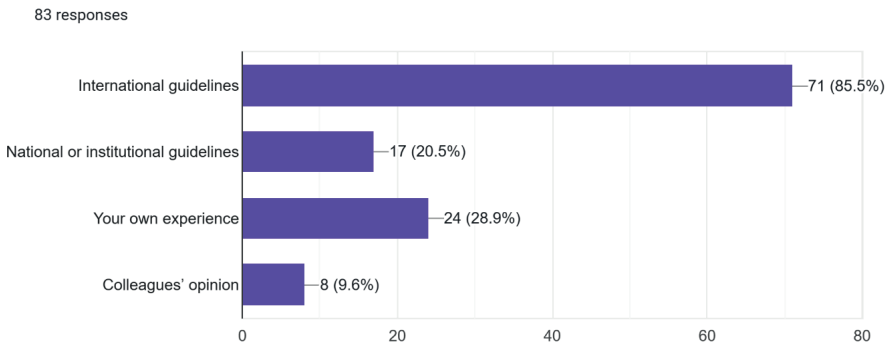

Figure 1: Factors influencing use of PSA test among Sudanese urologists.

3. Results

In total, 83 (61.5%) of the 135 contacted urologists completed the online questionnaire. Table 1 shows the characteristics of participating urologists. All of them were male, 43% (*n* = 36) of them were consultants, 30% (n = 25) were senior specialists, and 26.5% (*n* = 22) were specialists. Most participants (37% [*n* = 31]) had an experience of 5–10 years,

Table 2: Attitudes of urologists toward PSA testing and its result use in their practice.

		Frequency	Percentage
Regarding PSA test and DRE, what do you do first?	Both, independently DRE PSA	35 34 14	42.17% 40.96% 16.87%
Do you counsel the patient fully before requesting PSA?	Almost always Usually Often Rarely Almost never	22 29 14 14 4	26.51% 34.94% 16.87% 16.87% 4.82%
Do you think PSA results in your practice are reliable?	<10% reliable 10–50% >50% reliable	0 23 60	0% 27.71% 72.29%
How often you do surgery for benign prostate without PSA testing?	Almost always Usually Often Rarely Almost never	2 9 14 21 37	2.41% 10.84% 16.87% 25.30% 44.58%
How often you use PSA for follow-up of a patient with BPH on medical treatment?	Almost always Usually Often Rarely Almost never	9 24 9 29 12	10.84% 28.92% 10.84% 34.94% 14.46%
Do you review the patient records ascertaining PSA tests before any patient intervention?	Almost always Usually Often Rarely Almost never	44 27 9 2 1	53.01% 32.53% 10.84% 2.41% 1.20%
How often you diagnose malignant prostate postintervention for the benign?	Almost always Usually Often Rarely Almost never	4 4 17 54 4	4.82% 4.82% 20.48% 65.06% 4.82%
In your PRACTICE, do you face any problems when requesting a PSA test?	No Yes	46 37	55.42% 44.58%
Do you think that there is a proven reduction in prostate cancer-related mortality by early detection based on PSA testing?	Yes Not sure No	42 21 20	50.60% 25.30% 24.10%
If you have to re-check a high PSA result, what is the most suitable time to check PSA? (weeks)	<1 week 1–2 >2	0 10 43	0% 18.87% 81.13%
What is your PSA cutoff value to recommend a biopsy? (ng/ml)	4–10 11–20 21–50 >50 It depends on other factors	9 33 5 4 32	10.84% 39.76% 6.02% 4.82% 38.55%
The rate of detecting prostate cancer in relation to the number of biopsy procedures you do is roughly:	<25% 25–50% 51–75% >75%	11 26 29 17	13.25% 31.33% 34.94% 20.48%

Table 2: (Continued).

		Frequency	Percentage
Do you use any risk calculation system to help you in patient selection for biopsy to avoid unnecessary biopsy?	No Yes	49 34	59.04% 40.96%
If you use a risk calculation system, do you find it:	Effective Equivocal Not effective	21 12 1	61.76% 35.29% 2.94%
If you are not using a risk calculation system, the reason is:	I have no knowledge about it Not recommended in my institute I try it and find it not effective Almost all patients present late Not familiar Only support decisions Too much workload	20 16 6 1 1 1 1	43.48% 34.78% 13.04% 2.17% 2.17% 2.17% 2.17%
Would you take the PSA test for yourself or planned to do it?	Maybe No Yes	30 28 21	37.97% 35.44% 26.58%
Are you satisfied about your practice regarding your policy toward PSA test?	Yes Maybe No	71 7 5	85.54% 8.43% 6.02%
Do you think that there is a true need for a national or at least institutional guideline to determine the best practice policy toward PSA test and its result application?	Yes No Maybe	79 3 1	95.18% 3.61% 1.20%

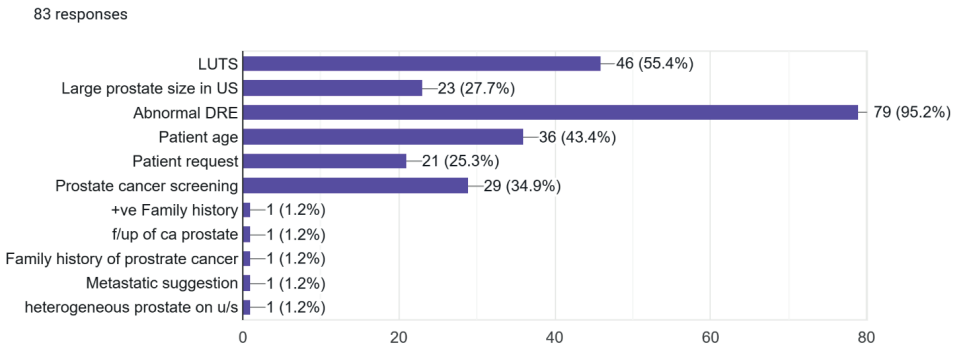

Figure 2: The most frequent indications of PSA test in daily practice of the participants.

74.7% (*n* = 62) work in Sudan, and 71% (*n* = 44) of them practice in Khartoum while the rest are outside Khartoum. Additionally, 25% (*n* = 21) work abroad, and 85% of them in Arab countries. The use of the PSA test is influenced by international guidelines in 85.5% (Figure **1**) with >95% (*n* = 79) of the participants requesting PSA for patients with abnormal DRE and >55% (*n* = 46) requesting the test for patients with LUTS (Figure **2**). Table 2 shows the attitude of the Sudanese urologists toward the test, 35% (*n* = 29) usually counsel the patient fully before the test, >26.5% (*n* = 22) always counsel them,

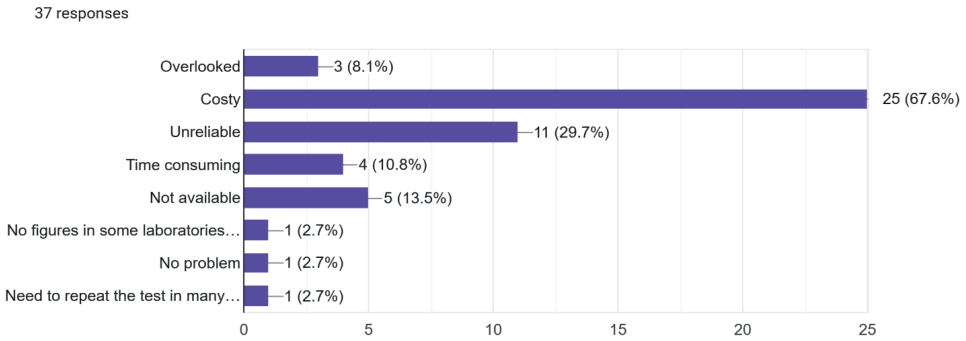

Figure 3: The problems that face the participants regarding PSA test.

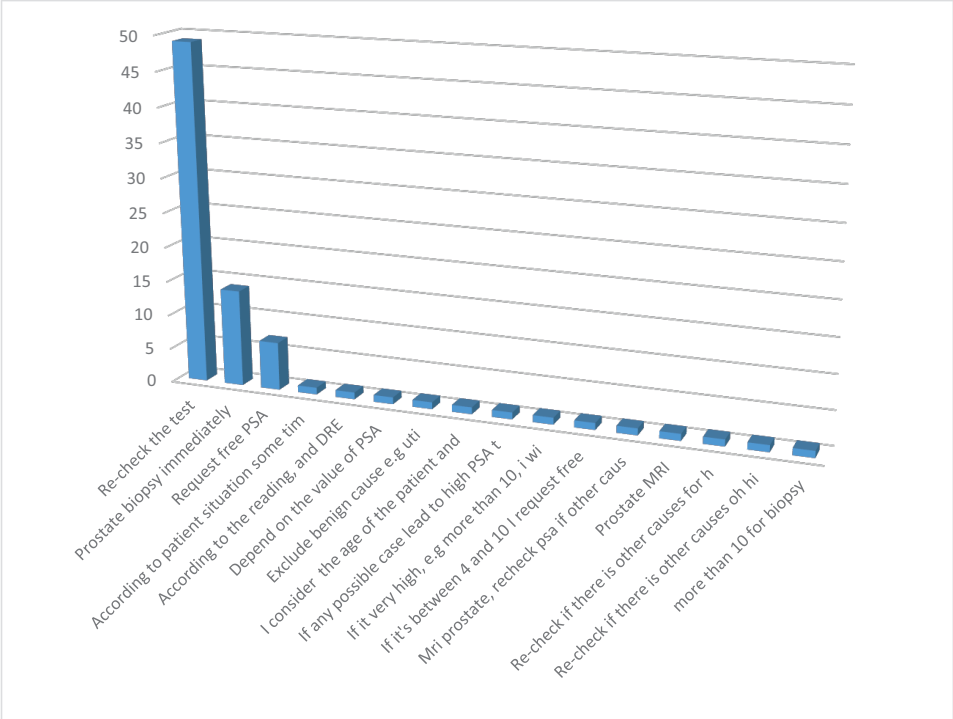

Figure 4: The next action after high PSA result according to the practice of the participants.

and most of them (72%) found the test >50% reliable, even though >20% diagnosed malignant prostate post-intervention for benign. Most of the participants in this study (45%) don't do surgery for benign prostate without a PSA check, while about 50% rarely or almost never use PSA for follow-up of patients with benign prostate. About 45% of the participants face problems when requesting the test, as 68% found it costly and about 30% found it unreliable (Figure **3**). About 51% of the participants believed there is a proven reduction of PC-related mortality by early detection based on PSA testing, while 25% and 24% are not sure or don't agree with this, respectively. About 58% of the participants in this study re-check the test when they find a high initial result,

while 17% proceed to prostate biopsy with one high result [Figure **4**]. About 40% of the urologists take PSA value of 11–20 ng/ml as a cutoff value to recommend biopsy while 39% correlate between PSA value and other factors to recommend a biopsy. Nearly all (95%) respondents think that there is a true need for a national or at least institutional guideline to determine the best practice policy toward the PSA test and its result application.

4. Discussion

The PSA test was introduced in 1988 leading to an improvement in people's awareness and detection rate of early-stage PC, the age-adjusted PSA level was introduced in 1993 [10, 11]. Guidelines suggest shared decision-making after patient counseling and an explanation of the pros and cons of PSA testing [5, 12], because patient orientation may affect their decision to take the test or not, and this was substantiated by certain studies that showed a decrease in patient interest to take the test after proper counseling and explanation [7, 13]. This study showed that most Sudanese urologists (85.5%) are influenced by international guidelines in their practice toward PSA test, most of them counsel the patient fully before requesting PSA (35% usually and 27% always), and the most frequent indications of PSA in their practice are abnormal DRE (95%), LUTS (55%), and patient age (43%). Although it mainly results from benign causes, LUTS represent one of the most frequent indications of the PSA test, this is justified by the possibility of coexisting early PC [14, 15]. PSA alone performs poorly to detect PC in men with LUTS [14]. As advanced age is associated with a higher risk of PC and a high Gleason score, it is postulated that age can be considered as an independent factor to stratify the patient's risk of significant PC [16].

The use of PSA kinetics, derivatives, and MRI can substantially increase the sensitivity of PSA in detecting significant PC [17, 18]. There is no uniform cutoff level for PSA to be applied for all men to proceed for biopsy, so it should be determined on a case by case base [17]. Moreover, it is suggested that at least two high PSA measures are required before biopsy, because repeating PSA test may result in low levels that did not require further investigations in 25% of men with an initial high result [4, 17]. Moreover, 58% of the participants in this study repeat the test when the initial result is high, of them 78% repeat it after 2 weeks, and they highly suggest repetition of the test in patients with urinary tract infection, urine retention, catheterization, and 7.5% of them repeat the test routinely. Seventeen percent proceed for biopsy after one result of high PSA and 8.5% request free PSA. Some studies showed that about one-third of men offered biopsy on

the base of elevated PSA result have a normal biopsy [5], in our study, 45% of urologists discovered cancer in <50% of biopsy procedures conducted by them. Since, most cases of PC advance very slowly, if not at all [19], and there are no specific symptoms for PC [20], there is considerable ongoing research to find new diagnostic markers for significant PC to reduce the number of biopsies and overdiagnosis of insignificant PC [4].

Risk calculation systems are one of the methods created to stratify the patients at risk of PC, these systems consider the PSA in the context of other risk factors like age, DRE, prostate volume, and prostate biopsy status aiming to reduce the number of unnecessary biopsies [3]. European randomized study of screening for prostate cancer (ERSPC) and prostate cancer prevention trial (PCPT) are two well-recognized risk calculators that have been validated and have promising results [21]. Owing to the relative accessibility, availability, and affordability of the variables that comprise the base of risk calculation systems, it is suggested to be more suitable in low resources settings. Despite that, 58% of the participants in this study don't use a risk calculation system for patient selection, 42% of them because of too much workload, and 36% do not know about it; conversely, 42% use risk calculation with 57% of them finding it effective.

Furthermore, 34% of the participants face problems regarding the PSA test, as 68% found it costly, 30% found it unreliable, and for 13.5% the test is not available. This is in addition to the unavailability of adjunct methods like free PSA and MRI that increase the sensitivity of the test. Owing to this and the diversity of practice toward PSA test, 95% of the participants think that there is a true need for national guidelines for PSA test that consider the available facilities to mitigate the effect of the shortage of adjunct methods, making use of the related clinical factors to increase the sensitivity of PSA test in detecting significant disease and to avoid unnecessary biopsies.

This study might be limited in a number of ways. First, there's a chance that the sample size of urologists used was not representative of all Sudanese urologists, which could restrict how broadly the results can be applied. Second, there exists a potential for self-reporting bias, which could heighten the likelihood of memory bias or social desirability bias, thereby impacting the precision of answers. Lastly, urologists' opinions of the PSA test may be influenced by socioeconomic variables and limitations in the healthcare system.

5. Conclusion

This study showed that there is a clear diversity in practice toward PSA test among Sudanese urologists. Moreover, there is a significant shortage of adjunct methods that increase the sensitivity of the test, and this may result in the perennial dilemma of overdiagnosis of insignificant disease and the potential risk of underdiagnosis of significant disease with the consequences of both. To mitigate this problem, a logical and standardized approach to clinical risk factors can allow for more accurate risk stratification that can reduce the number needing a biopsy without impacting the detection of significant diseases.

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Ethical Considerations

The study was approved by the medical ethics committee of the University of Gadarif, Faculty of Medicine, Sudan (reference: GU/FM/REC/Q2.6.22.1).

Competing Interests

None.

Availability of Data and Material

Data and materials supporting the conclusions are available from the corresponding author on reasonable request.

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