

## **EDITORIAL**

### **THE IMPACT OF TRUS IN DETECTION OF PROSTATE CANCER IN GEZIRA, SUDAN**

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#### **ABSTRACT**

**Introduction:** Prostate cancer (P ca) is the most commonly diagnosed visceral cancer worldwide. It is the second cause of cancer death in men.

**Objective:** To study the impact of introducing transrectal ultrasound (TRUS)-guided biopsy in detection of Prostate cancer in Central Sudan.

**Methods:** This was a retrospective hospital based study. A review was done for data of prostate cancer patients treated in the Institute of Nuclear Medicine and Oncology & Gezira Hospital of Renal Diseases & Surgery (GHRD&S), Wad Medani, Sudan during the years 2002-2007. Comparison was done between the data available before and after introduction of trans rectal ultrasound biopsy, TRUS in 2005.

**Results:** Prostate cancer cases were contributing for only 8% of all cancers during the time period before TRUS introduction. During the year 2007 the figure increased to 14%. The leading cancer in males now is the P ca. previously it was the third registered cancer before TRUS was introduced. The detection of new cases per year increased dramatically after the introduction of TRUS service.

**Conclusion and recommendation:** Prostate cancer was found to be the most common cancer in Sudanese males. TRUS guided biopsy contributed significantly in early detection of prostate cancer in this region. Distribution of this facility with adequate training of the staff optimizes a proper and early detection of prostate cancer.

**Key words:** prostate cancer, TRUS, PSA

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### **INTRODUCTION**

Prostate cancer (Pca) is the second leading cause of cancer-related deaths among men in Western countries. The annual incidence rates in 2000 ranged between 19 and 55/100 000 men<sup>1, 2</sup>.

Pca is already a major health and social problem, and it will become even more important due to the ageing of the population<sup>2</sup>. Although there are some differences in between countries, the incidence of Pca has been increasing over the years<sup>3</sup>. This increase has been suggested to result from improved detection of Pca following transurethral resection of the prostate (TURP) and more recently increased screening using Prostate Specific Antigen (PSA). Long life expectancy and environmental carcinogens contributed to the increased incidence<sup>4, 5</sup>.

Early detection of Pca may help to reduce morbidity from prostate cancer, and prevent morbidity associated with urological dysfunction, bleeding, obstruction and pain associated with metastasis<sup>6</sup>. However, there are likely to be adverse effects e.g. anxiety associated with other outcomes of a screening test e.g. false positive, false negative and truly positive<sup>7</sup>.

Widespread use of serum PSA has certainly increased prostate cancer detection resulting in a considerable stage migration<sup>8</sup>. Such results would not have been achieved without the contemporary refinements of the technique of prostate biopsy. After the initial introduction of the sextant biopsy technique by Hodge, little refinement of the technique was made until Stamey who introduced the TRUS<sup>9, 10</sup>.

Transperineal biopsy (TP) is unusual. Theoretically, the direction of transperineal biopsy might be better than transrectal (TR) route because they sample longitudinally the peripheral zone of the prostate. Initially transperineal route was demonstrated to be less accurate than TR in identifying hypo echoic lesion<sup>10, 11, and 13</sup>.

Transrectal grey scale U/S guided biopsy is the standard method for diagnosing prostate cancer in patients with elevated PSA and/or abnormal digital rectal examination. Various biopsy strategies have been devised to increase the diagnostic yield of prostate biopsy, including sampling of visual abnormal areas, more lateral placement of biopsies, anterior biopsies and obtaining an increasing number of cores, ranging from- region sampling to saturation biopsies with up to 45 cores<sup>12, 13, 14, 15</sup>.

In Sudan the diagnosis of Pca is still not yet optimized , in Gezira hospital in Wad Medani there is a guide line adopted mandating the use of TRUS biopsy, F/T PSA (free & total) and prostate acid phosphatase (PAP) were evaluated in Sudanese patients in study done in our centre<sup>16</sup>.

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### **PATIENTS AND METHODS**

This study was a retrospective cross sectional hospital based one, done through the combined clinic of Urology-oncology conducted by Institute of Nuclear Medicine and Oncology (INMO) and Gezira Hospital of Renal Diseases & Surgery (GHRD&S).all patients underwent TRUS biopsy in 2005-2007 were included. The total number was 624 patients were enrolled. All underwent TRUS biopsy for the prostate.

The European association of urology (EAU) guideline was adopted concerning inclusion and exclusion from the biopsies, with certain modifications according to the facilities available for us. We used to estimate PSA for all patients with lower urinary tract symptoms (LUTS) over 50 years old, any patients with prostatic enlargement and abnormal DRE examination and/or recurrent prostate. TRUS was provided by the International Urology Association auspice by professor. Khalaf, hence TRUS Biopsy with sextant cores biopsy under local anesthesia or local infiltration with lidocaine were taken

The indication for TRUS biopsy was for cases of PSA more than 4 ng/L, for cases with abnormal DRE even with PSA less than 4 ng/L and/or for recurrent prostate.

All biopsies were sent to the histopathology department, repeated biopsies were conducted in certain conditions where the results were apparently paradoxical to the clinical and PSA results. Biopsy delivery to the histopathology was the responsibility of patients themselves.

Once the diagnosis was established, the patients were referred to the combined clinic. All patients were addressed and treated in the combined clinic except those who either missed or also defaulted or Salk medical advice in another center.

Preparation of the patients was done at the outpatient clinic including; enema, explaining the procedure, local anesthesia and local care. A training course was conducted to optimize the skill of the staff for the procedure .prophylactic antibiotic was a routine prior to the procedure. Minor analgesia and antibiotics were given after the biopsy. There was no mortality due to the procedure. Data of the patients were kept in both hard and soft copies in the registry of the hospital. Records were reviewed for cancer prostate registry in INMO for year 2002 to 2007. Analysis of data was done through SPSS and different ANOVA tests were used.

### **RESULTS**

In the 2005 and mid half of 2006, 75 cases were performed. In the last half of 2006 after the avail of TRUS, 238 were done with approximate 53 new cases been discovered and referred to the combined urology-oncological clinic. During 2007, 311 cases of TRUS biopsies were done and the number of diagnosed cancer cases was 65. (table1).

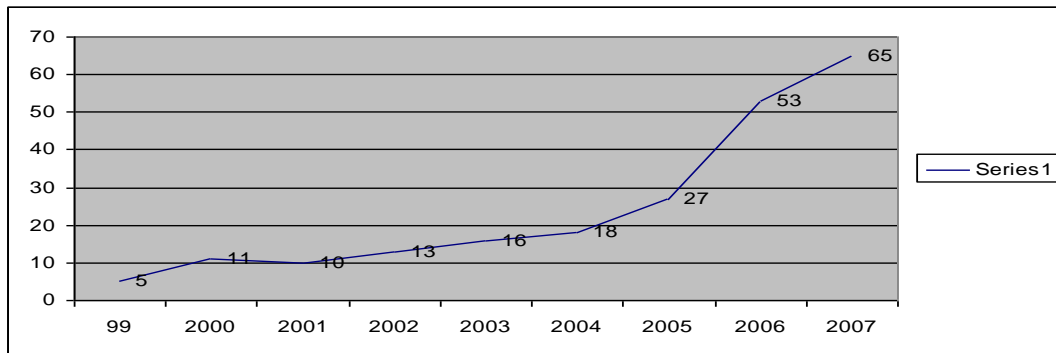
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**Table 1:** Percentage of prostate cancer in relation to total male cancers INMO(2002-2007)

years	Number of prostate cancer(%from male cancers)
2002	13 (8.1)
2003	16 (8.4)
2004	18 (8.3)
2005	27 (9.5)
2006	53 (14.6)
2007	65 (17.3)

We recognized several causes of incompliant patients who disappeared either because of financial impact or unawareness so part of the results may be missed from the records. The morbidity of the procedure included minor anal pain, haematuria in some cases and haematospermia no mortality.

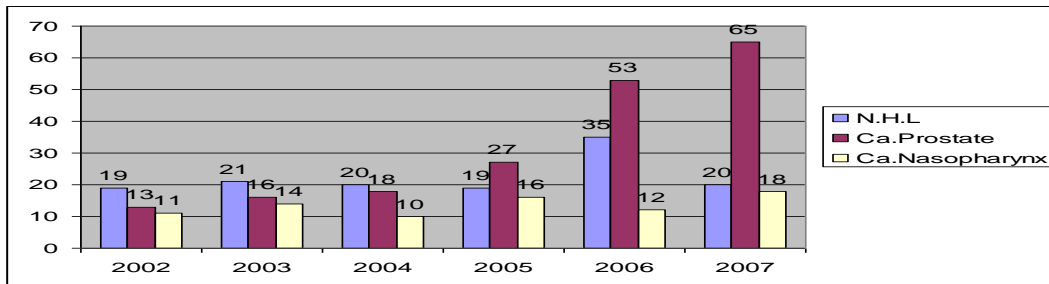
**Fig.1:** Total number of Prostate cancer cases in years 2002-2007. INM



Number of cases diagnosed per year during years 2002-2004 were static, number started to rise in

2005- 2006 with spike in 2007 (Figure 1).

**Fig.2:** Prostate cancer in relation to the most common male cancers- INMO



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Prostate cancer ranked number two in the top 10 commonest cancers in males treated at INMO, this had been the case for years 2002-2004 which alone constitutes 18(8.3 %). In 2005 the prostate cancer took the lead 27(9.5 %), and continued through years 2006 with peak in 2007 (65/17.3%).. While the non-Hodgkin lymphomas and nasopharyngeal cancers remained fluctuating within small range of frequency through the study period. There was a surge in the number of cases diagnosed having prostate cancer in the years 2005-2007 (Figure 2).

Prostate cancer has been detected with increasing frequency, due in part to the widespread availability of serum prostate specific antigen (PSA) testing. Incidence was static between 2002 and 2005, has been rising in percentage annually since 2005, and peaked in 2007 (figure 2 & table 1).

## **DISCUSSION**

Prostate cancer (Pca) is recognized as one of the major health problem facing the male population<sup>17</sup>. The incidence rate has risen steadily over the last 15 years, although the degree to which this rise reflects increased detection and/or a true increase in risk remains uncertain<sup>18</sup>. Data from the United State, Africa and the Caribbean demonstrate that significant ethnic variations for prostate cancer risk exist, the incidence rates for American Black is 55% greater than white<sup>18, 19, 20</sup>.

Historically (1967-1984), Pca was not considered among the top 10 commonest cancers in Sudan as reported by Hamad<sup>21</sup>. Recently in the period 1984-2004 the prostate cancer was at the bottom of the top 10 common male cancer<sup>22</sup>.

With the advent of prostate specific antigen PSA the number of patients whom underwent prostate biopsy had dramatically increased. Other possible factors may include awareness of the population and improvement in other diagnostic techniques like ultrasound, CT and MRI. The sextant biopsy technique has been conventionally used for the diagnosis of prostate cancer<sup>22</sup>. The inauguration of Gezira Hospital for Renal Diseases and Surgery (GHRD&S) was in 2005 availed the introduction of trans rectal ultrasound (TRUS). Before this time blind transrectal biopsies were used for establishing a diagnosis of prostate cancer.

Before the inauguration of GHRD&S and the introduction of regular prostate specific antigen (PSA) assessment and trans-rectal ultrasound (TRUS) guided Biopsy, the diagnosis of prostate cancer used to be furnished through crude circumstantial evidence based on clinical work up & digital rectal examination. The biopsy provided for the pathologist through the rectum guided by just the finger using tru-cut needle blindly taking one or two cores from either firm, nodular and or randomly elsewhere from the prostate lobes. Also from patients underwent open prostatectomy or (TURP) as a treatment of benign prostate hyperplasia.

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The total number of patients underwent TRUS biopsy was 624 only 145 of them with histopathological evidence of cancer. This as yet never tell the exact number of new cases because still the biopsies were served by the patients themselves or their relatives to be handled to the histopathology. Therefore a significant number of cases were lost by the problems such as negligence, poor compliance, financial drawback, poor counseling and movement of patients to another hospital inside or abroad.

Medical insurance is available to shoulder the expenses of this procedure to a large sector of patients. We provide this service with devaluated cost and even free for patients confirmed not affording it.

Before the introduction of TRUS services, prostate cancer the 5<sup>th</sup> cancer in cancer registry in INMO, but after 2005 it rose from 8.1% in 2002 to 14.6% in 2006 and 17.3% in 2007. Still the problem of unique system of registry, referral format and the methods used for the diagnosis is to be addressed in order to furnish an optimal detection rate of cancer. Is this the final picture for PCa in this region of Sudan? It is early to answer this but, still many patients doesn't have access to undergo TRUS-guided biopsy and need not to forget that TRUS in many hands has a low sensitivity<sup>23, 24</sup>.

The other important point which needs more in depth review is to look for the benefit of TRUS-guided biopsy in improving stage at presentation.

## **CONCLUSION& RECOMMENDATIONS**

Pca is quite common in Sudan and many cases were and will remain undetected. Optimizing diagnostic services will enhance early diagnosis.

Further studies to discover potential risk factors for PCa in Sudan are recommended.

TRUS biopsy services improved the rate of cancer detection in GHRD&S

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