



Caudal Block for Digital-guided Transrectal Prostate Biopsy

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Authors' contributions

This work was carried out in collaboration among all authors. Author POA conceptualized and designed the study, wrote the protocol and the first draft of the manuscript. Authors JMA, SAD and TVA managed the literature searches. Authors POA, PTA and SAD analyzed the study data. Authors POA, PTA and SAD wrote the final manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Objective: To assess the effectiveness and safety of caudal block on the pain associated with digital guided transrectal Tru-Cut biopsy of the prostate.

Subjects and Methods: Over a two year period, from July 2013 to June 2015, a cross-section of one hundred and forty men undergoing digital guided transrectal prostate biopsy under caudal block were recruited into the study. 15 ml 1% lignocaine was injected for caudal block. Pain scores, anal sphincter tone and patient satisfaction were assessed and complications recorded.

Results: The mean \pm SD (min-max) biopsy time was 12.1 (8-16) minutes. The mean \pm SD (min-max) pain score on visual analogue scale (VAS) was 1.2 \pm 1.6 and 85% of patients reported

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excellent satisfaction. There was no statistical significance between pain score and age ($P= 0.185$) or the number of biopsies taken ($P= 0.164$). Malignancy was found in 37.1% of patients.

Conclusion: Caudal block is an effective and safe method of anesthesia for digital guided transrectal prostate biopsy.

Keywords: Caudal block; regional anesthesia; prostate biopsy; transrectal ultrasound.

1. INTRODUCTION

Prostate biopsy is the procedure done to take tissue for histologic diagnosis of prostate diseases and it is the gold standard for prostate cancer diagnosis [1]. Trans-rectal ultrasound (TRUS) guided biopsy is the standard procedure and in more advanced centres, the fusion of magnetic resonant imaging (MRI) with TRUS allows the direct targeting of suspicious lesions, which has been shown to improve the detection of clinically significant prostate cancer [2]. However in resource poor centres like ours, this can also be done with digital guidance in the absence of a rectal probe.

Prostate biopsy requires some form of anaesthesia because it is a painful procedure as up to two third of patients undergoing prostate biopsy will experience moderate to severe pain [3]. Possible causes of pain during trans-rectal prostate biopsy include; digital stretching of the anal sphincter, TRUS probe insertion and the piercing of the prostate gland by the Tru-cut needle. The pain from the stretching of the anal sphincter can be severe enough to cause a vagal response, Bezold Jarisch reflex, resulting in cardiovascular depression with vasodilation and bradycardia [4].

The safety and effectiveness of caudal anaesthesia for prostate biopsy have been reported by Ikuero et al. in Lagos, Nigeria [5]. However, no such work has been done in Ekiti State University Teaching Hospital (EKSUTH) which is an emerging tertiary hospital in a suburban setting in Nigeria. Government sponsored health education, has led to increased number of men voluntarily requesting prostate cancer screening in our environment. It is, therefore, imperative to determine the safety, acceptability and effectiveness of the form of anesthesia under which this procedure is done.

2. SUBJECTS AND METHODS

This was a prospective cross-sectional study of 152 patients undergoing prostate biopsy at Ekiti State University Teaching Hospital,

Ado-Ekiti Nigeria. Informed consent was obtained after explanation of the procedure and possible complications to the patient. The study was performed between July 2013 and June 2015. Exclusion criteria included wound/sepsis at lumbosacral region, perianal discharge, paraparesis, antecedent adverse reaction to local anaesthetic agent, use of anticoagulant/antiplatelet and refusal of informed consent. Prostate biopsies were taken with 16G Tru-cut needle (Anhui Kangda Medicals Ltd, China).

2.1 Caudal Block Technique

Caudal block anaesthesia was performed on outpatients basis in prone position. The lower back was prepared and draped. The sacral hiatus was identified by palpation using an imaginary equilateral triangle between the posterior superior iliac spine and the coccyx and 21G needle inserted at an angle of thirty degree to the skin into the sacral canal half way through its length. This is followed by aspiration of the needle to rule out blood or cerebrospinal fluid, 5 ml of normal saline is first introduced to establish free flow and then 15 ml of 1% lignocaine injected into the caudal space. The effectiveness of the caudal block was assessed after five to ten minutes using anal verge anesthesia and sphincter laxity. The patient is then put in left lateral position for transrectal biopsy. Prostate biopsies were taken by digital guidance using 16G spring loaded Tru cut needle. The guiding digit is protected by using the long needle cover as a guide to the points on the prostate gland before introducing the needle through it. At least eight tissue cores were taken. All patients had single prophylactic dose of intravenous ciprofloxacin during the procedure. Patients' vital signs were recorded before and monitored during the procedure. Procedure time was also recorded (from insertion of the guiding digit to end of tissue-core taking). The patients were observed for two hours before being discharged home on oral ciprofloxacin for five days. Analgesia during the transrectal biopsy was assessed using a Visual Analogue Scale VAS (0-10); where 0 and 10 represent no pain at all and worst pain respectively. Patients graded their

degree of satisfaction at the end of the procedure as follows; (0 = bad, 1 = good, 2 = excellent). The degree of motor block was assessed with the modified Bromage scale (0 = no motor block; 1 = unable to raise extended leg, able to move knee and foot; 2 = able to move foot only; 3 = complete motor block of lower limb). To avoid bias, caudal block was done by the same anesthetist while prostate biopsies were taken by the same urologist.

2.2 Ethical Issues

The study was approved by the Research and Ethics Committee of Ekiti State University Teaching Hospital.

2.3 Statistical Analysis

The data obtained was analysed using the SPSS statistical Windows Version 20.0 (SPSS Inc., Chicago).

3. RESULTS

Over a period of 2 years, 152 patients had prostate biopsy done. 140 patients had successful caudal block while 12 patients were excluded because the biopsy was done in conjunction with cystoscopy under spinal anesthesia or conscious sedation. More than half of the subjects 57.8% (81) were retirees, while civil servants, farmers, and skilled artisans constitute 18.6% (26), 12.9% (18) and 10.7% (15) of the subject population respectively.

The mean \pm SD (min-max) age of the subjects was 73.1 \pm 9.3 (45-95) years. The mean PSA level was 44.6 \pm 43.5 (0.4-249.0) ng/ml. The mean prostate volume was 95.3 \pm 30.1 (43.6-200.0) ml. The mean number of biopsies taken was 10.8 \pm (8-14) (Table 1).

The Bromage score was 0 in 130 patients (92.9%), 1 in 4 patients (2.9%) and 2 in 6 patients (4.3%). The mean biopsy duration was 12.1 \pm 2.5 (8-16) minutes. The mean pain score (VAS) during the procedure was 1.2 \pm 1.6 (0-5). There was no statistical significance between VAS and age ($P = 0.185$) or the number of biopsies taken ($P = 0.164$).

The patients' satisfaction scores were 1 and 2 in 21 patients (15%) and 119 patients (85%) respectively. No patient had satisfaction score of zero. About 86% (120) had no complication while rectal bleeding, haematuria, dizziness, vomiting and infection were complications seen

in 2.1% (3), 1.4% (2), 4.3% (6), 4.3% (6) and 2.1% (3) respectively. None of these required admission to the hospital ward (Table 2).

Table 1. Laboratory and clinical parameters among the subjects

Variables	Frequency (%)
Age in years (mean \pm SD)	73.1 \pm 9.3
Symptomatic LUTS ^a	125 (89.3)
Asymptomatic (screened)	15 (10.9)
Prostate volume (mean \pm SD)	95.3 (ml)
PSA ^b (mean \pm SD)	44.6 (ng/ml)
Histological characteristics	
CaP ^c	52 (37.1)
BPH ^d	84 (60)
HgPIN ^e	1 (0.7)
Chronic prostatitis	3 (2.1)

a= Lower urinary tract symptoms, b= Prostate specific antigen, c = Prostate cancer, d=Benign prostatic hyperplasia, e= High grade prostatic intraepithelial neoplasia

Table 2. Pain score (VAS) and frequency of complications

Pain score (VAS)	Frequency N (%)
0	74 (52.9)
1	17 (12.1)
2	20 (14.3)
3	13 (9.3)
4	4 (2.9)
5	12 (8.6)
Complications	
Dizziness	3 (2.1)
Hematuria	2 (1.4)
Dizziness	6 (4.3)
Vomiting	6 (4.3)
Infection	3 (2.1)

Prostatic adenocarcinoma, high grade prostatic intraepithelial neoplasia (PIN), benign prostatic hyperplasia (BPH) and chronic prostatitis were seen 37.1% (52), 0.7% (1), 60% (84) and 2.1% (3) respectively.

4. DISCUSSION

Prostate biopsy is indicated when cancer is suspected based on abnormal findings on Digital Rectal Examination (DRE), Lower Urinary Tract Symptoms (LUTS) and or elevated Prostate Specific Antigen (PSA) [6]. Increasing number of people are expected to need prostate biopsy following screening with DRE and or PSA and patients with previous benign outcome may need repeat biopsies [7,8]. Pain has been known to

influence the acceptability and adherence to a cancer screening programme [9]. Early diagnosis and treatment are crucial in the management of prostate cancer. Prostate biopsy done with an effective anesthetic technique will ensure patients' co-operation such that adequate biopsy samples are taken. This will increase diagnostic yield and reduce the rate of repeat biopsies. The qualities of an ideal anesthetic technique for prostate biopsy include: easy to perform on outpatient, quick onset of action, reversibility and minimal side effects [10]. However, there is no consensus in the literature regarding the best technique [11].

The early transrectal biopsies were done without active analgesia as the rectum was considered insensate [12]. Several pain control methods have been studied and compared with varying and, in some cases, conflicting results. These include inhalational general anesthesia, intravenous propofol, conscious sedation, pudendal nerve block, periprostatic infiltration and intrarectal lignocaine gel [13-17]. While inhalational and intravenous methods of anesthesia are time consuming and require a trained team in a theatre setting, the local anesthetic methods are appropriate for outpatient clinic setting.

The mean VAS in our study was 1.2 ± 1.6 SD, this is similar to 1.49 ± 1.93 SD found by Ikuerowo et al among 34 patients randomised to receive caudal block for tranrectal prostate biopsy [5]. However Sahin et al in a cross sectional study of 36 patients with anal rectal disorder undergoing transrectal prostate biopsy found a mean VAS of 2.1 ± 1.2 SD [18]. The higher VAS in their study may be the impact of anorectal problems in their cohorts' pain perception. Eighty-five per cent of our subjects reported excellent satisfaction with caudal block. This is lower than 100% excellent satisfaction found by Ikuerowo [5] but higher than 68% and 66.6% mean excellent satisfaction reported respectively by Cesur and Sahin [18,19]. The complications associated with caudal block in our studies are minor and transient. However, vomiting as a complication has not been reported. Although seen in only 4.3% of our patients, antiemetic or anticholinergic may be considered a part of premedication for caudal block.

5. CONCLUSION

Caudal block for digital guided transrectal prostate biopsy is effective and well tolerated irrespective of age and number of biopsy

samples taken. Antiemetic premedication may be considered to prevent vomiting encountered in some patients.

6. LIMITATIONS

The cross sectional nature of the study without matched controls and the limited sample size make it difficult to generalise the results obtained. Our data analysis was restricted to providing a descriptive snapshot of pain scores and degree of satisfaction among the subjects. A randomised controlled trial comparing caudal block with other options of anesthesia for prostate biopsy in our environment will be desirable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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