



# Lidocaine Gel for Transrectal Prostate Biopsy

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## Abstract

**Introduction:** Cancer of the prostate (CaP) is the most common cancer among black men. The incidence of prostate cancer is rising in Africa. Prostate biopsy is the standard procedure for the diagnosis of CaP. The prostate biopsy is an invasive procedure and is associated with pain. This can be emotionally and psychologically traumatic for the patient. Intrarectal gel administration is relatively non-invasive, easy to administer, cheap and has an acceptable time of onset of action. **Methods:** This is a prospective study to determine the analgesic effect of intrarectal lidocaine gel for digitally guided transrectal prostate biopsy. The study was carried out at the University of Port Harcourt Teaching Hospital. Ethical approval was sought and obtained from the hospital's ethical committee. This is a tertiary institution in Port Harcourt the capital of Rivers State in southern Nigeria. The sample size was calculated to be 159. The patients then filled in the Visual Analogue Scale score (VAS) 5 minutes after the prostate biopsy. **Results:** The mean age of patients was 66.19 ± 8.1. The mean prostate volume was 72.74 ± 52.17. The mean VAS was 3.63 ± 2.38 and over half 28(52.8%) of those in this group had mild pain while 17(32.1%) and 8(15.1%) had moderate and severe pain respectively. **Conclusion:** Lidocaine gel is a good option for analgesia during prostate biopsy. The analgesic effect of lidocaine gel for prostate biopsy is better when the contact time should be 30 minutes or more.

**Keywords:** Prostate cancer, lidocaine gel, analgesia, visual analogue score, prostate biopsy

## Introduction

Cancer of the prostate (CaP) is the most common cancer among men [1,2]. Prostate cancer is a global health challenge. The incidence of CaP is higher in black Americans than in Asians. The incidence of prostate cancer is rising in Africa [3]. This has been attributed to improved awareness and increased life expectancy [3]. It is the second leading cause of cancer-related deaths in men worldwide [1,3]. Prostate biopsy is the standard procedure for the diagnosis of CaP [3,4]. The prostate biopsy is an invasive procedure and is associated with pain. This can be emotionally and psychologically traumatic for the patient [5,6]. Lidocaine injection is a local anaesthetic agent which can be used for prostate biopsy. Lidocaine gel can also be used for analgesia during a prostate biopsy. Lidocaine gel is readily available [7]. Intrarectal gel administration is relatively non-invasive, easy to administer, cheap and has an acceptable time of onset of action [1]. Lidocaine acts by reversibly blocking sodium channels, thereby preventing the depolarization of excitable tissue. Pain nerve fibres that are blocked, are both thick (Aδ fibres for sharp pain) and thin (C fibres for dull pain), myelinated (Aδ) and unmyelinated (C fibres). The onset of action is rapid (1-5 minutes) and has a half-life of 73-133 minutes, rectal absorption time is 30-60 minutes [8,9]. Lidocaine is dealkylated in the liver by cytochrome P450 into a couple of metabolites [10]. These include Monoethylglycine xylidide and glycine xylidide, these are key active metabolites, both have reduced potency but have a similar pharmacologic activity to lignocaine [10].

Ibiok I. A. *et al.* [11] in Uyo, Nigeria compared the use of lidocaine gel and placebo for TRUS-guided prostate biopsy in one hundred and fifty-three (153) men. They found a significant difference in pain perception. Respondents who received a placebo felt more pain than those who got lidocaine.

## Methods

This was a prospective study to determine the analgesic effect of intrarectal lidocaine gel for digitally guided transrectal prostate biopsy. The study was carried out at the University of Port Harcourt Teaching Hospital. This is a tertiary institution in Port Harcourt, the capital of Rivers State in southern Nigeria. There are two teaching hospitals in this city, both hospitals carry out an average of 200 prostate biopsies annually. The sample size was calculated to be 159.

Those included in this study were patients with a history and examination findings suggestive of CaP, elevated prostate-specific antigen and transrectal ultrasound scan suspicious of prostate cancer. Those excluded were patients with uncontrolled bleeding disorders, neurologic disorders, patients who had a previous prostate biopsy, and those with psychiatric disorders.

All patients were interviewed by the researcher. Patients who met the inclusion criteria were counselled and informed consent was obtained. Patients were given oral ciprofloxacin 500mg twice daily, oral metronidazole 400mg three times daily 2 days before the biopsy and tablet bisacodyl 10mg a day before the procedure. Patients who were on antiplatelets stopped the antiplatelets 10 days before the prostate biopsy.

The patients were placed in the left lateral position, and then 10mls of 2% lidocaine gel was instilled into the rectum with the aid of an introducer. The gloved index finger of the dominant hand of the researcher was used to rub the gel onto the prostate. Thirty minutes was allowed for the anaesthesia to take effect before the procedure was carried out. Eighteen (18) gauge, twenty-five centimetres (25cm) long, Tru-cut biopsy needle was used to collect twelve cores of prostate tissue from each patient. The patients then filled in the Visual Analogue Scale score (VAS) 5 minutes after the prostate biopsy.

## Results

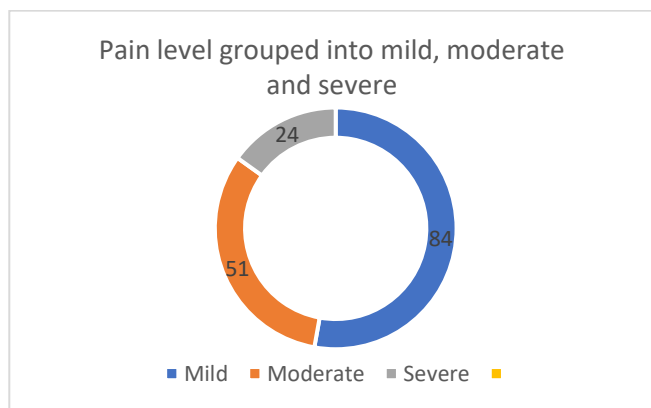
The results of the study are presented below.

**Table 1: Age distribution of respondents**

Age (yr)	
N	159
Mean	66.19
Median	67.00
Std. Deviation	8.16
Range	34.00
Minimum	48.00
Maximum	72.00

**Table 2: Means of prostate volume, bladder thickness and PSA.**

	Mean ± SD
Prostate size	72.74 ± 52.17
Bladder thickness	1.85 ± 6.30
PSA	69.60 ± 52.34



**Figure 1: Pie chart showing grading of pain score into mild, moderate and severe**

**Table 3: Table showing mean VAS scores during prostate biopsy**

	Mean ± SD
Vas Finger	2.00±2.03
Vas Needle	3.63±2.38

## Discussion

Prostate cancer is a global problem, it is the most common cancer among Nigerian men [1]. The incidence of prostate cancer is on the increase and an important reason for presentation to hospitals in Nigeria and Africa [1,11,12]. Prostate biopsy is associated with significant pain, and the ideal method of analgesia has been the subject of debate [3,13,14].

The mean age of patients in this study was 66.19 ± 8.16 as seen in table 1.1, this is similar to the mean age of a study done by Obi *et al.*[15] (mean age 63.3 ± 8.96) and Raphael *et al.*[16] (68.39 ± 10.06), the similarity in mean ages of patients in these studies may be because they were all done in the same geographical region. This may also imply that the respondents were exposed to similar aetiological factors.

The mean prostate volume of patients in this study was 72.74±52.17 this is similar to a study by Udo *et al.* where the average prostate volume was 69.8 ± 63.5 cm<sup>3</sup>.

The mean PSA in this study was 69.60±52.34 Fink *et al.*[9] in their study noticed that the longer the duration of intrarectal lidocaine the less the pain and vice versa. Bill *et al.*[8] stated that lidocaine was absorbed from the rectal after 30 to 60 minutes. In some studies, the high VAS score recorded with intrarectal lidocaine may have been lower if the interval between the instillation of the intrarectal gel and the commencement of prostate biopsy was

adequate. In this study, the mean VAS was 3.63±2.38 and over half 28(52.8%) of those in this group had mild pain while 17(32.1%) and 8(15.1%) had moderate and severe pain respectively. Izol *et al.*[17] their study used lidocaine gel for one of the study groups with a mean VAS of 2.92±1.17 which is similar to what was obtained in this study.

In a study by Imani *et al.*[18] the mean VAS score for those who had lidocaine gel during transrectal prostate biopsy was 5.1±2.1 and this was statistically significant (p=0.001) when compared with the other groups that had lidocaine with diltiazem (VAS 3.5±23) and lidocaine, diltiazem with meperidine (2.5±2.2). The VAS score obtained during the insertion of the probe in all the groups was also statistically significant, they, however, did not state the time interval between inserting the analgesic agents and the commencement of prostate biopsy, in addition, diltiazem is not an analgesic agent so the reduction in the VAS score in that group may have been due to relaxation of the sphincter and the study did not state if there was statistical significance between the groups that had diltiazem and diltiazem with meperidine added to lidocaine.

Ibiok *et al.*[1] in Uyo, Nigeria found that there was a significant difference between the use of placebo and intrarectal lidocaine gel for transrectal prostate biopsy. 78.2% of the patients gave consent for a possible repeat biopsy using lidocaine gel. This showed that lidocaine gel provided better analgesia when compared to a placebo. This is similar to this study in which over half of the patients who had intrarectal lidocaine gel felt only mild pain during prostate biopsy.

## Conclusion

Lidocaine gel is readily available. Its administration is not traumatic to the patient and does not require special training. Lidocaine gel is a good option for analgesia during prostate biopsy. The analgesic effect of lidocaine gel for prostate biopsy is better when the contact time should be 30 minutes or more.

## List of abbreviations

PSA: Prostate specific antigen  
 CaP: Cancer of the prostate  
 VAS: Visual Analogue Scale score  
 Et al: et alia

## Ethics

Ethical approval was obtained from the ethical committee of the University of Port Harcourt Teaching Hospital. All patients recruited for this study gave written consent before their data was collected.

## Conflict of Interest

None declared

## Funding Statement

Funding for the research was not required because patients paid for the procedure as they usually do and the materials used for the study were provided by the institution.

## Authors' contributions

OD conceptualised the study, drew up the framework, collected and analysed the data and did some of the prostate biopsies.

VA did some of the procedures and was also involved the writing the manuscript.

TD did the literature search and was involved in writing the manuscript. All authors read through and approved the final manuscript.

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