Original Article

Periprostatic Lidocaine Infiltration Versus Transrectal Lidocaine Gel For Local Anaesthesia In Transrectal Ultrasound Guided Prostate Biopsy

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Abstract

Management of pain plays an important role during prostate biopsy. Various types of management of pain plays an important role during prostate biopsy. Various types of anaesthetic methods have been used. The present study aimed to compare the efficacy and complication rate between periprostatic lidocaine infiltration and transrectal lidocaine gel in transrectal ultrasound guided prostate biopsy. All prostate biopsy patients were included except those with lidocaine, allergy, haemorrhagic diathesis, anticoagulation therapy, the inability to rate a visual analogue scale and inability to obtain consent. They were randomized into two groups. Group 1 received 20ml 2% transrectal lidocaine gel. Group 2 received 5ml 1% lidocaine infiltration for each periprostatic nerve block with 23-gauge spinal needle. After three minutes, prostate biopsy was performed with an 18 gauge 7-inch spring-loaded biopsy gun. Six biopsies were taken for each lobe. Pain during probe insertion, biopsy and immediately after the procedure was assessed using the Visual Analogue Scale. Any complication immediately after procedure, one day or after one week, was recorded. Mean pain score was lower after periprostatic lidocaine infiltration compared to transrectal lidocaine gel (3.1 ± 1.9 versus 4.9 ± 2.4, $p = 0.027$). There was no statistically significant difference in the complication rate. Transrectal ultrasound prostate biopsy using periprostatic lidocaine infiltration provides better anaesthesia as compared to the transrectal lidocaine gel application with no significant difference in complication. Thus, the use of periprostatic lidocaine infiltration in TRUS guided prostate biopsy is recommended.

Key Words: Analgesia, biopsy, complication, pain, prostate.

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Introduction

Prostate cancer is the most frequently diagnosed cancer in males and the second leading cause of death. In Malaysia, the reported cases of prostate cancer in 2002 were 458 with 375 mortalities. In 2003 itself, prostate cancer was the sixth most frequent cancer among the male population in Peninsular Malaysia. It accounts for 6.4% of male cancers that year (1).

Transrectal ultrasound (TRUS) guided biopsy of the prostate is the standard investigation for detecting prostate cancer. The invention of ultrasound has led to the development of TRUS in which needle biopsy can be guided by ultrasound. It uses a special device (transducer) to produce images of the prostate. These real time images help to guide the biopsy needle to obtain prostate tissue samples (2).

There are various ways in administering analgesia in TRUS biopsy such as oral tramadol, transrectal lidocaine gel, periprostatic lidocaine infiltration and intramuscular pethidine. Researchers have reported that transrectal lidocaine gel is a simple, safe and effective method of anaesthesia delivery before transrectal ultrasound guided prostate biopsy (3). Periprostatic lidocaine infiltration was first used for transrectal ultrasound-guided biopsy of the prostate by Nash *et al*. in 1996 (4).

Therefore, this prospective, randomized-controlled study was performed to compare the efficacy of transrectal lidocaine gel application with periprostatic lidocaine infiltration in reducing pain in TRUS – guided prostate biopsy besides assessing their complication rates.

Materials and methods

This was a randomized-controlled prospective study. Approval for this study was obtained from the Ethics Committee of the institution. All patients who underwent TRUS guided prostate biopsy were included in our study. Indications for biopsy included abnormal digital rectal examination and elevated prostate specific antigen (PSA) level The PSA cut-off value was 4 ng/ml. Exclusion criteria were lidocaine allergy, haemorrhagic diathesis, anticoagulation therapy, the inability to rate a visual analogue scale (VAS) and inability to obtain consent.

The patients received ravin enema and 500mg ciprofloxacin the morning prior to the procedure. After informed consent was obtained, patients were randomized via into two groups. Patients were placed in the left lateral position. Group 1 patients received 20ml 2% transrectal lidocaine gel three minutes before biopsy. Group 2 patients received 5ml 1% lidocaine periprostatic nerve block using 23-gauge spinal needle three minutes before biopsy. The biopsy was performed in an outpatient setting. The transrectal probe used was the standard 7MHz endocavity biplanar probe. After three minutes, prostate biopsy was performed with an 18-gauge 7-inch spring-loaded biopsy gun. Six biopsies were taken for each lobe and giving a total of twelve core biopsies for each prostate. The length of each core was set at 15mm. The procedure was carried out by one designated urology consultant for this study.

Statistical analysis

The differences in VAS pain scores between the two groups were analyzed by Mann-Whitney U test. Fisher test was used for comparing the complications between the two groups.

Results

A total of 29 male patients were enrolled for the study. Fourteen were randomised to transrectal lignocaine gel and the other fifteen to periprostatic lidocaine infiltration for anaesthesia. There was a significant difference in the mean pain score (VASmod) after transrectal lidocaine gel and periprostatic lidocaine infiltration (4.9 ± 2.4 versus 3.1 ± 1.9, $p = 0.027$) with patients receiving periprostatic lidocaine infiltration reporting significantly less pain. There was no statistically significant difference in the complication rate (Table 1).

Discussion

TRUS guided prostate biopsy has become an important diagnostic tool in the evaluation of patients suspected of having prostate cancer. Pain associated with prostate biopsy occurs predominantly when the needle penetrates the prostate capsule into the stroma.

Table 1: Complication rates after TRUS biopsy

	Transrectal lidocaine gel	Periprostatic lidocaine infiltration	p
Haematuria	45.7%	35.7%	0.65
Haematochezia	35.7%	26.7%	0.70
Dysuria	21.4%	26.7%	1.00
Fever	21.4%	6.7%	0.33
Chills	14.3%	13.3%	1.00
Rigor	7.1%	6.7%	1.00
Urinary incontinence	14.3%	6.7%	0.60
Urinary retention	21.4%	13.3%	0.65
Haematospermia	7.1%	0.0%	0.48

Maintenance and positioning of the ultrasound probe can also contribute to the discomfort (6). Thus prostate biopsy in the absence of anaesthesia is painful and therefore local anaesthesia should be offered to any male undergoing TRUS-guided prostate biopsy.

The prostate gland receives both sympathetic and parasympathetic nerve supply to both stroma and glandular element. Nerve joins the neurovascular bundles, which pass along the posterolateral margins of the gland between the capsule and Denonvillier's fascia. Introduction of lidocaine infiltration at these points will numb the entire gland since it dissects and spreads along the plane of Denonvillier's fascia. Waiting for three minutes before performing the biopsy will enhance pain control (7).

Lidocaine gel decreases pain and discomfort during probe insertion and rectal wall puncture by exerting local effect on the autonomic innervation of the rectal mucosa but has no influence on pain when the needle penetrates the prostate capsule. It is a simple, safe and effective method of anaesthesia (3).

There have been conflicting repo 43 comparing these 2 methods for local anaesthesia during TRUS-guided prostate biopsy. Researchers have also found that periprostatic lidocaine infiltration was more effective than intrarectal lidocaine gel application (8). In contrast, other researchers concluded that there was no difference regarding pain between periprostatic lidocaine infiltration and transrectal lidocaine gel (9). In the same study, they waited for ten minutes after transrectal lidocaine gel application before performing the biopsy. This could be the reason for the different outcome as compared to our study.

In terms of complications of TRUS biopsy, there was a higher rate of haematuria, haematochezia, fever, chills, urinary retention, urinary incontinence and haematospermia in the lidocaine gel group. However, these differences were not statistically significant. Our results were in agreement with earlier research reports (8,9). The higher rate of complications in the lidocaine gel group, though not significant, could be due to the difficulty in executing the biopsy in a patient who is uncooperative due to the pain. Interestingly, another group of researchers showed that transrectal ultrasound-guided prostatic biopsy performed without anaesthesia is a method well tolerated by most of his patients (10). In this study, only the first core location influenced pain and he recommended starting a biopsy at the base of the prostate.

Conclusion

In conclusion, this prospective randomized controlled study showed that transrectal ultrasound prostate biopsy using periprostatic lidocaine infiltration provides better anaesthesia as compared to the transrectal lidocaine gel application with no significant difference in complication. Thus, the use of periprostatic lidocaine infiltration in TRUS guided prostate biopsy is recommended for future clinical practice.

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