Assessment of associated pain and complications in TRUS guided prostate biopsy in patients with and without local anesthesia

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Abstract

Objective: To assess the safety, efficacy and complications of peri prostatic lignocain injection in trans rectal ultrasound (TRUS) guided biopsy of the prostate gland.

Material and method: One hundred and ten male patients were selected for TRUS guided prostate biopsy. They were randomizely divided in to two equal groups i.e. 55 in group 1 and 55 in group 2. In group 1 local anesthesia (LA), 1% lignocain was injected in the peri-prostatic area and in group 2 the procedure was performed without local anesthesia. Eight to ten biopsy cores while in majority ten cores were taken. All the patients were asked to fill in the expected pain score on visual analogue (VAS) scale prior to the procedure. They also completed the actual pain score (VAS) experienced after the procedure. Complications occurred during the producer were recorded.

Results: The age, mean PSA (prostate specific antigen) level were comparable in both groups. The expected pain score was also comparable in both groups 5.20±1.4 in group 1 and 5.0±1.5 in group 2. In group 1 the mean actual pain score was 3.20±1.6 and group 2 5.80±2.24. The complication rate was not significantly different in both groups.

Conclusion: Periprostatic LA injection is safe, effective and should be routinely recommended to all patients undergoing TRUS biopsy of the prostate gland.

Keywords: Prostate cancer, TRUS biopsy, local anesthesia

Introduction:

Prostate cancer is the second most common cause of death from cancer in men and is slightly exceeding than bronchogenic carcinoma. PSA (prostate specific antigen) is a very sensitive tumour marker and can be used for the early diagnosis of the prostatic tumour. Diagnosis of Prostate cancer has been revolutionized by the use of PSA and trans rectal ultrasound (TRUS) guided biopsy. It is important to remember that PSA is prostate specific and not prostate cancer specific. Over the past decade, one of the most significant developments is the ability to induce local anesthesia in patients undergoing TRUS. Takahashi and Ouchi, first introduced TRUS of the prostate in 1963. This procedure is routinely performed without anaesthesia in urological out door patients. In 1996 Nash et al described the use of LA for prostate biopsy via a peri prostatic block. While tolerated by many patients, it is associated with significant pain in some patients. Hodge et al, (1989) performed the first systematic sextant biopsy of the prostate.

Recently, great interest arises to adopt various methods for providing analgesia during this procedure. This procedure is performed routinely for more than a decade with out any anaesthesia, and is associated with significant discomfort. Irani et al, (1997) observed that 6% of their patients opted for general anaesthesia and 19% would not undergo repeat biopsy without some form of anaesthesia. This is similar to the observation of Collin et al (1993) and Clements et al, (1993) where 22% and 30% of patients ex-
The diagnosis of prostate cancer is further enhanced by additional biopsies.\textsuperscript{3,6} The amount of discomfort generally increases with increasing core numbers and repeated biopsies, particularly among younger patients.\textsuperscript{8} In this randomized prospective study, we assess the safety and efficacy of peri prostatic local anaesthesia in TRUS guided biopsy of the prostate.

**Materials and methods:**
This prospective study was conducted in Department of Surgery, Saidu Teaching Hospital Swat from May 2007 to December 2008. One hundred and ten male patients were selected for TRUS guided prostate biopsy. These male patients were selected for biopsy either by abnormal DRE (digital rectal examination), or elevated PSA or abnormal finding on TRUS and were randomly divided into two equal groups i.e. 55 men in each group. In group 1 the procedure were performed under local anaesthesia and in group 2 this was done without anaesthesia. Patients with painful anal condition were excluded and those on oral anticoagulant, the drug was discontinued 48 hours prior to biopsy Written consent were taken from all patients after counseling. Kleen enema was administered 30-45 minutes before the procedure. Intravenous 120 mg of gentamycin was given to all the patients before the procedure and tablets metronidazole (Flagyl) 400 mg and ciprofl oxacin 500mg twice daily for three days was given after the procedure. Patients were positioned in left lateral position and DRE was first performed. TRUS of the prostate was done with 7.5 MHz multi planer probe. 65 to 70 % of hypo echoic lesions in the prostate are malignant and conversely, only two- thirds of prostate lesion is hypo echoic, after assessing the prostate size, echo pattern and architetecture. A 15 cm long, 22 G spinal needle was passed through the biopsy channel of the TRUS probe and the tip of the needle was positioned accurately with ultra sound guidance in the angle between the base of the prostate and seminal vesicles. 2.5 ml of 1 % lignocaine was injected. The needle was withdrawn and repositioned in the apex of the prostate and further 2.5 ml of local anaesthesia (LA) was injected. The same procedure was repeated on the other side. Sextant prostate biopsies (including two biopsies from the base, midzone and apices of either side) have the gold standard analysis which identifies up to 80% of clinically unsuspected cancers. Taking additional laterally directed biopsies from the peripheral zone in the base and mid sector have also shown increase incidence of cancer detection rate.

We performed the TRUS guided biopsy with 18 G trucut needle 1-2 minutes of LA injection. 8-12 core biopsies were obtained; in majority of cases 10 core biopsies were taken. Our biopsy protocol included routine sextant biopsies and further two laterally directed peripheral zone biopsies on either side. Additional cores were taken as necessary by echo pattern of the prostate.

Patients filled the pain score experienced; on visual analogue scale (VAS) prior to have the biopsy (expectant pain score) .This was to assess the element of anxiety indirectly. They also complete the pain score after the procedure. (Actual pain score). We thus classified pain as mild (1-3), moderate (4-6) and severe, if pain was scored greater than 6 on the VAS. Patients were monitored routinely by the operation theatre staff and urine of all patients was tested routinely for haemituria.

**Results:**
This was a prospective study and one hundred and ten men were selected. They were randomly divided into two equal group i.e group 1 and group 2 (55 men in each group). The group 1 men received LA, while in group 2 the procedure was performed without anesthesia. The two groups were well matched with regard to age and PSA level. (Table 1).

The mean expected pain score was 5.20 ±1.4 in group 1 and 5.00±1.5 in group 2, comparable in the two groups. The mean actual pain score was 3.20±1.6 in group 1 and 5.80±2.24 in group 2. Significant prostate biopsy complications were observed which include pain, per rectal bleed-
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Table 1: PSA level, pain score in the LA and without LA group

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group 1 with LA.</th>
<th>Group 2 without LA</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td>64.5 ± 6.2</td>
<td>64.8 ± 6.6</td>
</tr>
<tr>
<td>PSA level</td>
<td>11.7±6.2</td>
<td>12.4±7.4*</td>
</tr>
<tr>
<td>Expectant pain score</td>
<td>5.20±1.4*</td>
<td>5.0± 1.5</td>
</tr>
<tr>
<td><strong>Actual pain score</strong></td>
<td><strong>3.20± 1.6</strong></td>
<td><strong>5.80± 2.48</strong>**</td>
</tr>
</tbody>
</table>

Value are given mean±SED P*≤, **P≤0.01

Table 2: Complication Rates of TRUS biopsy in Group 1 and Group 2

<table>
<thead>
<tr>
<th>Findings</th>
<th>Group 1 with LA</th>
<th>Group 2 without LA</th>
</tr>
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<tbody>
<tr>
<td>Haematuria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2 days</td>
<td>4 (7.27%)</td>
<td>6 (10.90%)**</td>
</tr>
<tr>
<td>&gt;2 days</td>
<td>1 (1.8%)</td>
<td>2 (3.63%)**</td>
</tr>
<tr>
<td>Bleeding per rectum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2 days</td>
<td>4 (7.27%)</td>
<td>4 (7.27%)</td>
</tr>
<tr>
<td>&gt; 2 days</td>
<td>1 (1.8%)*</td>
<td>0</td>
</tr>
<tr>
<td>Haemospermia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10 days</td>
<td>10 (18.18%)</td>
<td>8 (14.54%)</td>
</tr>
<tr>
<td>&gt;10 days</td>
<td>2 (3.63%)</td>
<td>1 (1.8%)</td>
</tr>
<tr>
<td>Infection</td>
<td>6 (10.90%)</td>
<td>7 (12.72%)*</td>
</tr>
<tr>
<td>Infection - hospital admission</td>
<td>1 (1.8%)*</td>
<td>0</td>
</tr>
<tr>
<td>Acute urinary infection</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

-Value are given, P* ≤, 0.005** P≤).01

Discussion:

Detection of Prostate cancer by prostate biopsy is a painful and invasive procedure. 60-90% of patients report discomfort or pain when undergoing a prostate biopsy, which may be mild or severe and even cause vasovagal reaction.

Cadaveric studies have shown that the neuro anatomical pathway for sensation originates from the inferior hypogastric plexus and travel along the tip of the seminal vesicle between prostate and rectum on the posterolateral aspect of the prostate. The nerves fibers are seen in the form of plexus outside the capsule, before it penetrate it. Pain during TRUS biopsy has two component, pain caused by probe passage and due to insertion of the biopsy needle. The most pain sensitive structure is the prostatic capsule. Initially biopsies involved taking a limited number of cores from a nodule, but Hodge et al changes that approach in 1989, with the sextant biopsy technique, which soon become the standard for most urologist. Over the past decade, one of the most significant developments has been the ability to provide local anesthesia to patients undergoing this procedure. Various methods like periprostatic LA, intra rectal LA, entonox inhalation have been tried during TRUS biopsy.

In 1996, Nash et al described the use of local anesthesia for prostate biopsy via a periprostatic block. However, until Soloway and Obek published a corroborating study in 2000, few urologist opted to change their prostate biopsy procedure.

We performed a randomized, prospective study to asses the efficacy and safety of periprostatic induction of local anaesthetic, 1% lignocain and in particular the complication rate associated with the procedure. Significant lower mean actual pain score was observed in the local anesthetic groups, compared with the non local anesthetic group, shows a clear advantage of local anesthetic.

This is not explained by the difference in the level of anxiety, as the expected pain score was comparable in both groups. The expected pain score is taken as an indirect measure of the level
of anxiety as anxious patients tend to tolerate the procedure poorly and careful pre procedure counseling improves tolerability.6,8 In January 2001, only 11% of urologists performed this procedure with local anesthesia and concerned about reducing the pain associated by blockade of the peri prostatic nerves with local anesthetic.15 Fortunately there has been increasing interest in reducing patient discomfort in recent years. In our study we compared the safety and efficacy of the local anesthesia and complications in TRUS guided prostate biopsy. The increase in the number of biopsy cores taken makes it necessary to use an anesthetic technique to improve tolerability of the procedure.

In our study use of local anesthesia in the neurovascular bundle has clearly allowed us to increase the number of cores obtained and reduces the pain associated with this procedure. We therefore agree with the majority of authors who defend the use of periprostatic nerve block with local anesthesia. Some authors state that addition of an intra rectal lidocain gel reduces the discomfort caused by injection of local anesthetic in to the neurovascular bundle.16 In our study the discomfort caused by injection of local anesthetic plus LA injection. Concern was being raised about reducing the pain associated by blockade of the peri prostatic nerves with local anesthesia.15 Fortunately there has been increasing interest in reducing patient discomfort in recent years. In our study we compared the safety and efficacy of the local anesthesia and complications in TRUS guided prostate biopsy. The increase in the number of biopsy cores taken makes it necessary to use an anesthetic technique to improve tolerability of the procedure.

The onset of action of LA depends on the surface area of the nerve fibers and the larger the surface area of the nerve fiber, faster will be the onset of action. This explains the fast onset of the LA effect in our study. In this study we also noted that both groups reported pain on probe insertion. Tobias Machado compared two patients groups and their conclusion was significant because they found that 100% of the anesthetized patient would accept a new biopsy, while 55% of the group without anesthesia would refuse it.17 100% of group 1 patients in our study said yes for repeat biopsy, while in group 2, 47% opted for repeat biopsy. It has also been published that use of intra rectal enema with 1% lidocain is as effective as periprostatic injection of 1% lidocain for pain control.19 The complication rates are comparable in both groups (Table 2). In this study we found no adverse reaction or technical difficulty encountered during the LA injection. Concern was being raised about the possibility of septicemia in previous studies as LA drug is injected through a potentially contaminated area.20,21 It has been noted that pre procedure anxiety, increasing number of biopsies, repeat biopsy and young age (<60 years) have adverse effect on the tolerance of the TRUS biopsy,6 certainly this group of patients would benefit from receiving LA. Although we can see that numerous technique are used to reduce or abolish pain, none has been shown to be better than periprostatic nerve blockade with LA.22 Our study is comparable with this.

Conclusion:
We concluded that the peri-prostatic block with 1% lignocain was a very effective and useful technique, easy to administer, almost completely abolishes the pain and discomfort associated with TRUS guided prostate biopsy procedure. This should be routinely offered to all patients undergoing TRUS biopsy of the prostate and it allows a greater number of cores to be obtained.

References:
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