

Michael Müntener · Markus Fatzer · Valentin Praz
Urs Straumann · Rätö T. Strebel · Hubert John

Local anesthesia for transurethral manipulations: is a transrectal periprostatic nerve block effective?

Received: 26 January 2005 / Accepted: 18 September 2005 / Published online: 28 October 2005
© Springer-Verlag 2005

Abstract Periprostatic nerve block has been reported to be an effective form of anesthesia for prostatic surgery. Recent studies have shown the simplicity and the efficacy of a transrectal approach for periprostatic nerve block. The goal of our study was to evaluate the effect of a transrectal periprostatic nerve block on the discomfort associated with rigid cystoscopy. A total of 73 patients underwent cystoscopy. Group 1 ($n=39$) received a transrectal periprostatic lidocaine infiltration prior to the cystoscopy. Group 2 ($n=34$) underwent cystoscopy alone. The pain that patients experienced during cystoscopy was assessed on a visual analog scale. The patients in the two groups were very similar in regard to age and size of the prostate. The mean pain score was 3.4 in group 1 and 3.9 in group 2. This difference was not statistically significant. We conclude that nerve block does not seem to reduce the pain associated with transurethral manipulations.

Keywords Anesthesia · Local · Nerve block · Prostate · Cystoscopy

Introduction

Transurethral manipulations are routine procedures in daily urological practice. Diagnostic procedures like cystoscopies or retrograde ureteropyelographies are often performed under local anesthesia, which is achieved by urethral instillation of lidocaine gel prior to the instrumentation.

Many of these procedures, especially if they have to be performed with a rigid instrument cause substantial discomfort to the patient and often they have to be performed under general or regional anesthesia. The passage of the rigid cystoscope through the external urethral sphincter and manipulation with the instrument in the prostatic urethra are the most painful parts of these investigations. Therefore, a simple and effective local anesthesia that significantly reduced the pain associated with transurethral instrumentation would be a desirable tool for urologists, especially in patients who are a poor anesthesiological risk.

Neuroanatomic studies of the prostate have demonstrated that the main nerve supply of the gland originates from the pelvic plexus located at the tip of the seminal vesicles. From there the nerves pass along the dorsolateral aspect of the prostate [11, 12, 16]. Based on this knowledge, transurethral, transperineal, transrectal, and retropubic approaches have been described to anesthetize these nerves prior to diagnostic or therapeutic prostatic procedures and mostly positive experiences have been published [4–8, 10, 14, 17].

Recently, many studies have shown the simplicity, the safety, and the efficacy of a transrectal periprostatic lidocaine infiltration, as anesthesia during needle biopsy of the prostate and today many urologists consider it as a standard procedure [1, 2, 9, 13, 15]. These studies have as well made clear that also in moderately painful procedures like a prostate biopsy, patients can benefit substantially from a local analgesia, which is safe and easy to administer.

M. Müntener · M. Fatzer · R. T. Strebel · H. John
Department of Urology, University Hospital,
Zürich, Switzerland

V. Praz
Department of Urology, University Hospital,
Lausanne, Switzerland

U. Straumann
Department of Urology, University Hospital,
Basel, Switzerland

M. Müntener (✉)
Department of Urology, The Johns Hopkins Medical Institutions,
Baltimore, MD, USA
E-mail: muntener@jhmi.edu

We hypothesized that a periprostatic nerve block also reduces the discomfort associated with a simple transurethral manipulation like a cystoscopy. Hence the goal of our study was to evaluate the effect of a transrectal periprostatic lidocaine infiltration on the degree of pain associated with a routine rigid cystoscopy.

Patients and methods

A total of 73 patients with a mean age of 62 (range 40–78) years gave informed consent and were prospectively enrolled in this study. None of the patients had a history of prostatic or urethral surgery. Group 1 consisted of 39 patients who were scheduled for transrectal biopsy of the prostate and therefore received a periprostatic local anesthesia. The 34 patients in group 2 were scheduled for a routine cystoscopy and served as control.

In group 1, periprostatic anesthesia was administered with the patient in a dorsal lithotomy position. Under transrectal sonographic control, with the prostate in a transverse plane, a total of 10 ml 1% lidocaine was injected between the periprostatic fascia and Denonvilliers' fascia at the dorsolateral aspect of the prostate on both sides from the base to the apex. The injection was administered under direct vision with a 7 in. 22-gauge spinal needle that was advanced through the working cannula of the ultrasound probe. The spreading of lidocaine solution could be observed along the course of the neurovascular bundles (see Fig. 1). Cystoscopy was performed 10 min after the administration of the periprostatic local anesthesia.

The patients in group 2 underwent cystoscopy without periprostatic anesthesia. In both groups, 10 ml of lidocaine gel was applied transurethraly 5 min prior to the cystoscopy. A 17 Fr rigid cystoscope was used for the cystoscopies and all procedures were performed by experienced senior residents. No additional sedation or analgesia was used in any of the patients. As a measure of prostate size the length of the prostatic urethra was noted. The pain that patients experienced during cystoscopy was assessed immediately after the examination using an 11 point (0–10) visual analog scale, where 0, 1–3, 4–6, and 7–10 stood for nil, mild, moderate, and severe discomfort, respectively. Characteristics and results

of the two groups were statistically analyzed using the nonparametric Mann–Whitney *U*-test and $P < 0.05$ was accepted as level of significance.

Results

Mean patient age was 62 years in both groups with a range of 53–73 years in group 1 and a range of 40–78 years in group 2. The mean length of the prostatic urethra was 28 mm (range 20–50 mm) in group 1 and 25 mm (range 15–40 mm) in group 2. This difference was not statistically significant ($P = 0.1$).

The discomfort experienced during cystoscopy was rated mild, moderate and severe in 19, 17, and 2 patients in group 1 and in 8, 24, and 2 patients in group 2, respectively. One patient in group 1 stated that the cystoscopy caused him no discomfort.

The mean pain score was 3.4 (range 0–8) in group 1 and 3.9 (range 1–7) in group 2 (see Fig. 2). This difference was not statistically significant ($P = 0.12$).

No complication related to any procedure occurred in either group.

Discussion

Diagnostic transurethral procedures can cause considerable discomfort especially in male patients. As routine procedures, they are often performed in an office setting under local anesthesia, which is achieved by transurethral application of lidocaine gel some minutes prior to the manipulation. A safe, simple and effective way to optimize analgesia during transurethral procedures in men would therefore be very welcome.

There are several ways to anesthetize the nerve supply of the prostate and most of them have been reported to be an effective analgesia during transurethral operations.

In 1977, Moffat reported standard transurethral resections under local anesthesia in 18 patients. The local anesthesia was achieved by transperineal periprostatic lidocaine infiltration in addition to a topical lidocaine instillation into the urethra [8]. Leach et al. [7] performed visual laser-assisted prostatectomies using the same form of local anesthesia. Recently, Issa et al.

Fig. 1 Transrectal sonographic appearance (transverse plane) of the base of the prostate before (left) and after (right) periprostatic lidocaine infiltration

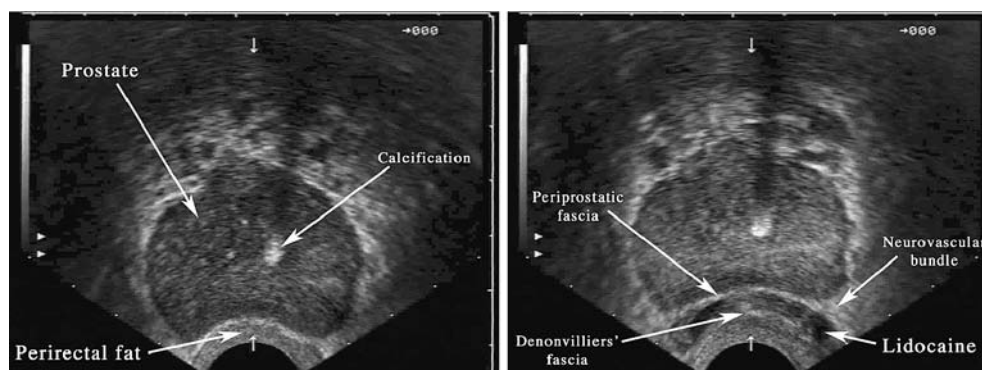
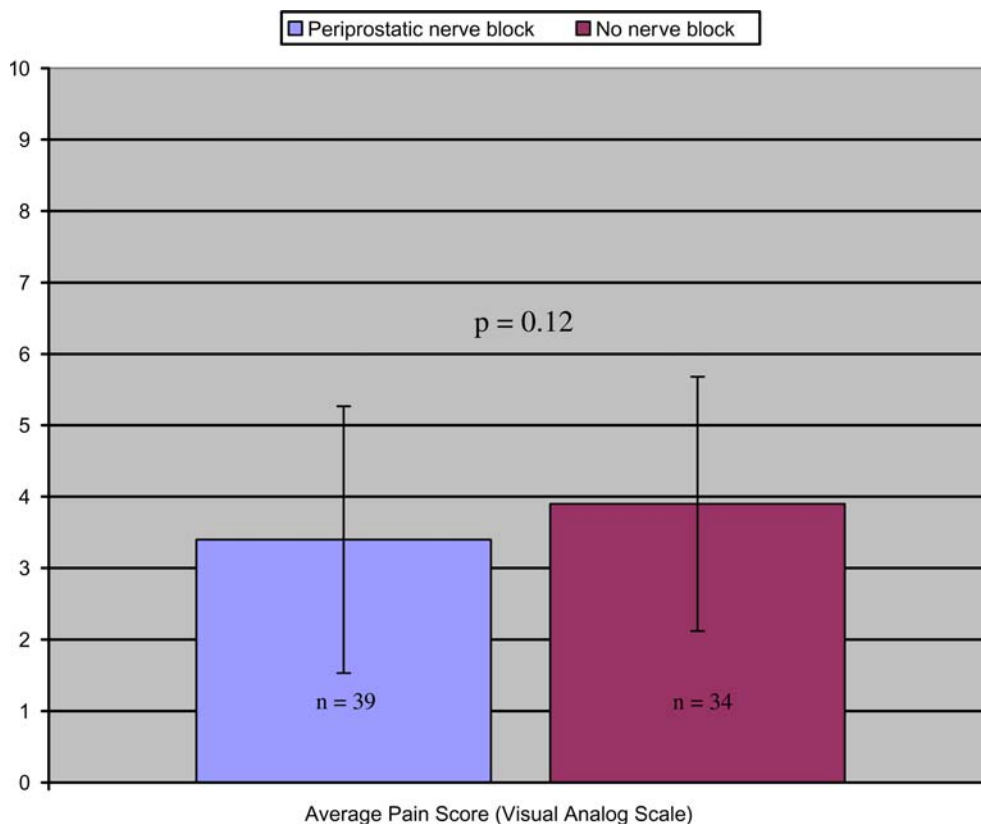


Fig. 2 Mean pain scores (standard deviation) during cystoscopy on a 11 point visual analog scale (*left*, periprostatic nerve block; *right*, no nerve block)



published their experience with a transperineal periprostatic nerve block for transurethral needle ablation of the prostate, as well as for interstitial laser coagulation of the prostate [5, 6]. A suprapubic approach for periprostatic nerve block has also been reported to be effective in transurethral prostatic surgery [14]. Additionally, there is the possibility of a transurethral submucosal lidocaine infiltration of the prostate and this method has reportedly been an effective anesthesia for transurethral incision of the prostate [4, 10].

Recently, the transrectal periprostatic nerve block has been shown in many studies to be a safe, fast, and very effective way to anesthetize the prostate prior to standard needle biopsy of the prostate [1, 2, 9, 13, 15]. This form of local anesthesia has also been reported to be effective for transurethral prostatic surgery [17].

Periprostatic nerve block reportedly is an effective anesthesia for transurethral prostatic surgery and the transrectal approach is a standardized and very simple way to achieve this anesthesia. We conducted this study to evaluate if a transrectal periprostatic nerve block could be used to reduce the discomfort in routine diagnostic transurethral procedures. However, we did not find any difference between the pain caused by a rigid cystoscopy with or without periprostatic nerve block. There are several possible reasons that could explain this inconsistency with the expected result.

In our view, the main reason is the afferent nerves that are mainly involved with the perception of pain during a cystoscopy are probably bladder afferents or

afferent fibers from the pelvic floor that run with the pudendus nerve and those are not anesthetized by a periprostatic nerve block. In this case, the question remains why any form of periprostatic local anesthesia should be helpful in transurethral prostatic surgery. However, most of the above mentioned studies that showed such an effect were feasibility studies rather than controlled trials and most of the patients involved received at least some form of systemic sedation or analgesia in addition to the local anesthesia. In our study, we had a matched control group and none of the patients in either group received any form of additional systemic sedation or analgesia. Additionally, local anesthesia has never been widely accepted as an option for transurethral prostatic surgery, which further supports the notion that it is not as effective as pointed out in some reports.

A second possible reason for the negative results could be that our periprostatic nerve block was not sufficient. Against this explanation stands that we used our standard technique for transrectal periprostatic nerve block where the lidocaine solution is delivered to the neurovascular bundles under direct sonographic control. Like many urologists worldwide, we have made excellent experience with this technique in transrectal biopsy of the prostate.

A third reason might be that the pain caused by a routine cystoscopy is generally so insignificant that an effective reduction of that pain can hardly be achieved by any means. However, the average discomfort during

cystoscopy was rated mild to moderate by our patients with some individuals experiencing severe pain, which is in accordance to other reports [3]. This situation is in fact very similar to pain scores reported from traditional transrectal biopsies of the prostate. In that field, it has been repeatedly shown in the last few years that an effective local anesthesia can improve patients comfort very significantly, also in a moderately painful procedure [1, 2, 9, 13, 15].

An additional reason could be that the number of patients that were included in our study was too small. It is in fact possible that the difference in average pain scores would become significant in an adequately large sample size. We believe, however, that such a small difference would not be of any clinical relevance and we are convinced that a periprostatic local anesthesia is ineffective in transurethral procedures.

Conclusions

In contrast to earlier reports, our results do not support the use of a periprostatic nerve block to reduce the pain associated with transurethral manipulations.

References

- Adamakis I, Mitropoulos D, Haritopoulos K, Alamanis C, Stravodimos K, Giannopoulos A (2004) Pain during transrectal ultrasonography guided prostate biopsy: a randomized prospective trial comparing periprostatic infiltration with lidocaine with the intrarectal instillation of lidocaine-prilocain cream. *World J Urol* 22(4):281–284
- Alavi AS, Soloway MS, Vaidya A, Lynne CM, Gheiler EL (2001) Local anesthesia for ultrasound guided prostate biopsy: a prospective randomized trial comparing 2 methods. *J Urol* 166(4):1343–1345
- Goldfischer ER, Cromie WJ, Karrison TG, Naszkiewicz L, Gerber GS (1997) Randomized, prospective, double-blind study of the effects on pain perception of lidocaine jelly versus plain lubricant during outpatient rigid cystoscopy. *J Urol* 157(1):90–94
- Graversen PH, Gasser TC, Larsen EH, Dorflinger T, Bruske-witz RC (1987) Transurethral incisions of the prostate under local anaesthesia in high-risk patients: a pilot study. *Scand J Urol Nephrol Suppl* 104:87–90
- Issa MM, Ritenour C, Greenberger M, Hollabaugh R Jr, Steiner M (1998) The prostate anesthetic block for outpatient prostate surgery. *World J Urol* 16(6):378–383
- Issa MM, Stein B, Benson R, Knoll LD, Fay R (2000) Prospective multicenter study of transperineal prostatic block for transurethral needle ablation of the prostate. *Urology* 56(6):1052–1055
- Leach GE, Sirls L, Ganabathi K, Roskamp D, Dmochowski R (1994) Outpatient visual laser-assisted prostatectomy under local anesthesia. *Urology* 43(2):149–153
- Moffat NA (1977) Transurethral prostatic resections under local anesthesia. *J Urol* 118(4):607–608
- Nash PA, Bruce JE, Induhara R, Shinohara K (1996) Transrectal ultrasound guided prostatic nerve blockade eases systematic needle biopsy of the prostate. *J Urol* 155(2):607–609
- Orandi A (1984) Urological endoscopic surgery under local anesthesia: a cost-reducing idea. *J Urol* 132(6):1146–1147
- Paick JS, Donatucci CF, Lue TF (1993) Anatomy of cavernous nerves distal to prostate: microdissection study in adult male cadavers. *Urology* 42(2):145–149
- Schlegel PN, Walsh PC (1987) Neuroanatomical approach to radical cystoprostatectomy with preservation of sexual function. *J Urol* 138(6):1402–1406
- Seymour H, Perry MJ, Lee-Elliot C, Dundas D, Patel U (2001) Pain after transrectal ultrasonography-guided prostate biopsy: the advantages of periprostatic local anaesthesia. *BJU Int* 88(6):540–544
- Tabet BG, Levine S (1996) Nerve block in prostate surgery. *J Urol* 156(5):1659–1661
- von Knobloch R, Weber J, Varga Z, Feiber H, Heidenreich A, Hofmann R (2002) Bilateral fine-needle administered local anaesthetic nerve block for pain control during TRUS-guided multi-core prostate biopsy: a prospective randomised trial. *Eur Urol* 41(5):508–514; discussion 514
- Walsh PC, Lepor H, Eggleston JC (1983) Radical prostatectomy with preservation of sexual function: anatomical and pathological considerations. *Prostate* 4(5):473–485
- Zlotta AR, Schulman CC (1999) Interstitial laser coagulation for the treatment of benign prostatic hyperplasia using local anaesthesia only. *BJU Int* 83(3):341–342