

## A comparative study of 2% lidocaine solution versus 2% lidocaine jelly as a topical anesthetic agent during cystoscopy

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A double blind, randomized, prospective study was performed to compare the efficacy of 2 % lidocaine solution with 2 % lidocaine jelly in pain relief for male outpatient cystoscopy. The degree of pain was recorded on a visual analogue scale by the patient and on a four-point descriptive pain scale by both the patient and the surgeon. The results showed no significant difference between the two treatments. The surgeons perception of pain correlated well with the patient pain estimation. Age and previous experience with cystoscopy did not significantly affect the pain perception. In conclusion, we found that both 2 % lidocaine solution and 2 % lidocaine jelly had equal efficacy as topical anesthetics during cystoscopy.

**Index:** Topical anesthetic, Cystoscopy

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For outpatient settings of endoscopic urology, especially cystoscopy, topical application of lidocaine has been used since 1949 when it was introduced by Haines and Grabstald.<sup>(1)</sup> From the start, urologists used 2 % lidocaine solution with good efficacy and safety, but later many urologists used 2 % lidocaine jelly with equally satisfied results.<sup>(2,3)</sup> Langston et al. showed that in dogs 2 % lidocaine gel was more effective than an aqueous solution<sup>(4)</sup> but there were no prospective randomized studies to validate this efficacy in humans. Since women have lower levels of pain during cystoscopy and it is difficult to maintain lidocaine in the female urethra, we excluded the female patients from this study and only compared the efficacy of the two forms of lidocaine for rigid cystoscopy in men.

#### Materials and methods

All male patients scheduled for outpatient cystoscopy during the 3 month period of June to August, 1996 were asked to participate in a randomized double-blind study. Excluding patients with chronic pelvic pain,

prostatitis and previous radiotherapy to the pelvic organ, 118 patients were randomized into two groups. For study with 2% lidocaine jelly and 2% lidocaine solution. Immediately following the cystoscopy, the patients were asked to rate the discomfort caused by the procedure by completion of both a four-point descriptive pain scale (nil, mild, moderate, and severe) and a visual analogue scale (VAS). The VAS score calculated from the distance (in millimetres) measured from the "no pain" end of the scale to the point marked by the patient as representative of their perceived pain.<sup>(5)</sup> The surgeon was also asked to rate his perception of the patient's discomfort on a four-point descriptive pain scale. Statistically, the VAS scores were evaluated using the Mann-Whitney U test, and the four-point descriptive pain scale used by the patients and the surgeons were evaluated with the Pearson chi-square test. Correlation was analysed with Spearman's rank correlation test. The influence of the patients age and previous experience with cystoscopy, were also analysed using the Mann-Whitney U. test

**Table 1** Age and visual analogue scale (VAS) scores

		Group 1 Lidocaine jelly (n=59)	Group 2 Lidocaine solution (n=59)	p Value
age (years)	Mean	58.9	61.2	not significant
	SD	17.3	12.7	
VAS (mm)	Mean	23.4	25.8	not significant
	SD	16.0	18.5	

**Table 2** Four-point scale: patient and surgeon ratings

Degree of pain	Group 1 Lidocaine jelly (n=59)	Group 2 Lidocaine solution (n=59)	p Value
Patient rating			
nil	20	13	not significant
mild	22	27	
moderate	13	17	not significant
severe	4	2	
Surgeon rating			
nil	24	17	not significant
mild	26	37	
moderate	6	4	not significant
severe	3	1	

**Table 3** VAS scores of subgroups of patients irrespective of treatment

Patient's subgroup	No. Patients	Mean VAS (mm)	p Value
age < 55 years	34	27.3	not significant
age > 55 years	8	23.5	
prior cystoscopy	47	21.8	not significant
no prior cystoscopy	71	26.5	

## Results

Details of the two groups ages and VAS scores are shown in table 1. The mean VAS pain score among the patients was 23.4 in 59 who received 2% lidocaine jelly and 25.8 in 59 who received 2% lidocaine solution. This difference was not significant ( $p = 0.57$ ). The results from the patient and the surgeon four-point pain scales are shown in table 2. No statistical significance was also seen to exist between the two groups. The surgeon estimation of the pain was significantly correlated with the pain reported by the patients. There was no significant difference of the VAS pain score between the patients

older than 55 years of age and the younger patients.

Of the 118 patients, 47 had undergone at least 1 prior cystoscopy while 71 were undergoing their initial examination. In calculating the mean degree of discomfort irrespective of anesthetic used, there was no statistically significant difference between the groups. (Table 3).

## Discussion

As a matter of practice, most urologists in our region pretreat the male urethra with a lidocaine anesthetic before cystoscopy. Many urologists use lidocaine in gel form while others use lidocaine in aqueous solution. Both show good results as described by many authors. The

international generally recommended dose ranges for 2% lidocaine jelly and 2% lidocaine solution for cystoscopy in men are 11-20 ml and 10-20 ml, respectively.<sup>(1,2,6)</sup> Pliskin et al suggested a 4 minute minimum dwell time before the procedure<sup>(7)</sup> while the recommendation described in the package of lidocaine jelly is 5 to 10 minutes and this is equal to the dwell time for 2 % lidocaine solution used by Persky and Davis with good results. This study used 20 ml in volume and 10 minutes dwell time for both treatment groups.

The results showed that there was no statistical difference of the patient estimation of pain between the two treatments as determined by both the VAS pain score and four-point descriptive pain scale. No statistical difference of the surgeon's estimation of pain between treatments could be demonstrated. Because discomfort from cystoscopy depended on several factors, such as sensation of the surface of the urethra, pressure force applied to the sphincter, prostate and bladder neck, and anxiety, etc., using lidocaine topically, either in the form of jelly or solution alone may block only subepithelial plexus in the urethra but not the deep structures at the posterior urethra.<sup>(8,9)</sup> Therefore, we could relieve the cystoscopy discomfort only partially, but this was adequate for the patients to tolerate the procedure. We

found that careful instrumentation, lidocaine provided in adequate volume, and adequate dwell time were necessary for patients undergoing cystoscopy.

Contrary to Barnhouse et al.<sup>(10)</sup> and Stein et al.<sup>(11)</sup> we demonstrated that the surgeon's estimation of pain significantly correlated with the patient pain perception. This is probably due to our surgeons paying more attention to patient discomfort during the procedure than in earlier studies. We could not demonstrate the effect of aging on the perception of pain. We could not confirm what many urologists suspect, namely that older patients tolerate cystoscopy better than younger subjects. The present study also failed to demonstrate any significant difference between the pain perception of patients who had previous experiences of cystoscopy and those who had not.

In conclusion, both 20 ml of 2 % lidocaine jelly and 2 % lidocaine solution has been shown to be effective in providing anesthesia for cystoscopy in male patients. Careful instrumentation may also be a significant factor. Given the cost involved (2 % lidocaine jelly at 80 Baht/patient, 2 % lidocaine solution at 30.8 Baht/patient) we could gain cost savings from preferential use of 2 % lidocaine in solution for cystoscopy (49,200 Baht saving for every 1,000 procedures).

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