SCIENTIFIC CORRESPONDENCE

Efficacy of lignocaine 2% gel in chalazion surgery

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Background/aims: To determine whether topical 2% lignocaine (lidocaine) gel is an effective anaesthetic agent for chalazion surgery.

Methods: In a randomised controlled clinical trial, 57 subjects aged 12 years or over requiring incision and curettage for chalazion were recruited over an 8 month period. Patients were randomised into two groups. One group received 1.5 ml of lignocaine 2% injection and the other 1.5 ml of lignocaine 2% gel topically. Standard incision and curettage was then performed. The primary outcome of interest was the total pain experienced during the entire procedure including anaesthetic administration as well as incision and curettage. The pain from the local anaesthetic administration and during incision and curettage was assessed independently using a visual analogue scale (0–100). The sum of these two scores would be the total pain score out of 200. "Fear of injection" score (0–100) was also assessed.

Results: There was a statistically significant difference in the mean total pain scores between the injection and the gel groups (95.6 v 57.0) ($p < 0.001$) ($\alpha = 0.05$) ($1 - \beta = 0.9394$). There was a statistically significant difference in the mean scores on "pain of anaesthetic administration" (47.0 v 5.5) ($p < 0.000$). There was no statistically significant differences in the mean scores on "fear of injection" (43.9 v 47.7) ($p = 0.668$) and "pain during incision and curettage" (48.28 v 51.4) ($p = 0.679$).

Conclusions: Lignocaine 2% gel is effective in chalazion surgery especially in lowering the pain caused by anaesthetic administration.

A chalazion (meibomian cyst) is a chronic lipogranulomatous inflammatory lesion caused by blockage of gland orifices and stagnation of sebaceous secretions. They may press on the cornea and cause blurred vision from the induced astigmatism. Up to 50% of chalazia may be cured or improved with medical treatment within 1 month.¹ However, the remainder will usually require surgical intervention for further resolution. The use of intralesional steroids has been advocated in the treatment of chalazia. However, this has only been effective in small, multiple, and marginal chalazia whereas incision and curettage is more effective in larger lesions.² A significant proportion of patients with chalazia will therefore require surgical treatment with incision and curettage for complete resolution.

Incision and curettage for chalazia is conventionally performed with local anaesthetic injections (transcutaneous) such as lignocaine (lidocaine) 2%. Complications associated with the injections may include bleeding from the injection site, haematoma formation, and ocular damage if the injection penetrates through the eyeball. The injection of local anaesthetic solutions is frequently a painful and unpleasant experience for patients.³ Infiltration of the skin and subcutaneous tissues with local anaesthetic solutions produces pain

and burning discomfort,^{4,5} which is often severe enough to be the most unpleasant part of a minor surgical procedure.

Lignocaine 2% gel has already established its role in cataract surgery.^{6,7} There has been a significant shift towards the use of topical anaesthesia for routine cataract surgery in the past few years. The potential role of this topical anaesthetic agent in chalazion surgery has not yet been established.

Although chalazia are more common in adults, they frequently occur in children.⁸ If medical treatment fails, surgical incision and curettage under local anaesthesia is usually required as a long delay may result in granulation tissue formation in the tarsal plate.⁹ Injection of local anaesthetic is a painful procedure. If the child does not cooperate, there is a risk of injury to the globe from the injection needle. General anaesthesia, however, suffers from inconvenience, higher costs, and complications. A technique to achieve local anaesthesia painlessly may potentially avoid the use of general anaesthesia for chalazion surgery in children.

Lignocaine 2% gel may be particularly useful in children. Lignocaine-prilocaine cream has been used with success in children but this is for external use when the incision is made through skin only.¹⁰ The cream cannot be directly applied to palpebral conjunctiva through which incision is usually made in chalazion surgery. Lignocaine gel can be directly applied to the palpebral conjunctiva in which the surgical incision is made as well as onto skin.

MATERIALS AND METHODS

Our institutional ethics committee approved the study. Informed consent was obtained from 57 consecutive subjects, aged over 12 years, undergoing incision and curettage for chalazion. Subjects were excluded if they were under 12 years of age. Subjects with other ocular or systemic conditions requiring the regular use of analgesics were excluded. Subjects with previous lid surgery or chalazion surgery or lid trauma and scarring were excluded. Subjects with medical, psychological, or social conditions predisposing to a different perception of pain and in whom pain scores could not be reliably assessed were also excluded.

Patients were randomised using a centrally coordinated random table. All patients were asked to participate in the study if they fulfilled the inclusion criteria and passed the exclusion criteria. The random digit would only be revealed to the surgeon once the patient had signed the consent form. We reassured our patients that if the standard regimen did not give adequate analgesia or the patient could not tolerate the pain, supplementary analgesia would be given.

Once patients were randomised and allocated treatment, standard doses of 1.5 ml of either lignocaine 2% gel or lignocaine 2% injection were applied or injected around the chalazion, approximately 1 cm diameter. Gel was applied over the skin surface as well as onto the palpebral conjunctiva. Then we waited for 5 minutes to allow the anaesthetic to work before proceeding with incision and curettage. This involved placing a chalazion clamp over the entire region of the chalazion for haemostasis. An incision was then made in the palpebral conjunctiva underlying the chalazion. Contents were then drained and cleared with a curette.

Table 1 Summary of patient demographics

	No	Mean score/No	SD	p Value
Age				
injection	29	34.1	18.2	0.878
gel	28	34.8	17.0	
Sex				
injection	29	17 male, 12 female		0.522
gel	28	14 male, 14 female		
Fear				
injection	29	43.9	28.9	0.666
gel	28	47.7	36.1	

The operated eye was pressure patched for 5 minutes or until haemostasis was achieved. The wound was then re-examined. If good haemostasis was achieved, the eye was padded for 1 day with antibiotic ointment and then removed. Immediately after the operation, while the eye was still padded, the evaluator assessed the pain experienced during incision and curettage. The pain from the local anaesthetic administration was also assessed. In the injection group, this represented the overall pain experienced from both the introduction of the needle as well as anaesthetic infiltration. In the gel group this represented any pain experienced from the application of the gel alone. A 0–100 visual analogue scale was used to assess pain. A score of zero represented no pain at all. A score of 100 represented the worst pain ever. “Fear of injection” score was evaluated preoperatively using a 0–100 visual analogue scale. A score of zero was given for no fear at all, and a score of 100 was given for worse fear ever. The patient was asked to put a cross on the 0–100 visual analogue scale. The end point for curettage in all cases was the complete removal of all removable contents.

RESULTS

Fifty seven subjects were invited to participate and 57 subjects were successfully recruited in total ($n = 57$) with 29 in the injection group and 28 in the gel group. The mean age of the injection group was 34.1 (SD 18.2), and the gel group 34.8 (16.9). There were 17 males and 12 females in the injection group. There were 14 males and 14 females in the gel group. The mean scores on “fear of injection” were 43.9 (28.9) in the injection group and 47.7 (36.1) in the gel group. There was no statistically significant difference in the mean age ($p = 0.878$), sex ($p = 0.522$) and scores on “fear of injection” ($p = 0.668$) at 5% level of significance (Table 1).

The mean total pain score in the injection group was 95.6 (49.9), and in the gel group was 57.0 (31.7). The mean pain score during anaesthetic administration was 47.0 (26.6) in the injection group and 5.5 (11.7) in the gel group. The mean pain score during incision and curettage was 48.3 (28.4) in the injection group, and 51.4 (28.8) in the gel group.

There was a statistically significant difference in mean total pain score at the 5% level of significance ($p = 0.001$). There was a statistically significant difference in mean pain score experienced during anaesthetic administration at the 5% level of significance ($p = 0.000$). There was no significant difference in mean pain score experienced during incision and curettage at the 5% level of significance ($p = 0.679$) (Table 2). The Mann-Whitney U test for the above mean scores were consistent with the test results in terms of statistical significance. p Values were 0.002, 0.000, and 0.712 respectively.

In the injection group there were 17 upper lid and 12 lower lid chalazia. In the gel group there were 12 upper lid and 16 lower lid chalazia. There were no statistically significant differences in mean pain scores at the 5% level of significance between upper and lower lid chalazia in general or within each group.

Table 2 Summary of visual analogue pain scores

	No	Mean score	SD	p Value
Total pain				
injection	29	95.6	49.9	0.001
gel	28	57.0	31.7	
Pain anaesthesia				
injection	29	47.0	26.6	0.000
gel	28	5.5	11.7	
Pain I&C				
injection	29	48.3	28.4	0.679
gel	28	51.4	28.8	

I&C = incision and curettage.

Overall, the injection group experienced more pain for the entire procedure. The injection group also experienced more pain on administration of anaesthesia. However, the two groups were comparable in terms of pain experienced during incision and curettage. A statistical power of 0.9394 is obtained for the main outcome measure “total pain score” ($1 - \beta = 0.9394$). The statistical power for pain during anaesthesia was 0.999. For a minimal clinically significant difference of 20 between the two groups for pain during incision and curettage, the statistical power calculated was 0.7580.

DISCUSSION

Most patients have substantial psychological fears of injections. The “fear of injection” scores among the study subjects confirmed this. The scores were similar in the two groups. This reduced the possible bias as a consequence of differences in psychological fear.

Since treatment was given in one setting and the outcomes were evaluated immediately, we did not have any problems with compliance or losses to follow which might violate randomisation and reduce comparability between treatment groups.

The two groups were comparable in age and sex distribution. This reduced any potential bias due to uneven distribution of study subjects. This confirmation of the comparability of the two treatment arm subjects after randomisation added further to our confidence that any difference in outcome could be truly attributed to the test treatment.

None of the study subjects included were unable to tolerate the incision and curettage procedure as a result of inadequate analgesia and unbearable pain. All subjects received the designated treatment. None of the gel group required reversion to conventional injection anaesthesia because of inadequate anaesthesia by lignocaine gel.

Specific measures were taken to maintain the integrity of randomisation. One person using a random table centrally coordinated the randomisation. Treatment arms were revealed to the surgeon only after enrolment in the study. This reduced any bias as a result of prior knowledge of the treatment arm and subsequent recruitment. The comparability in terms of group size, age, sex, and fear of injection further consolidated the integrity of the randomisation.

Ideally, patients, treatment team, and evaluators should be kept ignorant of group allocation and treatment group. We had considered the use of normal saline as placebo for injection and methylcellulose as placebo for gel. However, we would not be able to compare the pain scores for anaesthetic administration, which was one of our main outcome measures. Placebo was therefore not used and complete blinding was not achieved.

Another limitation of our study was the potential bias due to surgeon variation. We tried to minimise the variation by including only surgeons with similar level of experience. The

use of randomisation should, however, reduce or eliminate any known or unknown confounders including surgeon variation.

We would also like to share some of the experience and practical tips gained from the verbal feedback of our patients, which may reduce patient discomfort. Regardless of whether gel or injection anaesthesia was used, the pressure effect of the clamping of the chalazion clamp and curettage is often the most unpleasant part of the procedure besides injection.

Keeping the clamping time as short as possible will cause the least discomfort to patients. We may consider adding either lignocaine 2% solution or lignocaine 2% gel using a cannula into the incision opening before curettage. Immediate postoperative discomfort can also be reduced by patching the eye with lignocaine 2% gel for 5 minutes or until haemostasis is achieved before irrigation and patching with conventional antibiotics.

CONCLUSION

We conclude that 2% lignocaine gel is effective in chalazion surgery especially in lowering the pain due to anaesthetic administration. This method of anaesthesia would be particularly useful in patients who have distressing fears of injection and in whom poor cooperation renders the patient vulnerable to needle related injuries.

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