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Main Article

Timing of co-phenylcaine administration before rigid nasendoscopy: a randomized, controlled trial

D D Pothier, C E J Hall, S Gillett, P Nankivell

Abstract

Rigid nasendoscopy is a commonly used method of examining the nasal cavity and postnasal space. Co-phenylcaine is useful for its vasoconstrictive and anaesthetic properties, but the length of time allowed for it to take effect is variable. We performed a single-blind, randomized, controlled trial to determine whether it was better to allow one or 10 minutes for co-phenylcaine to take effect. Fifty patients were randomized into two groups, 25 in each. Patients in the 10 minute group experienced less discomfort ($p = 0.02$) and less pain ($p = 0.018$) than those in the one minute group. Ease of examination was also greater in the 10 minute group, as was the quality of the image obtained ($p < 0.001$).

Key words: Nasal Cavity; Anaesthetics, Local; Endoscopy

Introduction

Nasendoscopy in the out-patient department has revolutionized the examination of the nasal cavity and postnasal space. A flexible nasendoscope may be used to examine the nasal cavity, but it has been shown that a rigid nasendoscope is a more effective instrument for this purpose.[1] Various studies have discussed the relative merits of topical anaesthetic agents used prior to rigid and flexible nasendoscopy, as well as the use of vasoconstrictor agents; it has been shown that topical anaesthetics are not necessary for flexible nasendoscopy[2,3] but are of value for rigid nasendoscopy, as are vasoconstrictors.[4]

Co-phenylcaine (lignocaine and phenylephrine) increases the quality of the nasal cavity examination as well as improving the experience for the patient, but practice varies as to how long before rigid nasendoscopy the co-phenylcaine should be applied. It is possible that leaving inadequate time between the application of the preparation and the nasendoscopy may not be as beneficial as waiting for the preparation to take full effect; conversely, this extra time may be wasted if the preparation works quickly. In the context of nasendoscopy, little data exist on co-phenylcaine's speed of effect.

Null hypothesis

Our null hypothesis proposed that the timing of the application of co-phenylcaine before rigid nasendoscopy has no effect on the following: levels of discomfort or pain experienced by the patient; quality of the image seen during nasendoscopy; and ease with which the nasendoscope is passed.

Methods

A prospective, single-blind, randomized, controlled trial was designed.

Participants

Fifty consecutive patients were recruited between 1 December 2005 and 30 January 2006. They were all attendees at the otolaryngology out-patient clinic at the Royal United Hospital, Bath.

Criteria for inclusion were: adults who required a full endoscopy of both nasal cavities and the postnasal space as part of their examination; and patients in whom informed consent could be obtained. All patients with gross nasal polyposis were excluded as a full nasendoscopy would not have been possible. Recruited patients were taken to a separate room and kept there for 15 minutes by an investigator who was not involved with the examination of the patient; here, they received co-phenylcaine applied either one minute (group one) or 10 minutes (group two) before returning to the examining investigator.

The examination was then performed with a Richards 4 mm rigid endoscope (Gyrus Group, Reading, UK) using a portable light source (GVR Products, Stoke-on-Trent, UK).

From the Department of ENT, Royal United Hospital, Bath, UK.
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Outcome measurements

After the examination had been performed, the patient was asked to complete a visual analogue score (VAS) sheet.

The patient was asked to indicate the following on a VAS: discomfort caused by the procedure (0 = no discomfort, 100 = very uncomfortable); and pain caused by the procedure (0 = no pain, 100 = very painful).

The nasendoscopist was asked to indicate the following on a VAS: difficulty of passing nasendoscope (0 = no difficulty, 100 = very difficult); and loss of clarity of image (0 = no loss of image, 100 = total loss of image).

The VAS scales were each 100 mm in length. Measurement of the VAS was to the nearest millimetre, with zero being taken as the left edge of the scale.

Power calculation

A difference between the population means of 10 mm was considered to be clinically significant. Using a standard deviation of 12 mm, based on data from flexible nasendoscopy by Pothier *et al.*,[5] a sample size calculation was performed, which showed that 24 participants were required in each group in order to provide a power of 80 per cent at 95 per cent confidence.

Randomization

Allocation was by means of opaque envelopes each containing a single proforma on which the specified group was marked (25 envelopes in each group); the envelope was blindly selected at random by the patient. The non-examining investigator opened the envelope after it had been chosen by the patient.

Statistical analysis

Data were imported into the Statistical Package for the Social Sciences version 11.0 software for analysis. Distribution of VAS data for discomfort, pain, difficulty of endoscope passage and loss of image clarity were analysed for normality. The data were not normally distributed, and a Mann–Whitney U test was used to determine levels of statistical significance.

Ethical considerations

Prior to recruitment, the study received the necessary review from the local research ethics committee and ethical approval was granted.

Results

All patients who gave consent to participate in the study completed the examination and the questionnaire. There was no change between arms during the study and no patient withdrew consent at any time. The mean age of participants was 49.9 years (range 18–86, standard deviation 18.6); 54 per cent of participants were male and 46 per cent female. No side-effects or complications were reported at the time of nasendoscopy in either group.

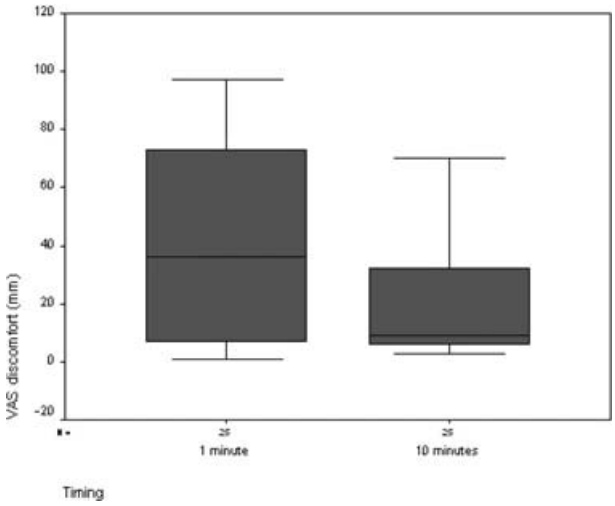

FIG. 1

Box plot of visual analogue scores (VAS) (0–100) for discomfort, for the groups anaesthetized at one and 10 minutes (medians = 39 and 8, respectively).

Levels of pain and discomfort

Figure 1 shows the VAS distribution for discomfort experienced by the patient. Levels of discomfort experienced by the patient were lower for the 10 minute group ($p = 0.02$). Figure 2 shows the VAS distribution for pain experienced by the patient. Levels of pain experienced by the patient were lower for the 10 minute group ($p = 0.018$).

Difficulty and loss of clarity of image

Figures 3 and 4 show the VAS distributions for difficulty of nasendoscope insertion and extent of loss of clarity of nasendoscope image, respectively. The level of difficulty of nasendoscope insertion was greater in the one minute group than in the 10 minute group ($p = 0.001$) and the nasendoscope

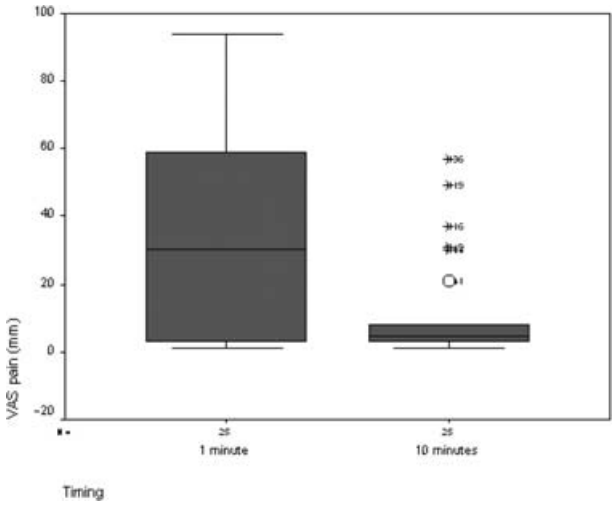

FIG. 2

Box plot of visual analogue scores (VAS) (0–100) for pain, for the groups anaesthetized at one and 10 minutes (medians = 29 and 4, respectively).

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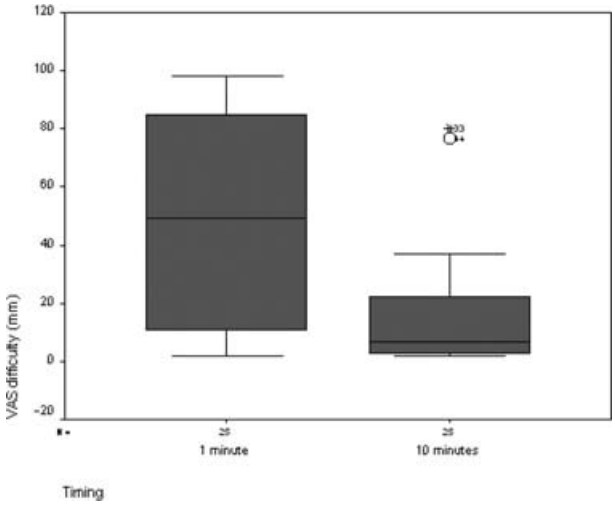

FIG. 3

Box plot of visual analogue scores (VAS) (0–100) for difficulty of nasendoscope insertion, for the groups anaesthetized at one and 10 minutes (medians = 50 and 9, respectively).

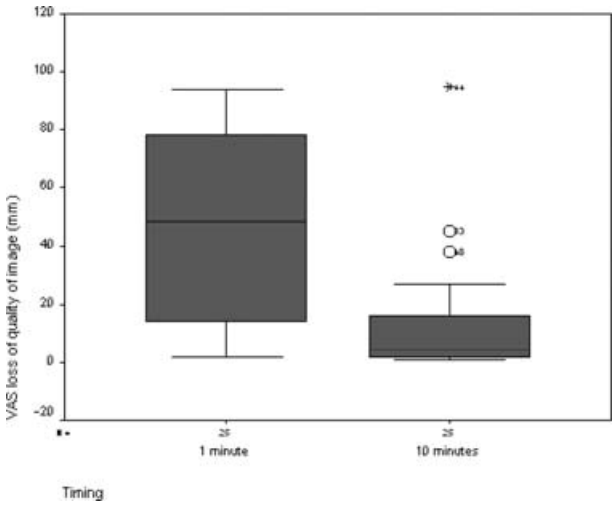

FIG. 4

Box plot of visual analogue scores (VAS) (0–100) for loss of quality of nasendoscope image, for the groups anaesthetized at one and 10 minutes (medians = 51 and 4, respectively).

image obtained in the 10 minute group was also better ($p < 0.001$). No subgroup analysis was undertaken.

Discussion

Current evidence suggests that it is unnecessary to use a topical anaesthetic[2,3] or lubricant[5] in the nasal cavity prior to flexible fibre-optic nasendoscopy, but these are of value in rigid nasendoscopy, particularly when combined with a vasoconstrictor.[4] Our results show the importance of waiting for the preparation to take effect before performing nasendoscopy.

Our study was single-blinded as a placebo arm would have been very difficult to construct, as the effects of the anaesthetic in the spray were immediately obvious to the participant. For this reason, the results of the pain and discomfort scores were subject to bias. The scores for difficulty and image quality are likely to be more reliable.

It is unclear how long before rigid nasendoscopy the co-phenylcaine should be applied, as we only tested application times of one and ten minutes. Further research should be conducted in this area to establish the minimum amount of time required to achieve maximum effect.

- **Rigid nasendoscopy is a useful tool for examining the nasal cavity and postnasal space**
- **Co-phenylcaine is effective anaesthesia for rigid nasendoscopy**
- **The length of time allowed for the co-phenylcaine to take effect before nasendoscopy varies in practice and may affect the procedure**
- **Waiting 10 minutes for co-phenylcaine to take effect prior to rigid nasendoscopy significantly reduces the levels of pain and discomfort experienced by the patient**
- **Waiting 10 minutes for co-phenylcaine to take effect prior to rigid nasendoscopy makes endoscope insertion easier and improves the quality of the image obtained by the endoscopist**

Conclusions

These data show that allowing 10 minutes for co-phenylcaine to take effect prior to rigid nasendoscopy reduces levels of pain and discomfort for the patient as well as making endoscope insertion easier and improving the quality of the image obtained.

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Address for correspondence:
Mr David D Pothier,
Specialist Registrar in Otolaryngology,
Royal United Hospital,
Bath BA1 3NG, UK.

Fax: 0797 4012299
E-mail: email@davepothier.com

Mr D D Pothier takes responsibility for the integrity of the content of the paper.
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