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Short Communication

Tympanic thermometry and minor ear surgery

A. Tomkinson, F.R.C.S., D. G. Roblin, F.R.C.S., S. M. Quine, F.R.C.S., P. Flanagan, F.R.C.S.

Abstract

Infra-red tympanic thermometry is a relatively new technique for measuring body temperature which requires the minimum of co-operation and is quick and easy to use. It is therefore ideal for use in children. Its use is becoming more widespread and as it is theoretically possible that minor ear surgery may interfere with function its reliability in these patients may be in question.

Twenty-two children (mean age 5.3 years) who underwent myringotomy ± grommet insertion had the tympanic temperature of each ear measured immediately before, and 15 minutes after, surgery on the recovery ward. No difference was found between the pre- and post-operative temperatures (mean difference – 0.1°C, $p>0.1$, paired t-test, hypothesized difference of 0).

This thermometer appears to be a reliable way of monitoring body temperature on a paediatric ENT recovery ward in patients who have undergone minor ear surgery.

Key words: Tympanic membrane; Thermometers; Paediatrics

Introduction

Tympanic thermometry is a relatively new cost-effective technique for quickly measuring a patient's body temperature (Alexander and Kelly, 1991). Its ease of use and accuracy, associated with the minimum co-operation required from the subject makes this type of thermometer ideal for use in post-anaesthetic patients and especially post-anaesthetic children (Chamberlain *et al.*, 1991; Edge and Morgan, 1993). The accuracy of this device has compared very favourably to alternative but less convenient methods (Erickson and Kirklin, 1993; Klein *et al.*, 1993; White *et al.*, 1994) and as its popularity spreads it seems reasonable that staff may consider using this thermometer in a post-operative ward following minor ENT surgery. Although it seems unlikely that removing a small quantity of fluid from the middle ear would significantly affect the operation of this device, this assumption has not been formally tested.

Patients and methods

A preliminary study of 20 patients, average age 7.6 years (range four to 13), receiving only tonsillectomy was undertaken. A tympanic membrane thermometer (First-Temp® Genius™) was used to measure the tympanic membrane temperature in each ear before, and after, surgery.

A further 22 children, average age 5.3 years (range three to nine years), with otitis media with effusion who were admitted for minor ear surgery under general anaesthesia were examined. The surgery included myringotomy with fluid aspiration and possible grommet insertion. Each child had a tympanic membrane temperature measurement taken from each ear immediately following induction of anaesthesia, and at 15 minutes following surgery on the recovery ward.

Patients with otitis media with effusion, confirmed by myringotomy and aspiration of fluid were assigned to the test group. A grommet was inserted if required.

Results

In the tonsillectomy only group the mean pre-operative temperature was 36.9 ± 0.4°C, the post-operative was 37.1 ± 0.3°C. A change in temperature of 0.5°C following aspiration of middle ear fluid was considered significant. If one uses the standard deviation for tympanic temperatures derived from the non-ear surgery group then, a minimum of 40 samples would be required for a 0.01 significance level at a power of 90 per cent (Altman, 1980).

Twenty-one patients at operation had otitis media with effusion confirmed by the presence of fluid at myringotomy. A total of 42 years was included in the test group of which 35 ears received grommets. There was no difference between the pre- and post-operative temperatures in either the control group (mean difference – 0.2°C, $p>0.1$, paired t-test, hypothesized difference of 0) or the ear surgery group (mean difference – 0.1°C, $p>0.1$, paired t-test, hypothesized difference of 0).

Discussion

The value and reliability of tympanic thermometry have been extensively examined (Rogers *et al.*, 1991; Klein *et al.*, 1993; Romano *et al.*, 1993), and it appears to be a very

From the Department of Otolaryngology and Head and Neck Surgery, The University Hospital of Wales, Heath Park, Cardiff, Wales, UK.
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quick and easy, non-traumatic means of measuring body temperature (Edge and Morgan, 1993) which is perfectly suited for use in a paediatric post-operative recovery ward. Its ability to measure body temperature appears to be unaffected by the recent removal of serous fluid from the middle ear, or the insertion of a grommet, and it could therefore be reliably used on a paediatric ENT recovery ward with patients who have undergone such surgery. Although topical medication was not used in any of the patients in this study recovery staff should be aware if this has been used as it is theoretically possible that the presence of recently added drops, cream or ointment may interfere with the function of this thermometer.

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Address for correspondence:
Mr A. Tomkinson, F.R.C.S.,
The Department of Otolaryngology and
Head and Neck Surgery,
The University Hospital of Wales,
Heath Park,
Cardiff.