LONG-TERM EFFECT OF AUTOINFLATION IN THE TREATMENT OF SECRETORY OTITIS MEDIA

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SUMMARY

Introduction: Impaired middle ear ventilation plays an important role in the pathogenesis of secretory otitis media which is an extremely frequent condition in children. Since Politzer in 1863 devised his own method for active inflation of the middle ear, several studies have been published showing a beneficial effect of autoinflation in the treatment of secretory otitis.

Aim of study: The aim of the study has been to evaluate the long term effect of autoinflation on reducing the need for grommet insertion. To our knowledge this has not previously been done.

Subjects: Eighty children (93 ears) aged 4 to 10 years with secretory otitis media were randomised to either six weeks autoinflation using a nasal balloon (Otovent®) or into a control group treated with a decongestant nasal spray Clemastin®.

Results: During the 9 month follow-up, in total 20 out of 48 ears (42%) in the autoinflation group required ventilation tubes, compared to 30 out of 45 ears (67%) in the control group treated with decongestants.

Conclusion: Autoinflation may reduce the need for ventilation tubers to a great extent. The children should be followed as long as they are at risk of recurrence.

Key-words: Eustachian tube dysfunction, Otovent®, Clemastin®, grommets, follow-up

INTRODUCTION

It is well established that impaired middle ear ventilation plays an important role in the pathogenesis of secretory otitis media, where the persistent negative pressure induces metaplasia of the middle ear mucosa with goblet cell formation and subsequently effusion, filling the tympanic cavity (1). It is also seen clinically that if middle ear ventilation is

restored the mucosa normalises and the effusion clears. Most adults can ventilate the middle ear by performing Valsalva's manoeuvre, but for children the manoeuvre is difficult to learn, and it is almost impossible to control that the manoeuvre is carried out effectively. Since Politzer in 1863 (2) devised his own method for active inflation of the middle ear, several studies have been published showing a beneficial effect of autoinflation in the treatment of secretory otitis (3-8). In 1968 Hunt-Williams (4) introduced a method for middle ear ventilation in children. The children inflated carnival-blower through the nose, with or without a balloon. In 1992 Stangerup et al. (7) published a randomised, controlled study of children aged 3 to 10 years suffering from Eustachian tube dysfunction or secretory otitis media. One group was randomised to autoinflation, using a nose-piece mounted with a balloon, the other group was observed without treatment for two weeks. The nasal balloon inflation could normalise the middle ear pressure in 82% of the ears a negative middle ear pressure and improve or normalise the pressure in 52% of the ears with effusion. In 1993 Blanshard et al. (8) evaluated the same autoinflation technique in children recruited from the waiting list for grommet insertion. Of children with high compliance autoinflation, 68% had no effusion after 2 weeks, and 42% after 3 months.

The aim of the study has been to evaluate the long term effect of autoinflation on reducing the need for grommet insertion. To our knowledge this has not previously been done.

MATERIAL AND METHOD

During the period, March 1993 to January 1994, 80 patients (93 ears) were diagnosed as secretory otitis media (SOM) in Ankara Numune Hospital 2nd ENT Clinic. Thirty-two were male and 28 female. The mean age were 6.2 years, range 4 to 10 years.

Diagnosis of SOM was established by the typical appearance of the tympanic membrane at the Otoscopic examination and a type B tympanogram (flat curve with no impedance minimum). When fulfilling both criteria the children were randomised to either an autoinflation group inflating the nasal balloon (Otovent®) or into a control group treated with a decongestant nasal spray Clemastin®.

The autoinflation group comprises 30 patients (48 ears, 12 unilateral and 18 bilateral) who could inflate the nasal balloon. the children were instructed to perform autoinflation three times a day for 6 weeks. In case of upper respiratory tract infection with purulent nasal discharge, the patient was advised not to autoinflate.

The control group comprises 30 patients (45 ears, 15 unilateral and 15 bilateral). The children were treated with Clemastin® o.5 mg b.i.d. also for 6 weeks.

The patients in both groups were examined once every two weeks for the first two months and then once a month untill 9 months after entry. There was no difference in the age and sex distribution between the two groups.

Technique using Otovent:

1. The balloon is attached to the nose-piece (figure1).
2. The ball-shape-end of the tube is held airtight to one nostril, the opposite nostril is compressed with a finger and with the mouth closed the balloon is inflated through the nose to the size of an orange. (figure 2).

RESULTS

Follow up on the progress of the autoinflation and the control group over the period of 6 weeks, 3 months, 6 months and 9 months is shown in table l and table 2.

Autoinflation group: After 6 weeks of treatment, effusion had cleared in 27 out of 48 ears (56%). Six weeks after treatment 52% were effusion free. At the six month control, 2 ears were lost at follow up, but 24 out of 46 ears (52%) were effusion free. At the last control 9 months after inclusion, 4 ears were lost at follow up. Twenty four out of 42 ears (57%) were effusion free. Of ears with no improvement, ventilation tubes was inserted in 18 ears after 3 months, and in 2 ears after 6 months. In total 20 out of 48 ears (42%) required ventilation tubes (Table 1 and Table 2).

Control group: After 6 weeks of treatment with Clemastin, effusion had cleared in 14 out of 45 ears (31%). Six weeks after treatment 36% were effusion free. At the six month control, 2 ears were lost at follow up, but 11 out of 43 ears (26%) were effusion free. At the last control 9 months after inclusion, 3 ears were lost at follow up. Eight out of 40 ears (20%) were effusion free. Of ears with no improvement, ventilation tubes was inserted in 28 ears after 3 months, and in 2 ears after 9 months. In total 30 out of 45 ears (67%) required ventilation tubes (Table 2 and Table 3).

DISCUSSION

Secretory otitis media is one of the most common medical problems during childhood (9). It is reported that more than 3.5 Billion dollars are spent annually for the treatment of SOM in the U.S.A (10), Untreated, it may predispose acute otitis media (11), chronic otitis media and

cholesteatoma (9). The mechanic obstruction of the Eustachian tube is suggested to play a role in the aetiology of SOM. Bluestone and Berry (12) reported the mechanical obstruction of Eustachian tube as being the most common cause of Eustachian tube dysfunction in children. The inability of the Eustachian tube to open results in negative middle ear pressure. Persistent tubal obstruction causes middle ear effusion in some children. According to suction-insuffiation theory, positive nasopharyngeal pressure, which acts synergistically to negative middle ear pressure, provides an opening of the Eustachian tube to balance changes of negative pressure in the middle ear (10). Increasing positive pressure in the nasopharynx, which is obtained when inflating Otovent, may help a passive opening of the Eustachian tube. Schwartz et al. (6) reported that SOM could be treated, and middle ear pressure could return to normal, with home politzerisation. Shea (5) suggested the tubal lumen was narrow and the tubal orifice was encircled by glandular structures, and because of poorly developed muscles and the low position of the nasopharyngeal roof, tubal function was impaired until the age of 7 years. Stangerup et al. (7) showed the efficacy of autoinflation treatment of SOM, where 52% was cleared from effusion after two weeks of autoinflation.

In respect to the need for ventilation tubes during the follow up for 3, 6 and 9 months, it is apparent that the autoinflation group required significantly ($p<0.05$) fewer ventilation tubes than the group treated with decongestants. That recurrence of SOM occurred in 7 patients in the Otovent group, but cleared after a second treatment underlines the need of regular follow up of these patients.

The role of elasticity of the tympanic membrane and gas exchange on the balance of middle ear pressure is known (13). It is apparent that the mechanical opening of the Eustachian tube with Otovent cannot solve the problem in all patients with SOM. If the Eustachian tube pathology is the major problem, autoinflation seems beneficial. It is suggested that a middle ear pressure of

-200 mm water can not remain for a long time without development of transudation. Chronic Eustachian tube dysfunction, without the development of SOM, causing a long lasting negative middle ear pressure, can cause loss of elastic fibres of the tympanic membrane, and as a result, development of retraction, atelectasis and cholesteatoma,

Otovent makes house politzeration fun for the child and contributes to the therapy. With more common use of Otovent on patients with SOM and Eustachian tube dysfunction, we will have more information about the optimal number of applications daily during the disease period. In addition we believe that autoinflation will reduce the need for ventilation tubes

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