Rhinology, 25, 63-67, 1987

Rhinomanometry at selection for adenoidectomy

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SUMMARY

The effect of adenoidectomy in 90 consecutive children was related to nasal obstruction preoperatively in order to improve selection for the operation. Nasal airway resistance was evaluated by anterior rhinomanometry. The adenoidectomy had the best effect on the children with highest nasal airway resistance, after nasal decongestants.

Rhinomanometry was found to be a useful method for the selection of children for adenoidectomy.

INTRODUCTION

Many children are subjected to adenoidectomy every year, notwithstanding the fact that many of them do not seem to have any benefit from the intervention (Shaikh et al., 1976; Blum and Neel, 1983). For year the indications for adenoidectomy have been debated. Most authors agree that symptoms of an enlarged adenoid are still indication for operation, but the procedure has no effect on the frequency of common colds and otitis media (Rynnel-Dagöö et al., 1978; Sörensen et al., 1980; Blum and Neel, 1983). The estimation of the enlargement of the adenoid is poorly correlated to the physical signs at posterior rhinoscopy and clinical examination is sometimes unsatisfactory, due to the insufficient co-operation of the child (Hibbert et al., 1980). The parents' description of symptoms like nasal stuffiness, snoring and hyponasality will thus determine the indication of the operation. This may explain why results are frequently unsatisfactory.

In a pilot study we found that radiographic examination, judgement of the voice, screening of immunoglobulins and allergy were not found to be useful methods for the selection of children for adenoidectomy. Rhinomanometry, however, seemed to be an indicator for the children who benefitted from the operation. The aim of the present study was to test rhinomanometry as a method for a safer selection of children for adenoidectomy.

Paper presented at the 11th Congress of the European Rhinologic Society and 5th ISIAN, Athens (Greece), June 1986.

MATERIAL AND METHOD

90 consecutive children, 53 girls and 37 boys between 1.6 and 12.9 years old, mean age 6.2 years, participated in this study. The distribution of age is presented in Figure 1. They were scheduled for adenoidectomy according to the criteria of the ENT-clinic, namely nasal stuffiness, snoring and hyponasality.

The parents of the children were interviewed, one month pre- and one month postoperatively, concerning symptoms of snoring, mouth-breathing and unclear speech. Length and weight were noted. Based on the parents' answers, the effect of the operation was judged from 0–10, where 0 represented no improvement and 10 total relief of all symptoms. Responders were classified as a score of at least 5. All operations were performed by use of adenoid curettes under general intubation anesthesia.

Rhinomanometry was performed after 30 min at rest in a sitting position, and then 15 min after administration of nasal decongestants (oxymetazoline 0.25 mg/ml). The nasal airway resistance (NAR) was investigated by anterior active rhinomanometry (Mercury, No. 1, computer ABC 80, Luxor). According to the Committee on Standardization of Rhinomanometry (Clement, 1984), NAR was expressed as an angle V_2 (Broms et al., 1982) for the total nose. NAR could also be expressed in R_2 (Pascal/cm^3/s). $R_2 = 0.5^*$ tg V_2 for the total nose. Increased value of V_2 indicates an increase of NAR.

Mann-Whitney U-test was used for the statistical analyses.

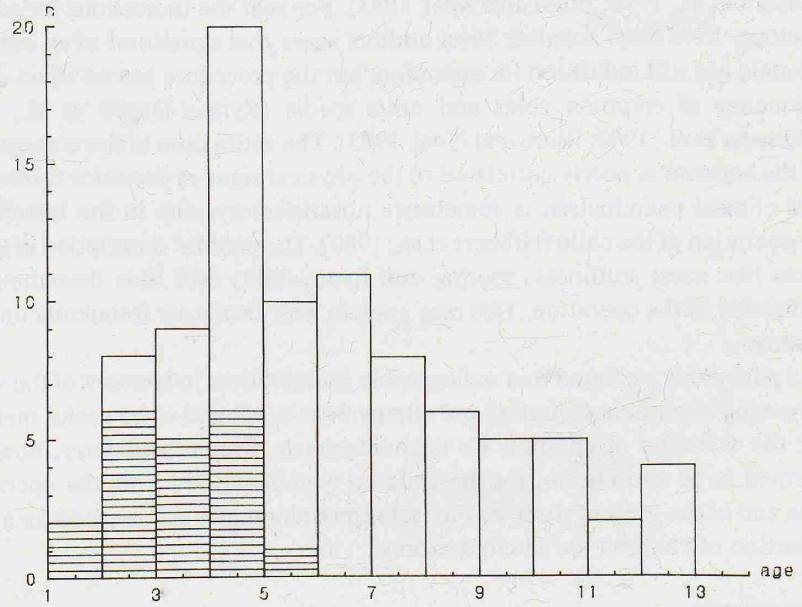

Figure 1. The distribution of age of 90 children. The children wo did not participate in the rhinomanometry measurements are marked.

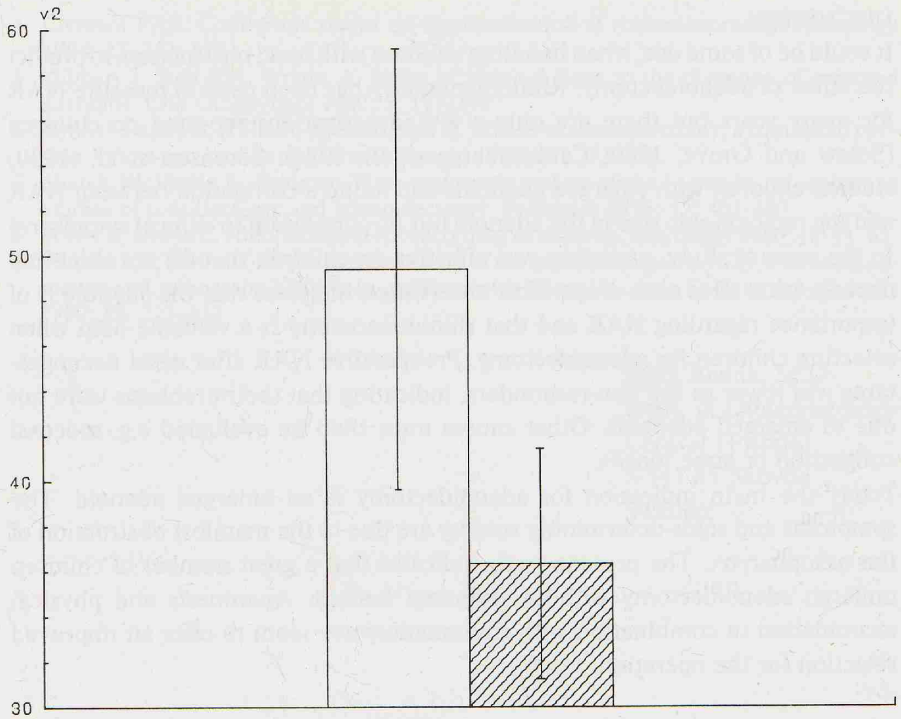

Figure 2. Nasal airway resistance (mean $\pm$ SD) expressed in V_2 after decongestion in relation to the results of adenoidectomy, responders ($n = 56$) and non-responders ($n = 14$), respectively.

RESULTS

Out of 90 children, 73 responded well to adenoidectomy. There were no statistically significant differences in age or sex regarding responders and non-responders.

Twenty children (range 1.6–5.7 years, mean age 3.4 years) did not co-operate in the rhinomanometry measurements. The distribution of age is seen in Figure 1. Of them 17 where classified as responders and 3 as non-responders.

Rhinomanometry was performed in 70 children. The age of these children was mean 7.0 years (range 2.3–12.9 years). Out of these 70 children 56 were responders and 14 non-responders.

NAR expressed in V_2 (mean $\pm$ SE) after 30 min at rest was 61 ± 3 ($R_2 = 0.90$) in responders ($n = 56$) and 59 ± 6 ($R_2 = 0.83$) in non-responders ($n = 14$). The difference is not statistically significant ($p > 0.5$). However, after decongestion NAR was 49 ± 2 ($R_2 = 0.58$) and 36 ± 3 ($R_2 = 0.36$) for responders and non-responders, respectively, and this difference is statistically significant ($p < 0.05$) (Figure 2).

DISCUSSION

It could be of some use, when handling children with nasal obstruction, to predict the effect of adenoidectomy. Rhinomanometry has been used to measure NAR for many years but there are only a few investigations reported on children (Solow and Greve, 1980; Cauwenberge et al., 1984). Sörensen et al. (1980) studied children with enlarged adenoids and found a correlation between NAR and the radiographic size of the adenoid but no correlation to clinical symptoms. In the present study, operation was effective on children that dit not show any decongestion after nose-drops. This observation indicates that the adenoid is of importance regarding NAR and that rhinomanometry is a valuable help when selecting children for adenoidectomy. Preoperative NAR after nasal decongestants was lower in the non-responders, indicating that their problems were not due to enlarged adenoids. Other causes must then be evaluated e.g. mucosal congestion or large tonsils.

Today the main indication for adenoidectomy is an enlarged adenoid. The symptoms and signs determining surgery are due to the manifest obstruction of the nasopharynx. The present study indicates that a great number of children undergo adenoidectomy without sufficient benefit. Anamnesis and physical examination in combination with rhinomanometry seem to offer an improved selection for the operation.

RÉSUMÉ

Afin d'en améliorer l'indication opératiore, les résultats de l'adénoidectomie sont comparés au degré préopératoire d'obstruction nasale dans un matériel non sélectionné de 90 enfants. La résistance des voies aériennes supérieures est évaluée à l'aide d'une rhinomanométrie antérieure. L'adénoidectomie s'avère donner les meilleurs résultats chez les enfants ayant un degré élevé des résistance des voies aériennes supérieures, après traitement décongestionnant nasal préalable. On peut en conclure que la rhinomanométrie apporte une aide appréciable dans le choix de l'indication opératoire de l'adénoidectomie chez l'enfant.

ACKNOWLEDGEMENT

This investigation was supported by grants form LEO Ltd Research Foundation.

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