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F. EYAL, C. MAAYAN, AND S. GODFREY
Department of Pediatrics, Hadassah University Hospital, Mount Scopus, Jerusalem, Israel

Correspondence to Professor S. Godfrey.

Adenoidectomy

An evaluation of the indications

For over 100 years it has been accepted that the symptoms associated with disease of the adenoids are: nasal obstruction with mouth breathing, snoring, recurrent earache, anterior and posterior nasal discharge, cough, and speech defect (Meyer, 1870).

Many authorities feel that these symptoms are due to simple hypertrophy of the adenoids; in *Gray's Anatomy* it is stated that overgrowth of the adenoid obstructs respiration through the nose and results in mouth breathing, and causes deafness by blocking the eustachian tube (Davies and Davies, 1962). A statistical correlation has been shown between the size of the adenoid (ascertained by clinical examination) and the presence of fluid in the ear in a group of children (Murray *et al.*, 1968).

However, Mawson (1971) postulates that hypertrophy of the adenoid causes only recurrent earache, mouth breathing, and snoring, and that the other symptoms are due to chronic adenoiditis. Others have stated that the concept of an infected adenoid is incorrect, that the symptoms are due to hyperplasia alone, and that septic foci have not often been shown histologically in the adenoid (Guida, 1930; Lemere, 1932; Osborne and Roydhouse, 1976).

A random survey of ENT surgeons (Hibbert, 1977) showed that 80% felt that a history from the mother of nasal obstruction and snoring was important in the diagnosis of enlarged adenoids. 75% of surgeons considered that it was the size of the adenoid which caused the symptoms.

The purpose of the present study was to investigate the relation between the signs and symptoms usually attributed to adenoid hypertrophy and the actual size of the adenoid removed at surgery.

Material and method

76 children were chosen consecutively from the waiting list. There were 50 boys (median age 6 years 9 months; range 2 years 11 months-10 years 9 months) and 26 girls (median age 7 years 6 months; range 4 years 10 months-10 years 10 months). The parents of the children were interviewed by one of us (J.H.) and asked about symptoms. The child was then examined for mouth breathing, abnormality on anterior rhinoscopy, and serous otitis media. The presence of a symptom or sign was scored as +1. No attempt was made to differentiate between degrees of any sign or symptom. The adenoids were then removed (by J.H.) using a standard technique and washed, dried, and weighed.

Analysis of the data. The results were arranged in order of increasing weights of adenoids and then divided into 4 groups by quartiles. The number of positive scores for each sign and symptom was noted for each of these groups. The data were submitted to a χ^2 test to determine if the total number of positive scores increased with increasing size of adenoids. Each symptom and sign was tested separately to assess whether there was a correlation between scores and increasing size.

The randomness of distribution of the scores was also assessed by the theory of runs using the data arranged in order of weight of the adenoids.

The weight of the adenoid may vary with age and thus interfere with the distribution of the symptoms against the weight. Therefore regression of the adenoidal weight against age was done by the least squares method (using $\log_{10}$ weight since the weight of the adenoid follows a log normal distribution (Hibbert, 1978)).

Results

The incidence of the various symptoms and signs is shown in the Table, divided by quartiles according to weight of the adenoid. Increasing frequency of scores with increasing weight was recorded for snoring only ($\chi^2=9.32$, 3 d.f., $P<0.05$). The results for the remaining observations were non-significant. In addition a χ^2 test for trend showed that there was significant regression for the snoring group ($\chi^2_1=7.97$, 2 d.f., $P<0.05$).

The number of runs for any of the symptoms and signs did not show a significant deviation from randomness.

There was no correlation between the log weight and the age ($r=-0.06$, $t=0.52$, 74 d.f.). Age dependent variation in weight was thus excluded as a factor interfering with a random distribution.

Table Symptoms and signs—number of positive scores

Quartile*	Nasal obstruction	Snoring	Rhinorrhoea	Cough	Speech defect	Abnormality on anterior rhinoscopy	Mouth breathing	Serous otitis
1	14	12	3	5	11	1	5	7
2	10	12	3	3	7	3	7	8
3	12	17	7	4	10	3	9	8
4	13	18	3	2	12	6	9	11
χ^2	2.01 3 d.f. NS	9.32 3 d.f. $P < 0.05$	0.71† 1 d.f. NS	0.09† 1 d.f. NS	2.95 3 d.f. NS	1.42† 1 d.f. NS	2.43 3 d.f. NS	1.92 3 d.f. NS
χ_1^2		7.97 2 d.f. $P < 0.05$						
χ_2^2		1.35 1 d.f. NS						

*19 children in each quartile.

†With Yates's correction.

Discussion

In this series there was little correlation between the size of the adenoid and the symptoms and signs usually attributed to adenoidal hypertrophy. Assuming that this series is representative of children referred for adenoidectomy there appear to be 3 possible interpretations of our findings: (1) the symptoms and signs are due, not to the absolute size of the adenoid, but to its size relative to the size of the postnasal space (Adair-Dighton, 1912). It has been shown however that the reduction in size of the nasopharyngeal airway correlates very closely to the size of the adenoid (Hibbert, 1978). The absolute size of the nasopharynx is therefore probably not relevant. (2) The symptoms and signs are not due to hypertrophy but to chronic infection of the adenoid. However, chronic infection has only on rare occasions been demonstrated histologically; furthermore, a preliminary pilot study performed by us has shown reactive hyperplasia in the adenoid with evidence of inflammation only on the surface. (3) The symptoms and signs usually attributed to adenoidal hypertrophy are due to some other factor and are not related to the adenoid.

Summary

A group of 76 children who had been listed for adenoidectomy was investigated by scoring the symptoms and signs usually attributed to adenoidal hypertrophy, and removing the adenoids and weighing them. With the possible exception of snoring there was no correlation between the size of the adenoids and the symptoms usually attributed to hypertrophy of this organ.

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J. HIBBERT AND P. STELL

Department of Otolaryngology, University of Liverpool

Correspondence to P. M. Stell, ChM, FRCS, Department of Otolaryngology, Royal Liverpool Hospital, Prescot Street, Liverpool.