

TONSILLECTOMY: A REAPPRAISAL OF ITS ROLE IN THE PROPHYLAXIS OF FIRST ATTACKS OF RHEUMATIC FEVER AND ACUTE GLOMERULAR NEPHRITIS*

M. NISSENBAUM, M.B., CH.B., B.Sc. (ENG.), Johannesburg

SUMMARY

A survey was carried out to investigate the role of tonsillectomy in the prevention of first attacks of rheumatic fever and acute glomerular nephritis. The conclusion is that tonsillectomy carried out after giving due consideration to age, family history and history of recurrent tonsillitis, may provide an effective method for the prevention of first attacks of rheumatic fever.

The value of tonsillectomy in the treatment or prophylaxis of rheumatic fever and acute glomerular nephritis has been the subject of dispute for many years.¹ Most modern textbooks^{2,3} do not even include these conditions in their lists of indications for tonsillectomy. In the past, the claims made for the value of tonsillectomy in their management have either not been fully substantiated or have even been disproved.¹

The majority of tonsillectomies in children are at present performed for: (i) recurrent tonsillitis with chronic anterior cervical lymphadenopathy, and (ii) chronic tonsils (crypts filled with debris) with malaise, poor appetite and failure to thrive. And it is interesting that even these indications give rise to debate and dispute; especially with regard to their interpretation.⁴

The advent of penicillin and other antibiotics has practically eliminated the development of the suppurative or immediate complications of streptococcal tonsillitis.⁵ However, the later complications of tonsillitis caused by the β -haemolytic streptococcus Lancefield group A pose a great threat—the development of non-suppurative sequelae: rheumatic fever and acute glomerular nephritis.^{1,6} The treatment of streptococcal tonsillitis with penicillin has been found extremely effective in preventing rheumatic fever as a complication.⁷ Even if commenced 5-9 days after the start of the tonsillitis, this treatment is effective.⁸ But antibiotic therapy cannot be completely efficient because many first attacks of rheumatic fever follow sub-clinical streptococcal throat infections which obviously do not present for treatment.

Many surveys have been carried out to determine the possibility of a correlation between the presence of tonsils and a susceptibility to rheumatic fever and acute glomerular nephritis; all give conflicting results. In acute glomerular nephritis, tonsillectomy has been shown to be of no value in the prevention of first attacks, recurrences, or in treatment.⁹ In rheumatic fever, it has proved valueless in treatment or prevention of recurrences.⁹⁻¹² As far as first attacks of rheumatic fever are concerned, the literature is even more controversial; some results indicating a favourable influence,¹³ while others¹⁴ show no statistically significant improvement and conclude that tonsillectomy is of no value.

In view of the debatable indications for tonsillectomy, and in particular its possible value in the prophylaxis of first attacks of rheumatic fever and acute glomerular nephritis, this study was undertaken.

METHOD AND MATERIAL

To obtain a measurement of the tonsillectomy rate in the general school population the following survey was carried out:

Three primary and 3 high schools were approached. The teachers were requested to ask their pupils whether they had had a tonsillectomy. A total of 4700 children were questioned. The figures thus depend on the reliability of answers given by the children.

Information was then obtained from the records of the Transvaal Memorial Hospital for Children, in Johannesburg. Every bed-letter covering admissions for rheumatic fever and acute glomerular nephritis from 1963 to 1969 was examined, the following criteria being adopted for inclusion of cases:

1. Final diagnosis marked on bed-letter as accepted by the physician in charge.
2. Unequivocal information regarding the presence or absence of tonsils. Notes were also made of throat swab results, family history of rheumatic fever and acute glomerular nephritis and ASO titre levels.

The above investigations yielded 2 separate groups of children with known tonsillectomy rates. These 2 groups were then compared statistically with the general population survey of schoolchildren.

RESULTS

General Survey

Tonsillectomy rates in 4700 school children were obtained and tabulated according to age (Table I). Forty per cent of schoolchildren had had a tonsillectomy by the age of 15 years.

A total of 229 cases of rheumatic fever were found of which 93 fulfilled the criteria laid down for inclusion in the study and 190 cases of acute glomerular nephritis were found of which 58 were included.

Table I was drawn up as follows: The children were divided into average age groups as found in the schools. In each group the figures for the total (T), the number with tonsils absent (A), and the percentage with tonsils absent ($AT \times 100$) were tabulated. The values in the rows marked 'observed', refer to tonsillectomy rates in each group obtained from bed-letters.

Expected values were calculated as follows: The total number (T) in any particular age group was multiplied by the tonsillectomy % value in the corresponding age group from the general survey. Figures for ages 5 years or less were included for interest, but not in the calculations for significance testing because expected values in this age group were unknown. The results comparing tonsillectomy rates in the groups under discussion were tested for significance by both X^2 and approximate binomial methods.

Rheumatic Fever Group

There is a highly significant positive statistical correlation between the presence of the tonsils and susceptibility to first attacks,

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TABLE I. THE INCIDENCE OF TONSILLECTOMY IN CHILDREN AGED 5-15 YEARS WHO HAVE HAD EITHER RHEUMATIC FEVER AND ACUTE GLOMERULAR NEPHRITIS COMPARED WITH THE INCIDENCE OF TONSILLECTOMY IN THE GENERAL POPULATION SURVEYED IN THIS AGE GROUP

Average age in years	T (Total in group) A (No. with tonsils absent)	General Survey		Rheumatic fever		Acute glomerular nephritis	
		Totals	% with tonsils absent	Observed	Expected	Observed	Expected
<5	T			7		31	
	A			0		0	
5	T			11		12	
	A			1		2	
6	T	348		9	9	10	10
	A	94	27	0	2.4	2	2.7
7	T	346		14	14	16	16
	A	117	34	2	4.8	5	5.4
8	T	350		11	11	4	4
	A	133	38	0	4.2	1	1.5
9	T	389		14	14	9	9
	A	142	37	2	5.2	3	3.3
10	T	372		8	8	6	6
	A	150	40	0	3.2	0	2.4
11	T	399		12	12	5	5
	A	156	39	1	4.7	3	2
12	T	371		12	12	3	3
	A	148	40	2	4.8	2	1.2
13	T	645		9	9	5	5
	A	278	43	2	3.9	1	2.2
14	T	529		4	4		
	A	239	45	2	1.8		
≥15	T	977					
	A	394	40				
Totals	T	4 726		93	93	58	58
	A	1 855	39	11	35	17	20.7
	% Tonsils absent			11.8	37.7	29.3	35.7

A significant hereditary or familial predisposition was found. Twenty percent of patients in the survey gave a family history. Blood relations included were siblings, parents, grandparents, uncles and aunts. In 21 patients giving a family history, only 1 patient, aged 13 years, had had a previous tonsillectomy.

Acute Glomerular Nephritis Group

An association between the presence of the tonsils and susceptibility to first attacks was found, but it was not statistically significant.

No significant family history was found.

DISCUSSION

This survey seems to indicate that tonsillectomy may play a significant role in the prevention of first attacks of rheumatic fever. However, since the incidence of rheumatic fever is low, indiscriminate tonsillectomy for its prophylaxis cannot be advocated. Other associated factors—age, recurrent tonsillitis, plus a significant family tendency to rheumatic fever—should also be taken into account. It would appear that in children aged 4 years or more, with two or more attacks of tonsillitis per year, judged clinically,

and with a significant family history of rheumatic fever, a sufficient indication for tonsillectomy exists. The operation should be performed under full penicillin-cover, and result in the complete removal of the tonsils.

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REFERENCES

1. Peacock, P. N. B. (1957): 'Epidemiology and prevention of rheumatic fever', M.D. thesis, University of the Witwatersrand.
2. Nelson, W. E. (1964): *Textbook of Pediatrics*, 9th ed., p. 895. Philadelphia: W. B. Saunders.
3. Rendle-Short, J. (1957): *Synopsis of Children's Diseases*, 2nd ed., p. 151. Baltimore: Williams and Wilkins.
4. Illingworth, R. S., Hadfield, E. H., and Macbeth, R. G. (1950): *J. Laryng.*, **64**, 580.
5. Chamowitz, R., Rammelkamp, C. H., Wannamaker, L. W., and Denny, F. W. (1960): *Pediatrics*, **26**, 355.
6. Illingworth, R. S. (1939): *Lancet*, **2**, 1013.
7. Bywaters, E. G. L. (1956): *Ibid.*, **2**, 989.
8. Markowitz, M. and Kuttner, A. G. (1965): In *Major Problems in Clinical Pediatrics*, vol. 2, p. 139. Philadelphia: W. B. Saunders.
9. Finland, M., Robey, W. H. and Heimann, H. (1933): *Amer. Heart J.*, **8**, 343.
10. Sheldon, W. (1931): *Lancet*, **1**, 1337.
11. Bradford, W. L. (1942): *Amer. J. Dis. Child.*, **44**, 279.
12. Allan, W. B. and Baylor, J. W. (1938): *Bull. Johns Hopk. Hosp.*, **63**, 111.