A two-year follow-up observational study of the T-14 paediatric throat disorders outcome measure in tonsillectomy and adenotonsillectomy

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ABSTRACT

INTRODUCTION The T-14 questionnaire is a validated patient reported outcome measure used to assess the value of paediatric tonsillectomy from the patient's perspective. There are currently limited data revealing the long-term postoperative effects of tonsillectomy on quality of life in the paediatric population. A previously published study was therefore extended to provide additional data at 12 and 24 months following surgery.

METHODS A prospective uncontrolled observational study was undertaken examining 54 paediatric patients undergoing tonsillectomy at Portsmouth Hospitals NHS Trust. Parents of children having surgery were invited to complete a T-14 questionnaire preoperatively as well as at 3, 6 (previously published), 12 and 24 months postoperatively.

RESULTS The questionnaire was completed for 50 of the 54 patients preoperatively as well as at 3, 6 and 12 months postoperatively, with 44 being completed at 24 months. The mean difference between the preoperative T-14 scores and the scores at 3, 6, 12 and 24 months following surgery were highly statistically significant ($p < 0.001$).

CONCLUSIONS This is the first study published in the literature to assess the T-14 questionnaire at 12 and 24 months following paediatric tonsillectomy, providing evidence of the ongoing benefit of patient reported outcome measures. This further confirms the value of tonsillectomy in the paediatric population and demonstrates its ongoing positive effects on quality of life.

KEYWORDS

Tonsillectomy – Adenotonsillectomy – T-14 – Outcome – Paediatric – Throat

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With the National Health Service (NHS) under intense financial pressure, many procedures that lack good quality evidence of clinical improvements face potential restriction. In 2009 the Department of Health commissioned McKinsey & Company (a global consulting firm) to examine the spending practices of the NHS and advise the UK government on future spending reductions.¹ This report identified tonsillectomy as a 'relatively ineffective' intervention, suggesting that it could be reduced by 10–90%, resulting in a maximum saving of £45 million. As a result, funding for this procedure is now only granted through individual applications to regional NHS funding bodies, undertaken on a case-by-case basis. In order to prevent further restrictions, good postoperative evidence for tonsillectomy outcomes is required.

In September 2013 we published the findings of the first study to examine paediatric throat disorders outcome measure (T-14) questionnaires, preoperatively as well as at 3 and 6 months postoperatively.² The T-14 questionnaire assesses patient reported symptom scores for tonsillitis and/or obstructive sleep apnoea (OSA), and it is a validated

patient reported outcome measure.^{3,4} Our previous paper revealed the overwhelmingly positive effects of tonsillectomy within 3–6 months of the procedure.² However, data regarding longer-term outcomes are limited and the study was therefore extended up to 24 months.

This study aimed to provide further evidence supporting the role of tonsillectomy in the management of recurrent tonsillitis and/or OSA, measured over a 24-month period. It is the first published study to assess T-14 scores at 12 and 24 months following surgery, providing additional evidence of the ongoing clinical benefit following paediatric tonsillectomy.

Methods

A prospective uncontrolled observational study was undertaken examining 54 consecutive paediatric patients undergoing tonsillectomy at Portsmouth Hospitals NHS Trust from 10 March 2012, with telephone follow-up surveys conducted until 19 June 2014. Children (under 16 years old) were considered eligible if they were undergoing

Considering how severe the problem is when your child experiences it and how often it has happened over the past 6 months for your child, please rate each item below on how 'bad' it is by circling the number that corresponds with how you feel using this scale. If a certain question is not a problem for your child, please circle '0'. Please try not to miss any questions.	No problem	Very mild problem	Mild or slight problem	Moderate problem	Severe problem	Problem as bad as it could be
1. Snoring loudly during sleep	0	1	2	3	4	5
2. Irregular or stopped breathing (apnoea) during sleep	0	1	2	3	4	5
3. Daytime sleepiness	0	1	2	3	4	5
4. Noisy breathing during the day	0	1	2	3	4	5
5. Breathing through the mouth during the day	0	1	2	3	4	5
6. Problems with poor appetite or poor eating habits (choking on food etc)	0	1	2	3	4	5
7. Frequent earache or ear infections	0	1	2	3	4	5
8. Repeated short-term throat infections that last less than 2 weeks	0	1	2	3	4	5
9. Constant or chronic throat infections that last more than 2 weeks	0	1	2	3	4	5
10. Many phone calls to the doctor or NHS Direct	0	1	2	3	4	5
11. Many visits to the family doctor or A&E department	0	1	2	3	4	5
12. Taking antibiotics over and over for less than 2 weeks at a time	0	1	2	3	4	5
13. Taking antibiotics for more than 2 weeks straight	0	1	2	3	4	5
14. Missing school days due to sore throats	0	1	2	3	4	5

Please enter any further important symptoms that occur as a result of your child's throat problems that we have missed from the list above and give each a rating from 0 to 5 like the ones already listed:

Figure 1 Paediatric throat disorders outcome measure (T-14) for tonsillectomy and adenotonsillectomy

tonsillectomy, within the study dates, for either recurrent tonsillitis, as defined by the Scottish Intercollegiate Guidelines Network criteria,⁵ and/or OSA. The parents of children undergoing surgery were invited to complete a T-14 questionnaire preoperatively (Fig 1) as well as 3, 6, 12 and 24 months postoperatively. Preoperative scores were collected on the day of surgery, with parents contacted by the first author (KK) to complete questionnaires at all postoperative timepoints.

Statistical analysis

As previously published,² a power calculation was undertaken using the results of the T-14 validation study conducted by Hopkins *et al.*⁴ The number of patients recruited resulted in a highly powered study (>90%). Data were collated and analysed using Excel® (Microsoft, Redmond, WA, US) with statistical analysis performed in SPSS® version 20 (IBM, New York, US) using an independent samples t-test. Statistical significance was achieved at a *p*-value of <0.05.

Results

A total of 54 patients (25 male, 29 female, age range: 2–15 years, mean age: 6 years) were included in the study. The parents of all 54 patients completed the preoperative and 3-month postoperative questionnaires, with 52 patients studied at 6 months, 50 patients at 12 months and 44 patients at 24 months. This gave an overall response rate of 81%.

Tonsillectomy was performed in 25 patients and adenotonsillectomy in 29. The indications for tonsillectomy included 19 patients with recurrent tonsillitis, 13 with OSA and 15 with both symptoms.

Table 1 highlights the preoperative, 3, 6, 12 and 24-month T-14 scores. There was a highly significant reduction when comparing the preoperative T-14 score to the scores at 3, 6, 12 and 24 months postoperatively (*p*<0.001). As published previously,² T-14 scores reduced significantly from 3 to 6 months (*p*=0.04). However, this follow-up study has revealed no significant change from 6 to 12 or 12 to 24 months (*p*>0.05).

Table 1 T-14 scores preoperatively as well as at 3, 6, 12 and 24 months postoperatively

	Patients	Mean score	Range	SD	95% CI
Preoperative	54 (100%)	33.3	12–61	13.2	29.7–36.9
3 months	54 (100%)	3.4	0–37	5.7	1.8–5.0
6 months	52 (96%)	1.5	0–18	3.5	0.6–2.5
12 months	50 (93%)	2.1	0–21	4.1	1.0–3.2
24 months	44 (81%)	1.5	0–18	3.4	0.5–2.4

SD = standard deviation; CI = confidence interval

Figure 2 highlights the significant reduction in the T-14 scores from preoperative to 3, 6, 12 and 24 months following surgery. Figure 3 reveals the reduction in the T-14 scores between the following groups: indications for tonsillectomy (recurrent tonsillitis, OSA or both), surgical procedure (tonsillectomy or adenotonsillectomy), age category (5 or >5 years old) and sex. There was no significant difference between any of the groups identified in Figure 3 ($p>0.05$).

Discussion

We have shown previously that T-14 scores reduce significantly following tonsillectomy in the paediatric population, at both 3 and 6 months after surgery.² However, this original study was limited in its follow-up duration. The present study has revealed that the positive effects of tonsillectomy, ascertained through measurement of T-14 scores, continue with a final mean score of 1.5 at 24 months. These data provide important evidence defending the clinical value of tonsillectomy in the paediatric population and this study is the first published in the literature that assesses tonsillectomy quality of life (QoL) scores over a wide range of post-operative timepoints.

Tonsillectomy is a procedure under threat, with widespread limitations over the previous few decades. Indeed, tonsillectomy numbers have reduced by 44% from 1991 to 2011 and as a consequence, admissions due to associated complications have increased across the UK.⁶ Over the same time period, tonsillitis admissions have increased by 310% and peritonsillar abscess cases by 31%. Reductions in the number of tonsillectomies undertaken are likely to be due to improved understandings of which patients

benefit most from this procedure and surgeons now using the best available evidence to refine the indications for surgery.⁷ Nevertheless, with the NHS facing budget restrictions and tonsillectomy specifically highlighted as a procedure of limited clinical benefit, it is important that ongoing clinical evidence of benefit is sought.

There are currently limited studies in the literature evaluating QoL scores following tonsillectomy. The validation study for the T-14 questionnaire undertaken by Hopkins *et al* studied QoL at 6 months following tonsillectomy,⁴ similar to our original study measuring postoperative T-14 scores at 3 and 6 months.² Both studies revealed the highly significant improvement in QoL following tonsillectomy for recurrent infections and/or OSA. On reviewing the literature, there are only a handful of additional studies measuring QoL, not using the T-14 questionnaire. Those assessing QoL for OSA patients are more numerous than those assessing cases with recurrent throat infections.^{8–10} However, none followed up children over a 24-month period. Consequently, the present study is significant in that regard.

As detailed above, the T-14 questionnaire is a useful tool in audit and measurement of QoL following tonsillectomy. Maximum QoL benefits from tonsillectomy were achieved at six months following surgery. Indeed, no statistically significant improvements were measured following this timepoint. As a result, owing to the stability in T-14 scores after six months, clinicians do not need to measure them routinely after this timepoint as it is unlikely there will be any further additional QoL improvement.

Study limitations

The T-14 questionnaire assesses QoL and symptom reported patient scores from the perspective of the patient's legal guardian. As a result, bias is likely to be a limiting factor owing to the subjective and indirect way in which these scores are obtained. This study did not include a control group. As a result, it was not possible to assess whether QoL would improve without the requirement for surgery.

Conclusions

Collection of good quality evidence pertaining to the improvements in QoL following paediatric tonsillectomy is of paramount importance, especially as there is a deficit of long-term follow-up studies in the literature. This study has revealed good ongoing QoL scores for up to 24 months following surgery in patients undergoing tonsillectomy for recurrent infections and/or OSA. Tonsillectomy is the most common surgical procedure performed in the UK, and it is highly regarded by patients and otolaryngologists alike. This study provides significant evidence that tonsillectomy improves patient reported outcome measures, thereby demonstrating its ongoing clinical value as a funded NHS procedure.

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