



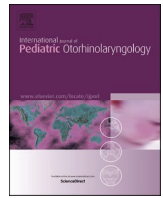
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# Recurrent tonsillitis and parental perceptions of tonsillectomy during the COVID-19 pandemic

Elliot Heward<sup>\*</sup>, John Rocke, Nirmal Kumar, Steve Izzat

Royal Albert Edward Infirmary, Wigan, United Kingdom

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## ABSTRACT

**Objectives:** The coronavirus outbreak has triggered the implementation of nationwide social distancing measures. We aimed to investigate the impact on patients with recurrent tonsillitis and parental perceptions towards tonsillectomy during the COVID-19 pandemic.

**Methods:** A telephone questionnaire was conducted for all children awaiting tonsillectomy for recurrent tonsillitis after social distancing for 2 months at our centre. The COVID-19 lockdown period was compared with the 2 months prior to lockdown.

**Results:** Forty-four children had been social distancing at home during lockdown. There was a significant reduction in tonsillitis episodes during the 2-month lockdown period in comparison with 2 months prior to lockdown ( $p = 0.0001$ ). In 70% ( $n = 31$ ) of cases parents wanted their child's tonsillectomy during the coronavirus outbreak.

**Conclusion:** These findings demonstrate that viral exposure is a key factor in the pathophysiology of recurrent tonsillitis and that social distancing measures can reduce the frequency of recurrent tonsillitis. Despite the overall reduction in tonsillitis frequency during the lockdown period, the majority of parents wanted their child's tonsillectomy during the coronavirus outbreak. This demonstrates the impact tonsillitis has on the patient and their family's quality of life.

## 1. Introduction

The current outbreak of coronavirus (COVID-19) has forced a significant change in the delivery of services throughout the National Health Service (NHS) in the United Kingdom (UK). The majority of elective operations have been deferred to allow increased inpatient capacity for patients with COVID-19, allow surgeons to support critical care delivery and to reduce the risk of cross-infection to protect elective patients, staff and visitors. Postponing elective surgery has led to longer waiting lists in England with the median waiting time to elective treatment in April 2020 at 12.2 weeks compared with 7.2 weeks in April 2019 [1]. This will inevitably affect patients waiting for a tonsillectomy which is the most common elective procedure undertaken in the field of Ear, Nose and Throat (ENT) surgery within the UK. It makes up 17% of the elective workload and costs £68 million per year [2]. The most common indications for tonsillectomy or tonsillotomy are recurrent tonsillitis and Obstructive Sleep Apnoea (OSA) [3].

It has previously been demonstrated that a proportion of the paediatric population with recurrent tonsillitis will recover whilst on the

waiting list for surgery. Prim et al. [4]. found that 18.6% of their patients on their waiting list no longer fulfilled the criteria for tonsillectomy; the average waiting time was 10.8 months. Woolford et al. [5]. contacted patients who had been on their waiting list for longer than 9 months and found that 27% of their paediatric population no longer required tonsillectomy. As such it can be deduced that a proportion of children, with recurrent tonsillitis, will spontaneously resolve over time. It is not known however how to identify this subset of the waiting list accurately.

The pathophysiology of recurrent tonsillitis in children has focussed on the microbiome of the pharynx. Cultivation studies have demonstrated numerous pathogenic bacteria in the pharynx in asymptomatic children and in those with recurrent tonsillitis [6]. Similar studies have demonstrated latent viral reservoirs which also may play a role. It has been shown the Epstein Barr Virus (EBV) is reactivated in astronauts as a result of the stressors of spaceflight and it is understood that the virus' life cycle is regulated by both cellular and viral factors [7]. There is a lack of research surrounding the role that viral load, within the patient's surroundings and how social distancing may affect the pathophysiology of recurrent tonsillitis. The recent COVID-19 outbreak, within the UK,

<sup>\*</sup> Corresponding author. ENT Department, Wigan and Leigh NHS Foundation Trust Wigan Lane, Royal Albert Edward Infirmary, Wroughton, WN1 2NN.  
E-mail address: [ellietheward@doctors.org.uk](mailto:ellietheward@doctors.org.uk) (E. Heward).

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has led to numerous public health measures to reduce human contact. Schools have been shut to the majority of pupils and the population has been advised to keep a distance of 2 m apart unless residing in the same household [8].

Tonsillitis has been shown to have a significant impact on both the child and the family. It results in child discomfort, school absence, family cross infection and parental concern. Howel et al. [9]. showed that 59% (n = 524/888) of parents with children who suffered with tonsillitis were eager and 7% (n = 62/888) were insistent for tonsillectomy. It is not yet known what impact the COVID-19 outbreak will have on parental perceptions of surgery which will affect service provision in the NHS.

We recognised the burden of delayed elective procedures on future resources within Ear, Nose and Throat surgery and as such conducted a service evaluation of our paediatric patients on our waiting list for tonsillectomy to treat recurrent tonsillitis. Our primary aim was to assess if patients were still suffering from recurrent tonsillitis and secondary aim to see if their parents or guardians wished to proceed with the operative intervention in spite of the coronavirus outbreak.

## 2. Materials and methods

This cross-sectional single centre retrospective study surveyed the parents of children ( $\leq 16$  years) on the tonsillectomy waiting list for recurrent tonsillitis 2 months after the coronavirus lockdown. Parents were asked a standardised questionnaire created by the authors prior to study commencement. Duration on waiting list was defined as date listed to May 25, 2020. The Health Research Authority decision tool indicated that no ethics approval was required. The quality improvement project was registered with the local clinical audit department (No. 4673). The coronavirus lockdown period was defined as 23/03/2020–17/05/2020 and 2 months previous to lockdown as 27/01/2020–22/03/2020.

Phone call consultations were performed between 25/05/2020–28/05/2020. Parents were called a second time on a consecutive day if no response after the first call.

Patients were identified from the tonsillectomy waiting list on May 25, 2020 and patient demographics were collected from the electronic health information system. Three children had continued to attend school during the lockdown period so were excluded from the results.

Statistical analysis was performed on GraphPad Prism version 8.0. An unpaired T test was used for comparison of different groups and a paired T test was performed assess the differences in tonsillitis episodes and antibiotic use in the period prior to and during lockdown. Parametric testing was used, and a statistical significance was defined as  $p < 0.05$ . Data is displayed as mean and standard error of the mean (SEM).

## 3. Results

Of the 69 children on the waiting list for tonsillectomy 44 responded and did not attend school or nursery during lockdown. The mean child age at listing was 7.6 years (range 1.9–14.9 years). The cohort contained 20 females and 24 males. The mean number of days on the waiting list was 144.2 days (range 62–279 days) and tonsillitis episodes 12 months prior to lockdown was 8.25 (range 3–18 episodes). All patients met the SIGN criteria for tonsillectomy (Fig. 1) [10]. Four patients had also been diagnosed with concurrent obstructive sleep apnoea, no patients were immunosuppressed, had diabetes or cardiac disease.

The number of tonsillitis episodes experienced during the lockdown 2 months (mean 0.84 SEM 0.17) was significantly less than in the 2 preceding months (mean 1.80 SEM 0.17) ( $p = 0.0001$ ) (Fig. 2). In terms of antibiotic requirement for tonsillitis, there was a significant decrease in patient use from the 2 months prior to lockdown (70% of patients) versus the 2 months of lockdown (32% of patients) ( $p = 0.0002$ ). None of the patients attended hospital during the lockdown period as a result of tonsillitis compared with 4 patients in the prior 2 months. No patients suffered a tonsillitis related complication in either period.

The average number of children per household was 2.3. There was no significant difference in the number of children per household in the cohort of children who suffered with tonsillitis during the lockdown (2.4 per household) compared to those who were tonsillitis free (2.2 per household) ( $p > 0.05$ ).

All parents wanted to go ahead with the tonsillectomy when asked. Parents were asked whether they would like their child's tonsillectomy to be during the COVID-19 outbreak or after the outbreak. Thirty-one parents were happy for their child's tonsillectomy to occur during the COVID-19 outbreak with 13 wanting to postpone until after the outbreak (Fig. 3). The group who elected to delay their procedure until after the outbreak had a significantly lower average number of tonsillitis episodes during the lockdown than the group who wanted surgery during the outbreak (0.08 vs 1.6 episodes respectively,  $p = 0.0001$ ). This was not the case for the 2 month period prior to lockdown ( $p > 0.05$ ) (Fig. 4).

## 4. Discussion

This service evaluation has demonstrated a significant reduction in recurrent tonsillitis in our paediatric patients following the introduction of Public Health measures designed to reduce the spread of COVID-19 [8]. We hypothesise that social distancing and repeated hand washing will have led to reduced viral exposure in this population; which could be the driving factor behind this reduction in recurrent tonsillitis rates. Despite this reduction, 70% of parents wanted to proceed with their

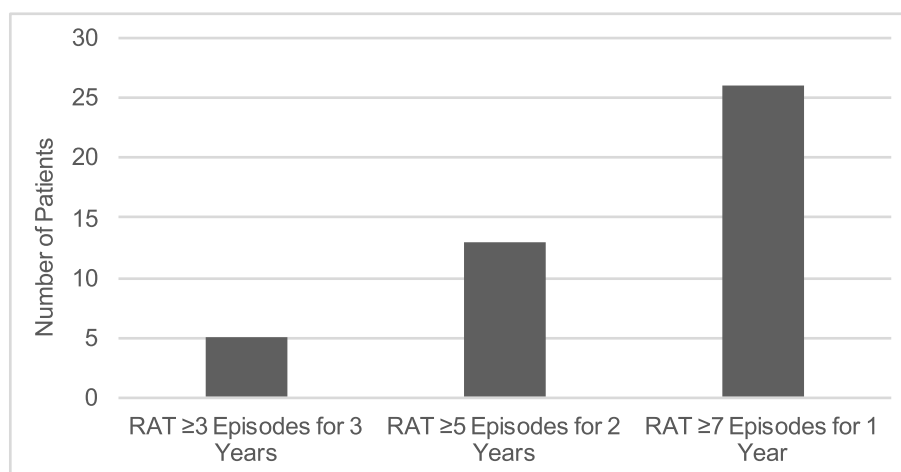


Fig. 1. Indication for tonsillectomy (RAT; Recurrent Acute Tonsillitis).

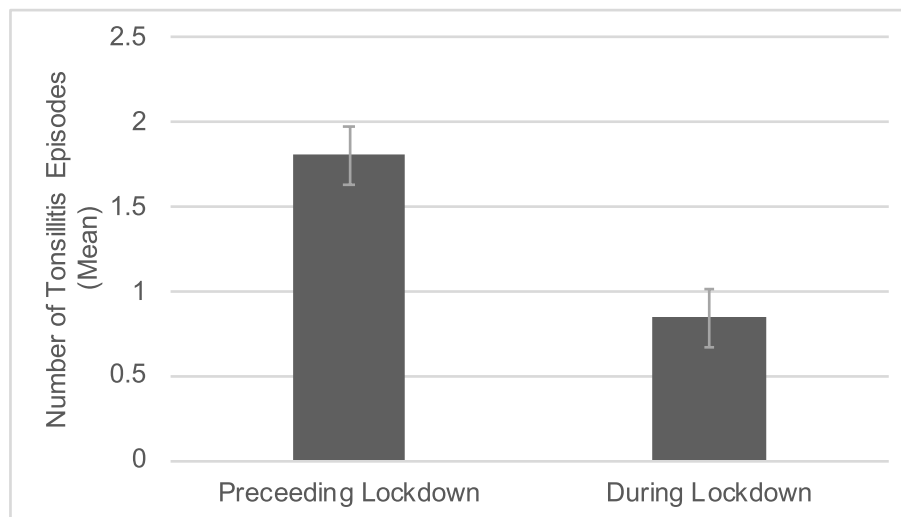


Fig. 2. Mean number of tonsillitis episodes during the 2 months preceding lockdown versus 2 months during lockdown (Error bars: SEM 0.17).

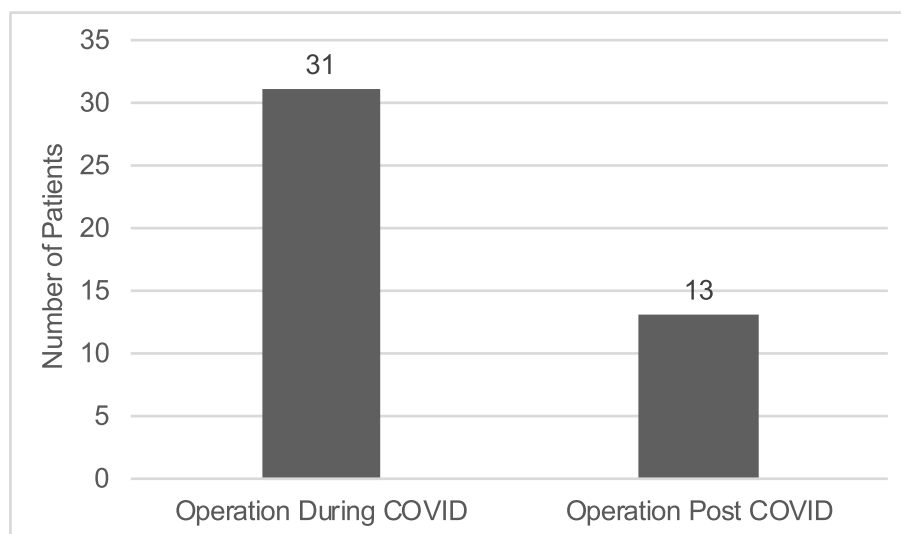


Fig. 3. Parental choice of operation date.

child's tonsillectomy during the COVID-19 outbreak.

In addition to the reduced rate of tonsillitis during the lockdown period, we have demonstrated that antibiotic demand for acute tonsillitis was significantly less and presentations to hospital fell during the lockdown period. The reduced frequency of tonsillitis and public concern regarding hospital attendance during the COVID-19 outbreak may have contributed to these changes.

It could be assumed that families' with more children in the household would have a higher risk of developing tonsillitis due to viral exposure from their siblings during the lockdown period. Howel et al. [9]. demonstrated that 52% (n = 942) of families experience cross-infection within their family related to tonsillitis. Our results have shown that the number of siblings in a household did not increase the risk of developing tonsillitis during lockdown. The lockdown family 'bubble' seems to have limited infection from external sources so preventing transmission between siblings.

Recurrent tonsillitis has been shown to have a significant impact on both the child and the family, with the majority of parents eager for surgical intervention to address this [9]. Despite the reduction in rates of recurrent tonsillitis and the COVID-19 risk all parents and guardians wanted to proceed with tonsillectomy with the majority preferring an

operative date during the COVID-19 outbreak. This demonstrates that tonsillitis has a substantial impact on the child's and parents' quality of life. Interestingly, those who wanted to postpone their operation date until after the COVID-19 outbreak had significantly less episodes of tonsillitis during the lockdown period than those who wanted to proceed during the outbreak (Fig. 4). This likely explains the differing parental decision.

There were however limitations to this study as we compared two subsequent time periods and seasonal variation in tonsillitis rates has been demonstrated previously. This methodology was chosen to improve recall of tonsillitis episodes and achieve a more accurate rate of retrospective data collection. Anecdotally the rates of tonsillitis are thought to increase during the winter months but there is little data to support this. We also know that a proportion of children will recover from episodes of recurrent tonsillitis whilst on the waiting list and this needs to be taken in to account when interpreting our findings [4,5].

## 5. Conclusion

These findings demonstrate that viral exposure is possibly a key factor in the pathophysiology of recurrent tonsillitis and that social

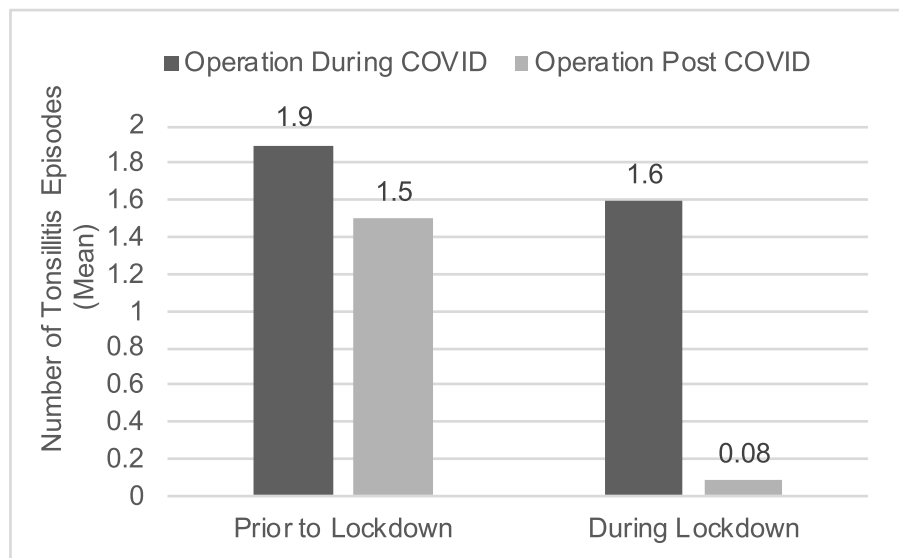


Fig. 4. Difference in parental attitudes to operative date based on frequency of tonsillitis in the 2 months prior to lockdown and 2 months during lockdown.

distancing measures may reduce the frequency of recurrent acute tonsillitis. The majority of parents wanted to proceed with their child's tonsillectomy during the coronavirus outbreak which demonstrates the impact tonsillitis has on the child and their family. These results will help to shape NHS service provision when emerging from the COVID-19 pandemic.

#### Declaration of competing interest

None.

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