

# Operative workload of a paediatric otolaryngology department over a five-year period

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## ABSTRACT

**Introduction:** The KK Women's and Children's Hospital (KKWCH) is Singapore's only tertiary institution dedicated wholly to the provision of healthcare for women and children. Since its opening in 1997, the clinical caseloads and the complexity of medical conditions managed by the various departments has increased considerably. This review aims to analyse the operative caseloads in the Department of Otolaryngology over five years from 2000 to 2004.

**Methods:** This is a retrospective review of the KKWCH Department of Otolaryngology operative records from year 2000 to 2004. The data on the type of operation and their frequency were collated, and the data are presented in a descriptive format.

**Results:** There was an increase in the number of operations performed from 656 in year 2000 to 1,148 in 2004, an increase of 75 percent. The increase in the staffing and operating clinical hours (in 2003 and 2004) plus the significant demand for paediatric otolaryngology service probably contributed to this increase. Tonsillectomy, with or without adenoidectomy, continues to be the most common procedure being performed in children, with myringotomy and tympanostomy tube insertion being the second commonest. Together, the ten most common operative procedures constitute 78.2 percent of all paediatric otolaryngological operative workload in the department over a five-year period.

**Conclusion:** The data provided a review of the current pattern of otolaryngological surgical disease in the Singapore paediatric population, which may require operative intervention. Understanding and monitoring of this trend is important, as it allows the proper allocation of appropriate resources for the prevention and treatment of common paediatric surgical otolaryngological conditions.

**Keywords:** children, operative workload, otolaryngology, tonsillectomy

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## INTRODUCTION

The KK Women's and Children's Hospital (KKWCH) is Singapore's only tertiary institution dedicated wholly to the provision of healthcare for women and children. Since its opening in 1997, the clinical caseloads and the complexity of medical conditions managed by the various departments have increased considerably. The objective of this review is to analyse the operative caseloads in the Department of Otolaryngology over five years from 2000 to 2004. The type and frequency of operative procedures are highlighted, as this possibly reflects the otolaryngological surgical disease pattern amongst Singapore's paediatric population.

## METHODS

This is a retrospective review of the KKWCH Department of Otolaryngology operative records from January 2000 to December 2004 (five-year period). The record books documenting the details of each operative procedure were manually reviewed, and the data on the type of operation and their frequency were collated. This information was then subsequently analysed and presented in a descriptive format.

## RESULTS

Table I shows the number of otolaryngology (ENT) operations performed from the year 2000 to 2004. The operative caseloads were similar from 2000 to 2002. It increased to more than 900 in 2003 and exceeded 1,000 in 2004. This was in part attributed to the increase in the staffing of the department, which in turn led to the corresponding increase in outpatient consultation hours and operating time. Table II shows the ten most frequently-performed ENT operations in the department. Tonsillectomy, with or without adenoidectomy, was the most common procedure being performed in children, with myringotomy

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**Table I: Operative caseloads for KKWCH Department of Otolaryngology from 2000 to 2004.**

Month/year	2000	2001	2002	2003	2004
January	45	39	32	84	96
February	39	49	23	87	67
March	50	68	39	97	143
April	44	33	19	37	89
May	79	69	54	32	90
June	72	98	72	74	125
July	55	37	70	101	93
August	36	49	50	63	95
September	78	53	61	108	102
October	39	58	70	80	69
November	63	56	86	87	68
December	56	50	81	112	111
Total per year	656	659	657	962	1,148
Grand total	4,082				

**Table II: The ten most frequently-performed operating procedures in the KKWCH Department of Otolaryngology from 2000 to 2004.**

Procedure	Frequency	%
1. Tonsillectomy with or without adenoidectomy	949	23.2
2. Myringotomy and tympanostomy tube insertion	752	18.4
3. Examination under anaesthesia (EUA) of ears	415	10.2
4. Examination under anaesthesia (EUA) of nose	266	6.5
5. Microlaryngoscopy and bronchoscopy (MLB)	233	5.7
6. Removal of foreign body from ear	146	3.6
7. Excision of pre-auricular sinus	136	3.3
8. Maxillary antral washout	112	2.7
9. Adenoidectomy only	93	2.3
10. Removal of foreign body from nose	90	2.2

and tympanostomy tube insertion being the second commonest. Together, the ten most common operative procedures constituted 78.2% of all paediatric ENT operative workload in the department over the last five years.

For the examination under anaesthesia (EUA) of the ear cases, these were procedures being performed for suspected hearing loss or otitis media with effusion, which did not involve tympanostomy tube insertion, foreign body or keratosis obturans removal from the ears. If we were to combine all these "minor" ear procedures (which include EUA of the ears, myringotomy and tympanostomy tube insertion, removal of foreign body and removal of keratosis obturans from the ears) into a single category, there

were a total of 1,373 cases (including 60 cases of removal of keratosis obturans from the ears), and this would constitute 33.6% of the total workload.

Similarly, combining EUA of the nose (this is performed for the evaluation of epistaxis or suspected sinusitis in the paediatric population, which usually only involve endoscopic examination with application of electric cautery or biopsy of suspicious lesion), removal of foreign body from nose and maxillary antral washout into the category of "minor" nasal procedure, there were a total of 468 cases (11.5% of total workload). If we consider tonsillectomy and/or adenoidectomy as a single category, there were a total of 1,042 cases (25.5%). Combining these top three categories (i.e. "minor" ear and nasal procedures, with tonsillectomy and/or adenoidectomy), they constituted 70.6% of the total operative workload (Table III).

There were a total of 233 cases of microlaryngoscopy and bronchoscopy (MLB) done during the five-year period (average of 46 cases a year). The vast majority were for the evaluation of stridor in the paediatric population, with only eight cases being done for removal of foreign body in the trachea and/or bronchus. Foreign body found in the rest of the upper aerodigestive tract (UADT) and the ears is a common indication for the operation. In the five-year period, there were a total of 306 (average of 61 cases a year) operations done under general anaesthesia for the removal of foreign body. The breakdown was: ear 146, nose 90, oesophagus 43, oropharynx 19, and tracheobronchial tree eight.

## DISCUSSION

The number of operative procedures was similar from 2000 to 2002. There was an increase of more than 300 cases in 2003, and a further increase in 2004. As mentioned above, this was in part due to the increase in the staffing, with its consequent increase in outpatient consultation hours and operating time. This increase in numbers suggested that there was indeed a significant "pent-up" demand for paediatric otolaryngology services, as indicated by the very significant increase in workload when the staffing and clinical hours were increased in 2003 and 2004. In fact, it is postulated that the increase in 2003 could have been more, if not for the outbreak of severe acute respiratory syndrome (SARS) in Singapore during the earlier part of 2003.

The above data also provide a review of the current pattern of otolaryngological surgical disease in the Singapore paediatric population, which may require operative intervention. Understanding and monitoring of this trend is important, as it allows the proper allocation of appropriate resources for

the prevention and treatment of common paediatric surgical otolaryngological conditions. Together, the ten most frequently-performed ENT operations (Table II) constituted 78.2% of all procedures. As expected, tonsillectomy, with or without adenoidectomy, was the most frequently-performed ENT operation in children. These are mostly done for children with chronic and/or recurrent tonsillitis, although we did see an increasing trend of paediatric obstructive sleep apnoea cases. As mentioned above, if we combine the top three categories of operations (i.e. "minor" ear and nasal procedures, with tonsillectomy and/or adenoidectomy, which comprise eight of the top ten operative procedures), they constituted a total 70.6% of the total operative workload (Table III).

Tonsillitis is a common childhood condition and fortunately, only a minority of children have chronic symptoms or recurrent episodes which might require surgical intervention. Together with other forms of upper respiratory tract infection (URTI), tonsillitis is more prevalent with an increased exposure to the community and childcare services<sup>(1)</sup>. Education of parents and childcare educators on the need for greater vigilance in this aspect would help to prevent the spread of URTI.

With increasing affluence (and increasing prevalence of obesity) and greater awareness among parents, more children are being seen for problems of snoring and possible obstructive sleep apnoea<sup>(2)</sup>. As hypertrophy of the tonsils and/or adenoids is a frequent significant contributor to the narrowed upper airway, their surgical removal is often being advocated in these children<sup>(3,4)</sup>. However, of equal importance in the management of children who are obese, is the adoption of a more holistic approach, looking into their lifestyle and weight control as well. A multidisciplinary approach is therefore required for the successful long-term management of these obese children<sup>(5)</sup>.

Infections of the middle ear and paranasal sinuses are also a frequent occurrence in children, and the majority of them respond well to conservative management. In recalcitrant cases, surgical intervention may then be required. Fortunately, most of these children can be effectively managed with relative simple surgical procedures (e.g. myringotomy and tympanostomy tube insertion and maxillary antral washout). For cases where there are foreign bodies in the nose or ears, and improper care of the nose and ears leading to minor ailments requiring surgical intervention, "minor" operative procedures would usually suffice.

As borne out in the statistics, the top three categories of procedures contributed to 70.6% of the

**Table III: The top three categories of most frequently-performed operating procedures in the KKWCH Department of Otolaryngology from 2000 to 2004.**

Procedure	Frequency	%
1. Minor ear procedures*	1,373	33.6
2. Tonsillectomy and/or adenoidectomy	1,042	25.5
3. Minor nose procedures #	468	11.5

\* These include myringotomy and tympanostomy tube insertion, EUA of the ears, removal of foreign body and removal of keratosis obturans (60 cases) from ears.

# These include EUA of the nose, removal of foreign body from nose and maxillary antral washout.

total operative workload. As the level of surgical skill sets required to competently manage these cases are not demanding, it would seem that a cost-effective way to deliver such a surgical service would be to train our younger surgeons to be proficient in the required surgical skills. Of particular concern is the significant number of cases of foreign body in the UADT and the ears, which tend to occur in children under five years of age<sup>(6)</sup>. This probably reflects the need for better education of our parents and caregivers in curtailing the number of such occurrences and its consequent morbidity<sup>(7)</sup>.

In conclusion, besides showing a significant increase in the operative caseload in 2003 and 2004, this retrospective review also recognises that the top three categories of "minor" ear and nasal procedures, together with tonsillectomy and/or adenoidectomy contributed more than 70% of the operative caseload. Proper education of parents, caregivers and childcare educators, adopting a more holistic approach in our clinical management, and apportioning relevant resources in the training of healthcare providers, will allow us to deliver more cost-effective healthcare to our paediatric population.

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