Role of Antibiotics in Post-Tonsillectomy Morbidities; A Meta-analytical Study

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Master Degree in Otorhinolaryngology

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List Of Abbreviations

AT	Adenotonsillectomy
FDC	Follicular Dendritic Cells
GABHS	Group A, B-Hemolytic Streptococci
HEV	High Endothelial Venules
ICA	Internal Carotid Artery
IDC	Interdigitating Dendritic Cells
Ig	Immunoglobulin
MALT	Mucosal Associated Lymphoid Tissue
MIT	Microdebrider Tonsillectomy
NSAID	Non-Steroidal Anti-inflammatory Drugs
OSA	Obstructive Sleep Apnea
OSAS	Obstructive Sleep Apnea Syndrome
OHS	Obstructive Hypopnea Syndrome
PFAPA	Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis
PONV	Postoperative Nausea and Vomiting
PSG	Polysomnography
QoL	Quality of Life
SDB	Sleep Disordered Breathing
SRBD	Sleep Related Breathing Disorder
UARS	Upper Airway Resistance Syndrome

Introduction

Adenotonsillectomy is one of the most commonly performed surgeries in the pediatric and young adult populations ***(Piltcher and Scarton, 2005)*.** Despite improvements in anesthetic and surgical techniques, post tonsillectomy morbidities continue to be a significant clinical concern ***(Randall and Hoffer, 1998)*.**

Many studies have addressed various factors that can influence post-tonsillectomy morbidity such as the surgical techniques, methods of hemostasis, the experience of the surgeon and management protocols; but no dramatic improvement was achieved in the recovery after this common surgery ***(Mink et al., 2009)***.

The early post-operative morbidity is very stressful and difficult for both patients and parents. Symptoms of post-tonsillectomy morbidity include fever, bleeding, throat pain, prolonged time to return to normal diet, bad mouth odor (halitosis), otalgia and infection of the tonsillar beds ***(Al-Layla and Mahafza, 2013)***.

Regardless of the surgical technique employed, following tonsillectomy, the tonsillar bed remains exposed

to bacteria from the oral cavity and, since the healing process is by secondary intention, there is an inflammatory response, which contributes to postoperative morbidity. Some authors argue that this contributes to postoperative morbidity, especially in terms of pain ***(Gil-Ascencio et al., 2013)***.

The use of antibiotics in the post-tonsillectomy period is a controversial issue; some believe that postoperative antibiotic prophylaxis is very helpful in this period and advocate it while others do not recommend the use of antibiotics in the post-tonsillectomy period since they found them to be ineffective ***(Al-Layla and Mahafza, 2013)***.

Moreover, the widespread use of antibiotics is associated with the risks of developing gastrointestinal upsets and diarrhea, the spread of antibiotic resistance beside the high cost burden in addition to allergic reactions including anaphylaxis ***(Iyer et al., 2006)***.

However, the only established reason for antibiotic prophylaxis in tonsillectomy is to prevent endocarditis and

sepsis in patients with orthopedic implants, prosthetic valves, history of previous endocarditis, congenital heart disease, or transplant with valvulopathy ***(Ottoline et al., 2013)***.

While individual trials might not be sufficiently large, a meta-analysis would potentially have sufficient power to determine whether postoperative antibiotics reduce post tonsillectomy morbidities ***(Dhiwakar et al., 2008)***.

Aim of the Work

Meta-analytical study of the clinical trials, in order to evaluate the role of antibiotics on post- tonsillectomy morbidities.

Review of Literature

I) Embryology

The tonsils begin developing early in the third month of fetal life. They arise from the endodermal lining of the second pharyngeal pouch, the mesoderm of the second pharyngeal membrane and adjacent regions of the first and second arches. The epithelium of the second pouch proliferates to form solid endodermal buds, growing into the underlying mesoderm; these buds give rise to tonsillar stroma. Central cells of the buds later slough, converting the solid buds into hollow tonsillar crypts, which are infiltrated by lymphoid tissue ***(Larsen et al., 2001)***.

Lymphocytes appear in the reticulum by the third month of gestation and become arranged as lymphatic nodules. Lymphocyte proliferation and maturation then takes place within the surrounding mesenchyme. Definitive lymphoid organization around these crypts can be recognized by the final trimester of development ***(Goeringer and Vidic, 1987)***.

The lingual tonsils develop along the posterior region of the base of tongue. This area is covered by mucous glands, which are subsequently infiltrated with lymphoid

cells during the fifth month of development. Crypts of the lingual tonsils appear at birth and are shallower and less complicated than their palatine counterparts ***(Goeringer and Vidic, 1987)***.

II) Anatomy

Anteriorly and posteriorly, the tonsil is related to the palatoglossus and palatopharyngeus muscles, lying within their respective folds. A few fibers of the palatopharyngeus are found in the tonsil bed and are attached to the lower part of the capsule along with the fibers of the palatoglossus. Superiorly, the tonsil extends into the edge of the soft palate; inferiorly, the tonsillar capsule is firmly attached to the side of the tongue ***(Beasley, 1996)***.

On the lateral surface, the tonsil has a thin distinct capsule, which is formed from condensation of pharyngobasilar fascia. This fascia extends into the tonsil itself, forming septa, which allow passage of nerves and vessels ***(Kenna and Amin, 2009)***.

Deep to the pharyngobasilar fascia, in the upper part of the fossa, is the superior constrictor; below it is the styloglossus passing forward into the tongue. The buccopharyngeal fascia is situated lateral to the superior

constrictor. The glossopharyngeal nerve and stylohyoid ligament pass obliquely downward and forwards beneath the lower edge of the superior constrictor in the lower part of the tonsillar fossa. The paratonsillar vein descends from the soft palate across the lateral aspect of the capsule of the tonsil before piercing the pharyngeal wall to join the pharyngeal plexus ***(Beasley, 1996)***.

The medial free surface projects into the oropharynx and is covered by a thin layer of stratified squamous epithelium, which extends from the surface deep into the tonsil, forming crypts ***(Kenna and Amin, 2009)***.

The medial surface has a pitted appearance; each tonsil has 10-20 pits. The openings of the crypts are fissure like, and the walls of the crypt lumina are collapsed and in contact with each other ***(Gray et al., 2005)***.

Vascular Supply

The blood supply to the palatine tonsils is variable, but in general, they are supplied by several branches of the external carotid artery, which include the ascending pharyngeal, ascending palatine, and branches of the lingual and facial arteries. The blood supply enters from the lower portion of the palatine tonsil pole. The internal carotid

artery (ICA) lies approximately 2 to 2.5 cm deep and posterolateral to the palatine tonsil ***(Jeyakumar et al., 2013)***.

However case reports exist of aberrant ICA courses, which come within 1 cm of the inferior pole. The ICA may have a tortuous and convoluted course of which the surgeon must be cognizant ***(Ceylan et al., 2010)***.

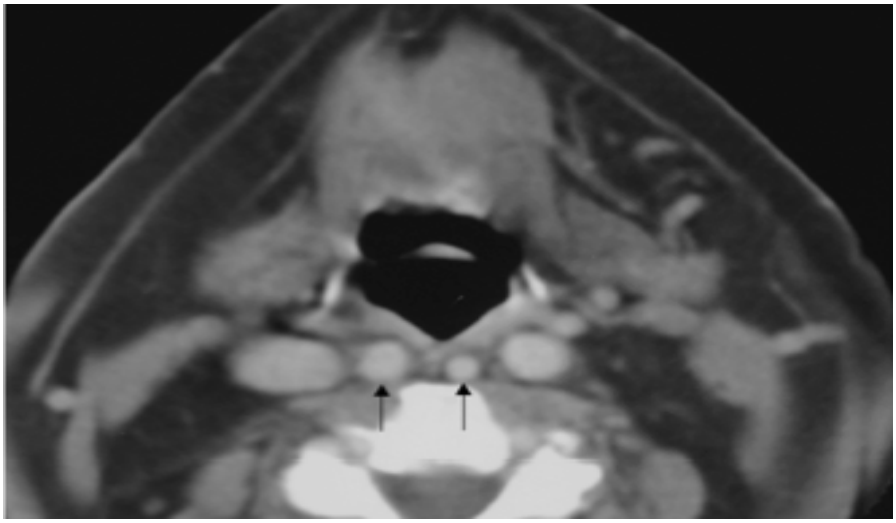

Figure (1): Axial contrast CT scan of the oropharynx showing medialization of both ICA's reaching the retro- pharyngeal midline (arrows), and also medialization of both internal jugular veins. ***(Muñoz et al., 2010)***

Venous drainage is by way of a peritonsillar venous plexus, which surrounds the capsule and drains into the lingual and pharyngeal veins ***(Jeyakumar et al., 2013)***.