Bacteriology in Adenoid Disease

Azzam M.Salami* **FICMS**
Raid Y. Yousef** **FICMS**
Sua'ad A. faza'a** **MSc**
Roaida Y. Yousef** **BSc**

Summary:

Background: Adenoidal hypertrophy is generally considered a common condition of childhood .When obstructive symptoms or recurrent otitis media (suppurative or non suppurative) occurs, adenoidectomy is generally indicated.A wide range of bacteria could be isolated from the surface and core tissue of the removed adenoid tissue.

Patients and Methods: A prospective study carried out in the ENT Department of AL-DIWANIYAH Teaching Hospital between October 2007 and September 2008.Involved 73 patients between 3 and 7 years, they were 31 male and 42 female .All patients underwent adenoidectomy .Surface and core swabs was taken from all specimens and submitted to bacteriological study.

Results: Pathogens were detected in (83.56%) of core specimens versus (46.57%) in surface swab cultures. β -hemolytic streptococcus was the most commonly grown organism in the core of the adenoid and/or surface culture. Resistance was shown to the commonly used antibiotics by most of the isolated pathogens.

Conclusion: β -hemolytic streptococcus is the most common isolated organism in patients with adenoidal hypertrophy followed by Staphylococcus aureus, Streptococcus pneumonia then Haemophilus influenzae. Most of the isolated strains show resistance to the commonly used antibiotics.

J Fac Med Baghdad
Vol. 51, No.3, 2009
Received: Oct., 2008
Accepted: Jan., 2009

Keywords: Adenoid disease, Bacteriology, Adenoid surface swab, Adenoid core swab.

Introduction:

Adenoid tissue is a lymphatic structure found at junction of the roof and posterior wall of the nasopharynx. (1) The normal adenoids attain their maximum size between the age of 3 and 7 years and then regresses gradually and most disappear by the age of 12. It is certainly possible that recurrent infections are the sole cause of abnormally large adenoids, although it has been suggested that allergic episodes also result in adenoidal enlargement. Adenoidectomy is indicated when adenoidal hypertrophy cause one or more of the followings: Nasal obstruction, Otitis media with effusion, recurrent acute otitis media and obstructive sleep apnea. (2)

Materials and Methods:

This study is prospective in nature, consisted of 73 children complaining from chronic adenoiditis or adenoid hypertrophy. They had been admitted to the E.N.T. department of Al-Diwaniyah Teaching Hospital for elective adenoidectomy between October 2007 and September 2008, the age range from 3 to 7 years, they were 31 male and 42 female. The collected specimens include;adenoid surface swab after positioning the patient under general anesthesia and oropharyngeal suction, catheter inserted through the nasal cavity and pulled through oral cavity to retract the soft palate and shows adenoid, the adenoid surface was swabbed and the swabs were collected in sterile tube and adenoid core swab; the adenoid were removed by curette, washed in a sterile saline and placed in a sterile dish, and the deep surface of the adenoid was cut using a sterile scalpel and the core was sampled using a sterile tube. Both swabs (core and surface) were cultured on the following media: maCconkey agar medium (oxoid, England) for isolation of Enterobacteriaceae,blood agar medium (oxoid, England) to show the hemolytic properties of micro organism,chocolate agar (oxoid, England) for isolation of bacteria that require special growth factors,thayer-Martin agar (oxoid, England) for isolation of neisseria and mannitol-salt agar (oxoid, England) for isolation and identification of staphylococci.

Also, antibiotic sensitivity tests were carried out for pathogenic isolates by disc diffusion technique according to the recommendations of National Committee of Clinical Laboratory Standards (1990). Antibiotic discs used; Amoxicillin, Amoxicillin clavulanic acid, Erythromycin, Ampicillin, Amikacin, Rifampcin, Cephalothin, Trimethoprim-sulfa methoxazole, Cefotaxime.

Reading of the plates was done according to WHO (2002) by measuring the size of inhibition zone in millimeter.

**College of Medicine, Baghdad University*
*** Al- Diwaniyha Teaching Hospital*

Results:
By comparing the culture results of adenoid surface and core swabs regarding the type of isolated organism, core culture revealed pathogenic organism in 83.56% (61 cases) while surface swab detected pathogenic organism in 46.57% (34 cases) of the studied cases. Adenoid surface swab revealed growth of normal flora in 53.4% (39 cases) while adenoid core revealed that in only 16.4% (12 cases) of the studied cases.

Table 1

Adenoid surface	Adenoid core	No. of patients	
		No.	%
Same path.	Same path.	14	19.18
Same path.	Same path. + diff. path.	4	5.48
Diff. path.	Diff. path.	9	12.32
Diff. path. + same path.	Same path.	-	-
Pathogen	No pathogen	7	9.59
No pathogen	Pathogen	34	46.57
	Total	68	

Table 1 compares between adenoid surface and adenoid core cultures regarding th similarity and difference of the detected pathogens. It reveals that; out of 68 patients yielding pathogens, 14 cases (19.18%) had the same pathogens in both adenoid surface and core culture, 4 cases (5.48%) had same pathogens in addition to different pathogen in the adenoid core culture, 9 cases (12.32%) had different pathogens in both cultures, 7 cases (9.59%) had pathogens in surface swab culture with no pathogen in the corresponding adenoid core culture. No cases revealed additional pathogens in adenoid surface swab culture, 34 cases (46.57%) revealed pathogenic growth in adenoid core with no pathogens in surface swab.

Table 2

Organism	Surface swab	Core swab	Surface & core swab	Cases yielding that organism	
				N	%
β-haemolytic streptococci	10	32	27	69	94.5
Staph. Aureus	12	30	24	66	90.41
Streptococcus pneumoniae	14	29	21	64	87.6
Haemophilus influenzae	12	15	13	40	54.8
Moraxella catarrhalis	10	12	10	32	43.83
Staph. Epidermidis	7	15	3	25	34.24
Klebsiella pneumoniae	5	-	-	5	6.84
Coagulase negative staphylococci	5	-	-	5	6.84
Diphtheroid spp.	4	-	-	4	5.47
Escherichia coli	2	-	-	2	2.73

Table 2 reveals the organisms isolated from the adenoid surface and core swabs, shows that β-haemolytic streptococci was the most commonly growing organism in the surface and/or core culture (69 patients out of 73) (94.5%), followed by staph aureus (90.41%), streptococcus pneumoniae (87.6%), haemophilus influenzae (54.8%), moraxella catarrhalis (43.83%), staph. Epidermids (34.24%). Other bacteria were isolated from adenoid surface only. These include klebsiella pneumoniae (6.84%), coagulase negative staphylococci (6.84%), diphtheroid spacies (5.47%) and E. coli (2.73%).

Table 3

Antibiotics	Strep. Pneumoniae			β-haemolytic strep.			H. influenzae			Staph. Aureus		
	S	I	R	S	I	R	S	I	R	S	I	R
Amoxycillin (AM)	5	9	50	5	7	57	3	-	37	10	-	56
Amoxicillin-clavulanic acid (AX)	9	-	55	14	3	52	1	1	38	7	2	57
Erythromycin (E)	2	4	58	1	3	65	3	-	37	2	-	64
Ampicillin (Am)	-	2	62	-	6	60	2	-	38	1	2	63
Amikacin (AK)	54	5	5	20	7	42	25	3	12	50	6	10
Rifampin (RA)	44	2	18	14	5	50	4	7	29	45	9	12
Cephalothin (KF)	18	3	43	25	2	42	7	5	28	14	-	52
Trimethoprim-sulfamethoxazole (SXT)	21	8	35	22	-	47	10	9	21	2	7	57
Cefotaxime (CTX)	9	5	50	15	-	54	12	-	28	3	2	61

Table 3 shows antibiotic sensitivity results of isolated strains, regarding β-haemolytic streptococci show resistant to all used antibiotics, Staph. aureus 50 out of 66 isolates were amikacin sensitive,45 were rifampcin sensitive ansistance to other used antibiotics. Streptococcus pneumoniae 54 out of 64 isolates were amikacin sensitive, 44 were rifampcin sensitive and show strong resistant to other used antibiotics, H. influenzae 25 out of 40 were amikacin sensitive and show resistant to other used antibiotics.

Discussion:

This study was done to know the most common micro organism in adenoid tissue of children with chronic adenoiditis or adenoid hypertrophy. Pathogens were detected in 83.56% in adenoid core swabs versus 46.57% adenoid urface. β-haemolytic streptococcus was the most isolated organism from the adenoid surface and/or core followed by staph. Aureus. Also most isolated bacteria show resistant to all used antibiotics. Our results agree with Rodriguez etal (1995)[3], McLinns etal (1996)(4), Leed etal (1997)[5],Brook etal (2001)(6). But in contrast with Fearon etal (1992)(7) and Suzuk etal (1999)(8) who show H. influenzae is the most common micro organism in adenoid culture of patients with chronic adenoiditis or adenoid hypertrophy.

Conclusion:

β-haemolytic streptococcus was the most common isolated organism in patients with chronic adenoiditis or adenoid hypertrophy, followed by Staph. aureus, Streptococcus pneumoniae then H. influenzae, there is discrepancy between adenoid surface and core cultures. Most of isolated strains show resistance to the commonly used antibiotics.

References:

1.Logan Turner's disease of the nose, throat, and ear, 10th edition 1988.

2.Scott-Brown's pediatric otolaryngology, 6th edition 1997.

3.Rodriguez WJ, Schwartz RH, Thorne MM. Increasing incidence of penicillin – and ampicillin-resistant middle ear pathogens. Paediatr infect Dis J, 1995, 141075-1078.

4.Mclinn S, William D. Incidence of antibiotic-resistant streptococcus pneumoniae and beta-lactamase-positive haemophilus influenzae in clinical isolates from patients with otitis media. Paediatr infect dis J, 1996, 75 (suppl)s3-s9.

5.Lee D, Rosenfeld RM. Adenoid bacteriology and sinonasal symptoms in children. Otolaryngol headneck surg.1997, 116; 301-307.

6.Brook I and Shan K (2001) bacteriology of adenoids and tonsils in children with recurrent adenotonsillitis. Anuals of otology, rhinology and laryngology 110,844-8.

7. Fearon M, Bannatyne RM, Faron BW, Turner A, and Cheung R (1992). Differential bacteriology in adenoid disease. Journal of otolaryngology 21,434-6.

8. Suzuki M, Watanabe T, and Mogi G (1999) clinical, bacteriological and histological study of adenoids in children. American journal of otolaryngology 20, 85-90.