Comparison of The Bacteriology of Tonsil Surface and Core in Bacterial Profile Isolated from Children with Chronic Tonsillitis

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Abstract

This study included 73 children of aged range from 3 to 10 years with chronic tonsillitis. They underwent elective tonsillectomy in the E.N.T. department of Al-Diwaniyah Teaching Hospital. The following specimens were taken from each patient, throat swab after positioning the patient under general anesthesia, core swab specimen after removal of tonsils for bacteriological examination. Pathogens were detected in (90.4%) of core specimens versus (41%) in surface swab cultures. *Staphylococcus aureus* was the most commonly grown bacteria in the core of the tonsils and/or surface culture. Regarding antibiotics sensitivity, commonly used antibiotics yielded unsatisfactory results for isolated pathogens.

In conclusion, there is discrepancy between tonsillar surface and tonsillar core culture results in cases of chronic tonsillitis. Also the role of throat swab in management of chronic tonsillitis doubtful.

الخلاصة

يعتبر الالتهاب المزمن باللوزتين اكثر امراض الحلق شيوعا في الاطفال. وتهدف هذه الدراسة الى المقارنة بين مسحة الحلق والمزرعة البكتريولوجية للب اللوزتين في تشخيص الميكروبات المسببة للالتهاب المزمن باللوزتين. وقد تضمنت الدراسة 73 طفلا تتراوح اعمارهم بين (3-10 سنوات) ممن يعانون من التهاب مزمن باللوزتين، وقد تم استئصال اللوزتين لهم في شعبة الإذن والأنف والحنجرة في مستشفى الديوانية التعليمي وتم اخذ مسحة للحلق وعينة من لب اللوزتين بعد استئصال اللوزتين مباشرة واجراء مزرعة بكتريولوجية لكل عينة وقد تم فصل البكتريا الممرضة من (90.4%) من عينات لب اللوزتين و(41%) من مسحات الحلق. وقد اشارت نتائج المزرعة الى ان الـ Staph aureus هو اكثر الميكروبات التي تم عزلها في حالات الدراسة. وبالنسبة لحساسية الميكروبات التي تم عزلها من حالات الدراسة للمضادات الحيوية فقد وجد ان معظم الميكروبات ذات مقاومة للمضادات الحيوية الشائع استخدامها في العراق. وقد استخلصت الدراسة انه هناك تناقض في النتائج المستخلصة من المزرعة البكتريولوجية لمسحة الحلق ولب اللوزتين في حالات التهاب اللوزتين المزمن وانه لا يمكن الاعتماد على مسحة الحلق لتشخيص الميكروبات المسببة لالتهاب اللوزتين المزمن.

Introduction

Chronic tonsillitis is the common disease in throat that occurs predominantly in the younger age group.[1]

Tonsillectomy is indicated in 1) recurrent acute tonsillitis for at least two years with five or more acute attacks per year, 2) peritonsillar abscess (quinsy, 3) sleep apnea syndrome.[2]

Aim of study

To compare between throat swab and tonsil core bacterial culture result in chronic tonsillitis.

Materials and Methods

This study is prospective in nature, consisted of 73 children complaining from chronic tonsillitis. They had been admitted to the E.N.T. department of Al-Diwaniyah Teaching Hospital for elective tonsillectomy between October 2007 and September 2008. The age ranges from 3 to 10 years. They were 31 males and 42 females. The conditions of cultivation aerobic. The collected specimens included:

a) Tonsillar surface swab after positioning the patient under general anesthesia and pharyngeal suction, the tonsil surface was swabbed and the swabs were collected in a sterile tube.
b) Tonsillar core swab: the tonsils were removed by dissection, washed in sterile saline and placed in a sterile dish, and the deep surface of the tonsils was cut using a sterile scalpel and the core was sampled using a sterile swab.
Both tonsillar swabs (surface and core) were culture on the following media:
1. MaCconkey agar medium (Oxoid, England) for isolation of *Enterobacteriaceae*.
2. Blood agar medium (Oxoid, England) to show the haemolytic properties of micro organism.
3. Chocolate agar (Oxoid, England) for isolation of bacteria that require special growth factors.
4. Thayer-Martin agar (Oxoid, England) for isolation of neisseria.
5. Mannitol-Salt agar (Oxoid, England) for isolation and identification of staphylococci.

Also antibiotic sensitivity tests were carried out for pathogens isolates by disc diffusion technique according to the recommendations of National Committee of Clinical Laboratory Standard (1990).

Antibiotic discs used: Amoxycillin, Amoxycillin clavulanic acid, Erythromycin, Ampicillin, Amikacin, Rifampin, Cephalothin, Trimethoprim-sulfamethoxazole, Cefotaxime.

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

Results

On comparing the culture results of throat swab and tonsil core as mentioned in table (1) regarding the type of isolated bacteria, core culture revealed pathogenic bacteria in (90.4%) (66 cases) while throat swab detected pathogenic organism in (41%) (30 cases) of the studied cases.

Throat swab revealed growth of normal flora in 58.9% (43cases) while tonsil core revealed that in only 9.59% (7 cases) of the studied cases.

Table 1

The table reveals the bacteria isolated from the tonsil surface swab and core specimens. Regarding pathogens *staphylococcus* aureus, was the most commonly grown organism in the core of the tonsil and/or surface culture (65 patients out of 73) (89.05%), 10 in throat swab only, 28 in tonsil core only and 27 in both throat swab and tonsil core. Group A β-haemolytic streptococci (GABHS) was isolated from 39 patients (53.43%), 7 yielded the organism in throat swab and 23 in the tonsil core. *Haemophilus influenza* was isolated from 34 patient (46.58%), 20 were detected in throat swab, 9 in core swab, 5 in the throat swab and tonsil core. E. coli was

detected only in tonsil core of one patient (1.37%). Enterobacter was detected only in tonsil core of one patient (1.37%). Klebsiella pneumoniae was detected(2 cases) in both throat swab and tonsil core (2.74%). Regarding commensals neisseria catarrhalis was isolated from 59 cases (80.83%) 35 cases yielded neisseria in throat swab, 17 in both throat swab and tonsillar core and 7 in tonsillar core only. Micrococcus, diphtheroid, coagulase negative staphylococci, streptococcus pneumonia were isolated from 3 (4.11%), 4 (5.48%), 9 (12.33%) and 7 (9.59%) of patients respectively.

Table 1 Bacteria isolated from throat swab and tonsil core

Bacterial type	Throat swab	Core swab	Throat & core swab	Cases yielding that organism	
				No:	%
*pathogens					
Staph-aureus	10	28	27	65	89.05
β -haemolytic streptococci (A)	7	23	9	39	53.43
Haemophilus influenza	20	9	5	34	46.58
Escherichia coli	1	-	-	1	1.37
Enterobacter	1	-	-	1	1.37
Klebsiella pneumoniae	-	-	2	2	2.74
* Commensals					
Moraxelle Catrrhalis	35	7	17	59	80.83
Micrococcus	3	-	-	3	4.11
Diphtheroid	1	3	-	4	5.48
Coagulase negative staphylococci	-	9	-	9	12.33
Streptococcus pneumoniae	-	7	-	7	9.59

Table 2

The table compares between throat swab and tonsil core as regards similarity in detected pathogens. It reveals that out of 69 patients yielding pathogens, 15 cases (21.74%) had the same pathogens in both throat swab and tonsil core cultures, 5 cases (7.25%) had the same pathogens in addition to different pathogens in the tonsil core culture, 7 cases (10.15%) had different pathogens in both cultures, 3 cases (4.35%) had pathogen in throat swab culture with no pathogens in the corresponding tonsil core culture. No cases revealed additional pathogens in throat swab culture, 39 cases (56.53%) revealed pathogenic growth in the tonsil core with no pathogens in throat swab.

Table 2 Comparison between throat swab and tonsil core as regards similarity in detected pathogens

Throat swab	Tonsil core	No. of patients	
		No:	%
Same path.	Same path.	15	21.74
Same path.	Same path. + diff. path.	5	7.25
Diff. path.	Diff. path.	7	10.15
Diff. path + same path.	Same path.	-	-
Pathogen	No pathogen	3	4.35
No pathogen	Pathogen	39	56.53
Total		69	

Table 3

The table shows the antibiotic sensitiviity results of bacterial isolates. Regarding staph. aureus, 50 out of 65 isolates were Amikacin sensitive, 45 were Rifampcin sensitive, 20 were Trimethoprim-sulfamethoxazole sensitive. Most isolated *staphylococcus* aureus strains were resistant to Ampicillin (58 out of 65) and Amoxicillin-calvulanic acid (54), cephalothin (52), cefotaxime (51), Amoxycillin (50). Regarding group A, β-haemolytic streptococci were sensitive to Amikacin (21 out of 39), resistant to Ampicillin (39), Erythromycin (38), Amoxycillin clavulanic acid (37), Amoxycillin (36). Haemolytic influenza resistant to all used antibiotics. Gram negative (Gve) bacilli sensitive to Amikacin (3 out of 4) and sensitive to Trimethoprim sulfamethoxazole (3 out of 4) and resistant to other used antibiotics.

Table 3 Antibiotic sensitivity profile of pathogenic bacterial isolates

Antibiotics	Staph.aureus No:=65			B-haemolytic streptococci No:=39			Haemophilus influenza No:=34			Gram negative bacilli No:=4		
	S	I	R	S	I	R	S	I	R	S	I	R
Amoxycillin (AM)	5	10	50	3	-	36	1	-	33	-	-	4
Amoxycillin clavulanic acid (AX)	10	1	54	1	1	37	3	2	29	-	-	4
Erythromycin (E)	2	56	7	-	1	38	1	1	32	-	2	2
Ampicillin (AM)	2	5	58	-	-	39	-	-	34	-	-	4
Amikacin (AK)	50	10	5	21	-	18	14	-	20	3	-	1
Rifampin (RA)	45	2	18	15	4	20	3	3	28	2	-	2
Cephalothin (KF)	7	6	52	6	12	21	6	-	28	1	-	3
Trimethoprim-sulfamethoxazole (SXT)	20	10	35	5	3	31	7	-	27	3	-	1
Cefotaxime (CTX)	10	4	51	5	8	26	3	2	29	2	-	2

S=sensitive I=intermediate R=resistant

Discussion

This study was done to compare between throat swab and tonsil core culture in chronic tonsillitis. Pathogens were detected in 41% in throat swab versus 90.4% in tonsil core, while normal flora were detected in 58.9% in throat swab versus 9.59% in tonsil core.

These results agree with *Kurien, et.al.*(2000)[3], who revealed pathogens in 55% of throat swab and in 72.5% of core cultures, also our results agree with Abbas, et.al.(1997)[4], and Timon, et.al.(1991)[5] Surow, et.al.(1989)[6].

Yet, our results are in contrast with Almadori, et.al.(1988)[7], who noted that there is no discrepancy between surface and core cultures.

Conclusion

There is a discrepancy between tonsil surface and tonsil core culture result in chronic tonsillitis. Also the role of throat swab in management of chronic tonsillitis is doubtful.

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