
PATHOGENICITY OF *STREPTOCOCCUS PYOGENSE* ASSOCIATED AMONG TONSILLITIS PATIENTS AND TONSILLECTOMY

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ABSTRACT: *Two hundred patients with tonsillectomy (TS) in Basrah, 102(51%) males and 98(49%) Females, with male: females ratio (1.04:1) and 50 individual without tonsillitis problems as control group were included in this study, which was done during the period of April,2015 to Jun, 2017. This Include collection of throat swab samples, culturing of samples, identification of causative agents species and antibiotic sensitivity. Gram's positive bacteria were the commonest microorganisms .the comments' causative agents was Streptococcus pyogenes 30 isolates (15%) followed by Staph.aureus was 28 isolates (14%) isolated from (200) chronic tonsillitis patients before and after tonsillectomy,while the most normal flora was Streptococcus.(α -hemolytic) 45 isolates (90%),,followed by Staphylococcus epidermidis 40(80%) from (50) health persons . Most isolated of Streptococcus pyogenes were high sensitive to antibiotic such as Clindamycin, Rifampin, and Azithromycin . while moderate sensitive to Penicillin-G Cefotaxime, Ceftriaxone, trimethoprim , and resistant to Augmentine, ampicillin, Cloxacillin, in this study most commo Streptococcus pyogenes isolated associated with pyrogenic toxin SPeB (76%),flowed by SPeC (60%)and SPeA (26%) .*

KEYWORDS: Pathogenicity , Streptococcus pyogenes, ass tonsillitis patients, Tonsillectomy

INTRODUCTION

Tonsils: are amass of lymphoid tissue which divided into three type including naso pharyngeal tonsils (Adenoid) , lingual tonsil and platen tonsil . Palatine tonsil was the largest accumulation of lymphoid tissue in the head and neck region. Each tonsil has a compact body with a definite thin capsule on its deep surface of a stratified squamous epithelium tissue lines on the outer surface of the tonsil and invaginates deeply into the lymphoid tissue to form multiple crypts. (1). Tonsillitis is inflammation of the of tonsils charecterized by redness ,swelling of the tonsils lead to effect in physiological and immunological status of the patiants . The most common type of tonsillitis (Acute tonsillitis and chronic tonsillitis)

Acute tonsillitis also known as severe tonsillitis (true tonsillitis) , or acute sore throat which the common disease and contagious infection between overcrowding places such as primary schools and secondary schools ,which occur due to viral or bacterial infection lead to odynophagia, swelling and redness of the tonsils, tonsillar exudate, cervical lymphadenopathy and fever $>38.3^{\circ}\text{C}$ (2). Odynophagia for 24-48 hours, as part of prodromal symptoms of a common cold (viral infection of upper respiratory tract), which excluded from the acute tonsillitis the appearance of the tonsillar exudates

on the surface of tonsil's can distinguish the early stage of bacterial type from viral (3). Chronic tonsillitis most frequent lesions within pharynx inflammatory pathology with multiple complications such as otitis media , suppurative otitis , chronic mucopuritus rhinitis, sinusitis, ocular and lachrymal pathways infections, and complications descending respiratory infections and at the distance ,glomerulonephritis, joint rheumatism, endocarditis, enteritis, appendicitis, persistent albuminuria, etc.)

MATERIALS AND METHODS:

Patients: A total number of (200) patients with Acute and chronic tonsillitis attended to the Basra General Hospital (out patients clinic of E.N.T), where examined under supervision of specialists of ENT. 200 tonsils swabs were taken from all patients. Microbiological investigation performed includes (culture, identification of causative agents and antibiotic sensitivity. The study was carried in Basrah General Hospital, out patients E.N.T. clinic and E.N.T. operation theater , during the period from April , 2015 to Jun, 2017, Patients were distributed according to age(1-60)years and sex, there were 102(51)% males and 98(49)% females,

Control group:

A total of 50 individuals without tonsils problems, 30(60%) males and 20 (40%) females in various age group, they were regarded as a control group.

Sampling:

Two groups were included in this study:

Group (1) 200 throat swabs were taken from Acute and chronic tonsillitis patients.

Group (2) 50 throat swab taken from a control group. Swabs were taken under sterile condition and transfer immediately to the laboratory by brain heart broth or transport medium swabs where cultured on Blood agar at 37°C for 24 to 48 h.

Antibiotic discs:

penicillin G 10mg (Bioanalyse).
Azithromycin 15 mg (Bioanalyse).
Cefotaxime 30mg (Bioanalyse).
Ceftriaxone 30 mg (Bioanalyse).
Cloxacillin 10mg (Bioanalyse).
Ampicillin 10mg (Bioanalyse).
Augmentin 20 mg (Bioanalyse).
Trimethoprim 25mg (Bioanalyse).
Rifampin 10mg (Bioanalyse).
Lincomycin 2mg (Bioanalyse)
Clindamycin 40mg (Bioanalyse)

RESULTS

Table 1. show most common isolated bacterial from(50) healthy persons. Include the following isolated , *Streptococcus*.(α -hemolytic) 45 isolates (90%),followed by *Staphylococcus epidermidis* 40(80%) , *Morexella catarrhalis* 38(76%) , *Diphtheroid spp* 30(60%), *Corynebacterium spp* 15(30%), *Bacillus spp.* 10(20%) , *Candida spp* 20(40%) and 15(30%) No growth.

Table 1. Bacterial types isolated from healthy person (control group).

Microorganisms	No.of isolates %
<i>Streptococcus</i> .(α -hemolytic)	45(90%)
<i>Staph.epidemedis</i>	40(80%)
<i>Morexella catarrhalis</i> .	38(76%)
<i>Diphtheroid spp</i>	30(60%)
<i>Corynebacterium spp</i>	15(30%)
<i>Bacillus spp.</i>	10(20%)
<i>Candida spp</i>	20(40%)
No growth	15(30%)

Table 2. The occurrence include various bacterial isolate from patients with tonsillectomy the most common pathogens *Streptococcus pyogense* 30 isolates (15%) followed by *Staph.aureus* was isolated in 28 isolates (14%) ,then *E.coli spp* 26(13%), *Klebsiella spp* 25(12.5%). *Pseudomonas aeruginosa* 20(10%) *Proteus spp.*15(7.5%), *Bacillus spp* 10(5%), *Corynebacterium spp.* . 10(5%), *Corynebacterium spp.* 10 (5%), and *Candida Spp spp.* 20(10%).

Table 2.Bacterial type isolated from patients with tonsillectomy

Caustive agents	No .of isolates	(%)
<i>Streptococcus pyogense</i>	30	(15%)
<i>Staph.aureus.</i>	28	(14%)
<i>E.coli spp.</i>	26	(13%)
<i>Klebsiella spp.</i>	25	(12.5%)
<i>Pseudomonas aeruginosa</i>	20	(10%)
<i>Proteus spp.</i>	15	(7.5%)
<i>Bacillus spp.</i>	10	(5%)
<i>Corynebacterium spp.</i>	10	(5%)
<i>Candida Spp</i>	20	(10%)

Table 4. Antibiotic sensitivity pattern showed that *Streptococcus pyogenes* isolates high Sensitive to antibiotic Clindamycin 29(97%), followed by Azithromycin 28(93%). Rifampin 27(90%) , while Moderate Sensitive to Penicillin-G 20(66%), Lincomycin 20(66%), Cefotaxime 18(60%), Ceftriaxone 17(56%), Trimethoprim 16(53%) and Resistant to Augmentine 10(33%), Cloxacillin 5(16%) , Ampicillin 4(13%).

Table 4. Relationship between *Streptococcus pyogenes* isolates and antibiotic types

Drugs type	No. of isolates	Sensitive (%)	Resistant (%)
Clindamycin	30	29(97%)	1(3%)
Azithromycin	30	28(93%)	2(7%)
Rifampin	30	27(90%)	3(10%)
Penicillin-G	30	20(66%)	10(34%)
Lincomycin	30	20(66%)	10(34%)
Cefotaxime	30	18(60%)	12(40%)
Ceftriaxone	30	17(56%)	13(44%)
Augmentine	30	10(33%)	20(67%)
Cloxacillin	30	5(16%)	25(84%)
Ampicillin	30	4(13%)	26(87%)
Trimethoprim/ Sulfamethoxazole	30	16(53%)	14(47%)

DISCUSSION

Chronic tonsillitis develops from recurrent acute type of tonsillitis about seven episodes of tonsillitis in the year, five episodes in two successive years or three episodes in each of the preceding three years associated with recurrent bacterial infection lead to suitable treatment tonsillectomy , these opinion agreed with (5). where in our study most the patients enter to surgical tonsillectomy suffering from more than seven episodes of tonsillitis in year due to decrease immunity by pyrogenic toxins of *Streptococcus pyogenes* lead to recurrent tonsillitis our opinion appropriate with study of (6) show that healthy Palatine tonsil, increased immunologic reactivity tissue, thus building a barrier against the pathogenic agents' penetration into the respiratory and digestive tracts .

in the present study Gram's positive pathogenic bacteria were the most common causative include *Streptococcus pyogenes* 30 isolates (15%) followed by *Staph.aureus* 28 isolates (18%) these

result agreed with result of (3) show that Group A beta-hemolytic streptococcus (GABHS), the most common bacterial etiology, accounts for (15%)to (30%) of cases of acute pharyngitis in children and (5 – 20%) percent in adults, and (7). Show that Streptococci still play the largest role of causative agents in acute and chronic tonsillitis reach to (30%) of cases .

In the present study we found various types of Gram's negative pathogenic bacteria such as *E.coli* 26 isolates(13%),*Klebsiella SPP* 25 (12.5), *Pseudomonas aeruginosa* (10%), and *Proteus spp.*(7.5). agreed with study of (8) show that Gram's positive pathogenic bacteria were the most common causative agents associated with acute and chronic tonsillitis in children include Group A beta-hemolytic streptococcus and *Staph.aureus* followed by Gram's negative bacteria such as *E.coli*, *Pseudomonas spp.*

In this study most common normal flora *Streptococcus α*-hemolytic include 45isolate(90%) from 50 person without tonsils problem used as control followed by *Staph.epidemedis* 40(80%). These percentage might be exchange after tonsillectomy due to decrease secretions of palatine tonsils in oropharynx cavity . our result agreed with study of (9) show that Non-haemolytic streptococci most common normal flora in tonsillectomy and (10). Show that tonsils associated with humoral immunity which synthesis and increase secretion quantity of immunoglobulins, and neutralize a part of the oropharynx cavity flora .

In the present study the organisms that cause acute and chronic tonsillitis are become more resistant to antibiotic. For example, according to recent studies, between (30 to 50)% of *S. pyogenes* bacteria are now partially resistant to the antibiotic Augmentine 10(33%), Cloxacillin 5(16%) , Ampicillin4(13%) due to the Antibiotic lose their effectiveness in children because continuous treated with them in a short period of time or the drug's have low efficacy . (11) show that the failure rate of treating pharyngitis and tonsillitis infections with β-lactam antibiotics is high than 35% of reasons that are not known but may include the presence of intracellular.

In this study about 200(100%) of acute patients converted to chronic type and undergoes tonsillectomy which choice treatment for these patients due to antibiotic failure this result appropriate with (2) study show that Without treatment, streptococcal pharyngitis is associated with persistence of positive throat cultures for up to 6 weeks in 50% of patients In contrast, treatment with an active antibiotic results in negative throat cultures within 24 hours in more than 80% of patients. and our study disagree with (12) show that GABHS pharyngitis is self-limited and resolves within a few days, even without treatment.

Our result agree with (13) show that False-negative results and misdiagnosis of treatment to GABHS lead to spread and, converted the acute types to chronic types of disease and increased suppurative and nonsuppurative complications. Penicillin, however, remains the agent of choice because of its proven efficacy, safety, narrow spectrum, and its low cost. Risk factors for tonsils infection include crowding, poor living conditions, , poor hygiene, and poverty . While crowding in places such as schools is the major risk factor for pharyngeal and tonsillitis infection with GAS strains. (2,14).

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