

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital**Duraid Hameed Abid Alkadem****Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital**

Duraid Hameed Abid Alkadem

Department of Otolaryngology - College of medicine, Head and Neck Surgery - Diyala University

duraid_hameed@yahoo.com**Received: Accepted:****Abstract**

Pharyngitis is the third most common chief complaint in outpatient healthcare clinics. In most cases of pharyngitis, the most common causes are infectious in origin. This infection can result in a very large tonsils, which cause troubles in swallowing and breathing. The purpose of this study is to determine the efficacy of throat swab together with the most common bacterial species that can be isolated from smear samples obtained from pharyngeal swabs in patients with chronic or recurrent pharyngitis. This may help in better understanding and accurate treatment of this disease. This prospective study was conducted on adult outpatients with recurrent pharyngitis. In total, 100 throat swab samples were taken from selected patients with chronic pharyngitis referred to the outpatient (ear, nose and throat) Department in Baquba Teaching Hospital. The number of female cases were (42) with an age range of 19 to 55 years, while the number of male cases were (58) and aged with an age of 16 to 70 years. After that, these samples were sent for culture and sensitivity. Individuals with recurrent pharyngitis have normal flora in 53% of cultured swabs. *Streptococcus pyogenes* has been isolated from 25% of cases, *Staphylococcus aureus* from 5%, *Pseudomonas aeruginosa* from 1%, *Corynebacterium diphtheria* from 1% and *E.coli* 5% while no growth has been obtained in 10% of samples. This study suggests that adult patients who have pharyngitis involving the palatine tonsils more than three times per year can benefit from throat swab for culture and

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

sensitivity for rapid detection of pathogenic bacteria and for the selection of the appropriate antibiotic treatment.

Keywords: (GAS) group A streptococci, chronic pharyngitis, chronic tonsillitis.

عزل البكتيريا من المرضى البالغين الذين يعانون من التهابات البلعوم المتكررة او المزمنة في مستشفى بعقوبة التعليمي

دريد حميد عبد الكاظم

قسم الجراحة - كلية الطب - جامعة ديالى

الخلاصة

التهاب البلعوم هو ثالث شكاوى مرضية رئيسية والأكثر شيوعاً في العيادات الطبية الصحية. حيث ان معظم اسباب حالات التهاب البلعوم والأكثر انتشاراً هي المعدية. ان هذه العدوى يمكن أن تؤدي إلى التهاب وتضخم في اللوزتين مما يسبب صعوبة في البلع والتنفس. ان الغرض من هذه الدراسة هو تحديد فعالية مسحة البلعوم وكذلك تحديد الأنواع البكتيرية الأكثر شيوعاً التي يمكن عزلها من عينات تم الحصول عليها من مسحات البلعوم من المرضى الذين يعانون من التهاب البلعوم المزمن أو المتكرر، والتي يمكن أن تساعدنا في فهم أفضل وعلاج ادق لهذا المرض. أجريت هذه الدراسة على المرضى البالغين اللذين يعانون من التهاب البلعوم المتكررة او المزمنة. حيث تم أخذ 100 مسحة من بلعوم المرضى الذين يعانون من هذا المرض في قسم العيادات الخارجية (الأنف، الأذن والحنجرة) في مستشفى بعقوبة التعليمي. لقد بلغ عدد الحالات في هذه الدراسة من الإناث (42) حالة في الفئة العمرية من 19 إلى 55 سنة، في حين بلغ عدد الحالات من الذكور (58) حالة تتراوح أعمارهم بين 16 إلى 70 عاماً. بعد ذلك تم إرسال هذه العينات الى المختبرات المختصة في مستشفى بعقوبة التعليمي لغرض اجراء فحص الزرع البكتيري. في هذه الدراسة تبين ان الأفراد الذين يعانون من التهاب البلعوم المتكررة لديهم normal flora في 53% من العينات. وقد تم عزل *Streptococcus pyogenes* في 25% من الحالات و *Staphylococcus aureus* 5%، *Pseudomonas aeruginosa* 1% و *Corynebacterium diphtheria* 1%، و *E.coli* 5%. وكذلك لم يتم الحصول على أي نمو بكتيري في 10% من العينات. وتشير هذه الدراسة إلى أن المرضى البالغين الذين لديهم التهاب البلعوم المزمن او المتكرر أكثر من ثلاث مرات في السنة يمكنهم الاستفادة من مسحة البلعوم للكشف السريع عن البكتيريا المسببة للأمراض واختيار العلاج المناسب بالمضادات الحيوية الفعالة.

الكلمات المفتاحية: (GAS) group A streptococci، التهاب البلعوم المزمن، التهاب اللوزتين المزمن.

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

Introduction

Pharyngitis which is the inflammation of pharynx and tonsils, is a common condition observed in outpatients looking for healthcare provision. Studies and researches on the prevalence of recurrent pharyngitis is limited especially in Iraq [1]. Despite antibiotic treatment, acute pharyngitis may persist and it has been estimated that 1-2% of acute pharyngitis progresses to recurrent or chronic disease. Although an exact definition of chronic or recurrent pharyngitis has some arguments, most ear, nose and throat (E.N.T) specialists consider three or more recurrent infections per year to establish a chronic condition. Unlike acute pharyngitis, which is almost commonly infectious in etiology, chronic pharyngitis can be attributed to some important non-infectious causes [2,3].

Recurrent pharyngitis may be caused by inappropriate antibiotic treatment, inadequate dose or duration of antibiotic therapy, reinfection, antibiotic resistance to penicillin produced by local breakdown of penicillin by beta-lactamase creating commensals, little absorption of antibiotics, infected toothbrushes or orthodontic uses and other unknown reasons [4]. Many non-specific factors that irritate the pharyngeal mucous membrane and predispose to recurrent pharyngitis such as tobacco smoking, chronic sinusitis, allergic conditions, poor dental hygiene, gastro-esophageal reflux, and exposure to dust [4,5].

In most cases of pharyngitis, the most common causes are infectious in origin. Viruses are the contributing factors in most cases, but bacteria are blamed for 30-40% of pharyngitis. Group A B - hemolytic *Streptococcus pyogenes* (GAS) is of particular diagnostic importance because of the risk of serious complications [6]. Generally, only some findings may be detected on the posterior pharyngeal wall such as hyperplasia of the lymphoid tissue on the posterior pharyngeal wall. Elimination of the irritating factor is considered to be adequate treatment, and tonsillectomy may even worsen the symptoms. Some patients who have recurrent pharyngitis may progress to chronic tonsillitis, and this disease is more common in adult patients [7]. In recurrent or chronic pharyngitis, numerous aerobic and anaerobic bacteria are found in the tonsil follicles, some of these microbes are potentially pathogenic. Many bacteriological studies of the palatine tonsils and adenoids have been done. Surface swabs and tonsil core tissues varied from each other individually in about 30% of patients with recurrent

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

tonsillitis, but the range of species isolated was the same in both surface and core samples [8,9].

Patients and Methods

Collection of samples

This study was conducted in Ear, Nose and Throat (E.N.T) outpatient clinic of Baquba Teaching Hospital as a cross sectional study including 100 patients attending the hospital during the period from August 2015 to March 2016. The study inclusion criteria included three or more pharyngitis episodes in the last 6 months or at least four episodes in the last 12 months. All patients were examined by E.N.T specialist doctor and background data on patient characteristics, risk factors and pharyngitis history were obtained. The number of female cases were (42) with an age average of 19 to 55 years, while the number of male cases were (58) with an age range of 16 to 70 years. To obtain more accurate data, the history points were (name, age, gender, number of attacks per years, duration of attack, exacerbation factors, relieving factor, treatment of each attack, associated diseases, as well as asking the patient if he takes any antibiotic during the last 3 days (to confirm the precision of the culture).

Bacteriological examination

A deep throat swab sample was taken by a medical professional doctor and was obtained from the surface of the posterior pharyngeal wall and both palatine tonsils. The pharyngeal swabs were collected carefully by using sterile cotton swabs. Gram staining was used for all samples and no specimen was rejected because of contamination. The media used for inoculation were 5% sheep blood agar, chocolate agar and MacConkey agar, agar plates were incubated at 35 °C for at least 72 hours, observed for growth of pathogens and get the final results of the culture. Identification of *Streptococcus pyogenes* and *Staphylococcus aureus* were done after culture on agar plates by colony morphology, β -haemolysis on blood agar and Bacitracin susceptibility. Incubation of the culture media, isolation and biochemical tests for detection of the other bacteria species were done by standard microbiological methods [19,20].

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

Statistical analysis

Values were expressed as number and percentage of distribution for the age, gender and causative agent.

Results

In this study, a total of 100 swab samples taken from the throats of patients with recurrent pharyngitis. As shown in Table (1), the number of male cases were (58) with an age range of 16 to 70 years. Most male cases were between 21 to 30 years (28 cases), while only 2 cases aged 51 to 60 years were collected. The number of female cases were (42) and their age were between 19 to 55 years. The majority of female cases were aged 21 to 30 years (17) while only 1 case was in the age group 61 to 70 years.

Table 1: Age wise gender distributions of collected cases.

Gender/age (years)	Total	11-20	21-30	31-40	41-50	51-60	61-70
Male	58	7	28	12	5	2	4
female	42	3	17	9	7	5	1

In a total of 100 patients with recurrent pharyngitis enrolled in this study, the swab smears demographic distribution showed that 53 cases have normal flora (53%), 25 cases *Streptococcus pyogenes* (25%), 5 cases of *staphylococcus aureus* (5%), one case of *pseudomonas* (1%), one case with *Corynebacterium diphtheria* (1%) and 5 throat swabs showed *E.coli* (5%). In addition, we found that there was no growth in 10 cultured swab smears (10%) (Table 2).

Table 2: The most common bacterial species isolated from adults with recurrent pharyngitis.

Bacteria	Number of cases (Total 100)	Percentage
<i>Streptococcus pyogenes</i>	25	25%
<i>Staph.aureus</i>	5	5%
<i>E.coli</i>	5	5%
<i>Pseudomonas</i>	1	1%
<i>Corynebacterium diphtheria</i>	1	1%
Normal flora	53	53%
No growth	10	10%

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

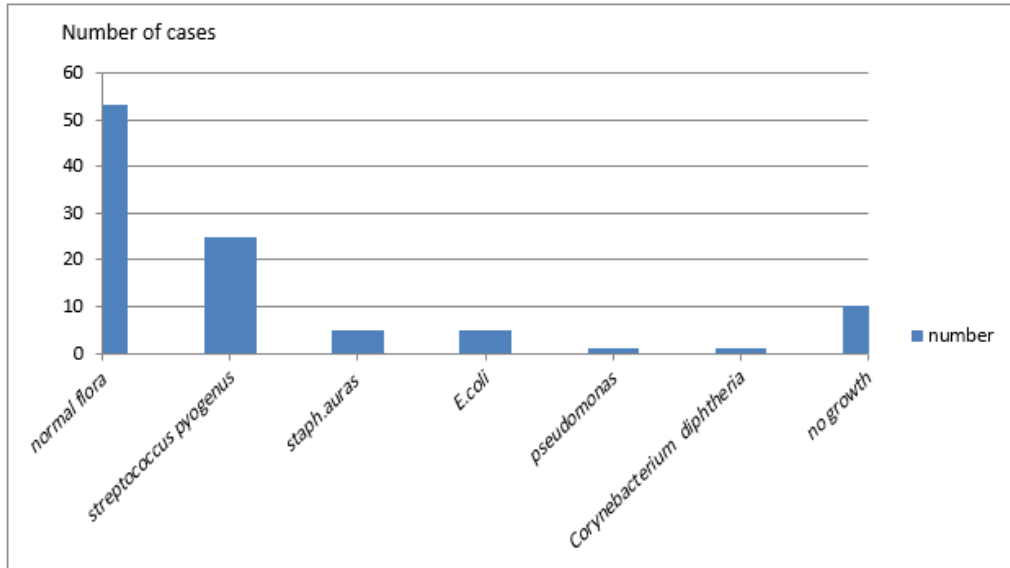


Figure 1: The number of cases and microorganisms isolated from pharynx. The vertical column shows the number of collected cases, while the horizontal column shows the types of isolated bacteria.

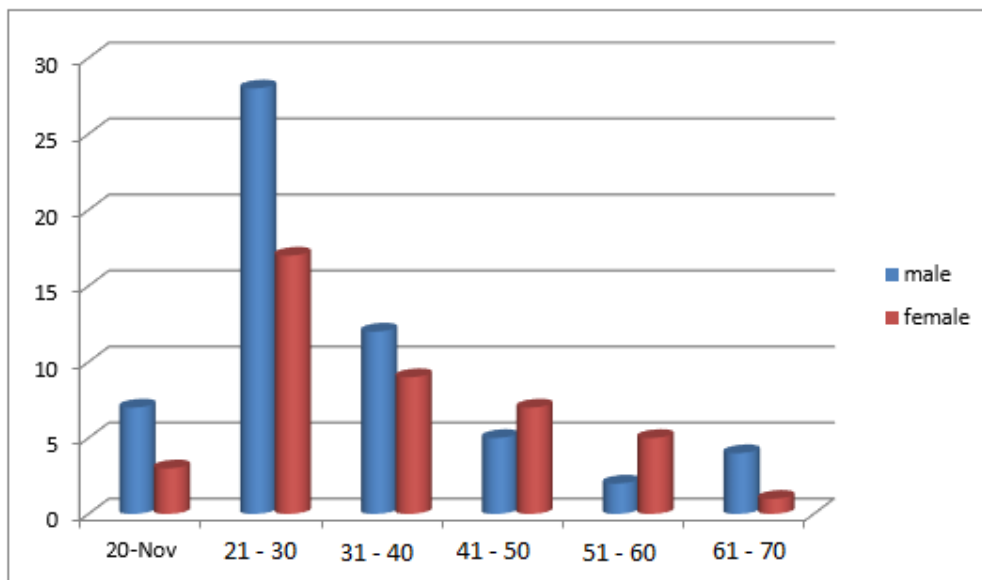


Figure 2: The number of cases, age and gender distribution. The vertical column shows the number of collected cases, while the horizontal column shows the age and gender distributions.

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

Furthermore, in this study we found that most patients have used Cephalexin, Macrolides such as Clarithromycin, and Azithromycin in the treatment of each attack. The most common diseases associated with recurrent pharyngitis were chronic sinusitis and tonsillitis. In addition, the most exacerbation factors were spicy foods and cold fluids, while the most relieving factor was hot soft fluids.

Discussion

Many studies have been done about bacteriology of recurrent tonsillitis but few have been written about recurrent pharyngitis especially in adult population [3,5,10]. According to our findings, the medical visit rate for adult patients with recurrent pharyngitis, was higher in men than in women. In fact, more than half of the patients in this study who are referred to an ENT specialist were male. It may be hypothesized that women in general may be more complaint to healthcare advice and may seek medical attention more often [11]. In contrast, this study showed that men more obedient than women. These findings may be due to recurrent episodes of streptococcal pharyngitis and episode related factor such as age and tobacco smoking, which are more common in men than women [12] In addition, *Many studies demonstrated that Streptococcus pyogenes* (group A β -hemolytic streptococci, GAS) is a re-emerging pathogen worldwide and one of the major challenges for public health. Most commonly, GAS infections are observed in the pharynx. It is found in about 5-17% of adults with acute pharyngitis and it is the only causative microbial agent of acute pharyngitis warranting antibiotic therapy [13,14,15]. The present study showed that the most common isolated pathogenic bacteria from the pharynx was *S. pyogenes* (25%). Consequently, according to our finding, adult patients with recurrent pharyngitis may benefit from cultures. Therefore, this study elaborates that streptococcal testing is appropriate for treating cases of recurrent pharyngitis.

There are relatively few studies on the normal microbial flora of the oropharynx of patients with recurrent pharyngitis [11,16]. The normal flora of the pharynx include a large number of microbial species that should be neither fully identified nor reported when observed in throat cultures [17]. We found more than 53% of cultures were normal flora.

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

According to the background of our patient, 53% of them experienced sinusitis and this finding is in agreement with the results of other studies that showed most cases of recurrent pharyngitis have higher consultation rate with specialist for consultation of paranasal surgery due to recurrent acute rhinosinusitis [18].

Conclusion

This study suggests that adult patients with more than three attacks of chronic or recurrent pharyngitis per year can benefit from a pharyngeal swab to quickly detect pathogenic bacteria and choose the appropriate treatment with effective antibiotics. The present showed that *Streptococcus pyogenes* (GAS) was the commonest microorganisms in adult population. These results point out the need for continuous investigation of GAS and non-GAS bearing as well as the antibiotic resistance in adult population and other age groups such as school-aged children. Furthermore, the selected adult patients who have recurrent pharyngitis episodes also had recurrent attacks of acute sinusitis and tonsillitis.

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

References

1. Baidaa R D. and Saad S H. Antibiotic susceptibility of *Streptococcus pyogenes* and *Staphylococcus aureus* isolated from Pharyngitis and Tonsillitis patients in Nasiriyah City, Iraq. World Journal of Pharmaceutical Sciences. 2016; 4(4): 2321-3086.
2. Gastón D, Mónica S, Beatriz B, Gisela P, and Leonardo G A. Throat Carriage Rate and Antimicrobial Resistance of *Streptococcus pyogenes* In Rural Children in Argentina. Journal. of preventive medicine & public health. 2017; 50(2): 127–132.
3. Timo K. Outcome after tonsillectomy adult patient with recurrent pharyngitis: Recurrent pharyngitis; Acta Univ. Oul. D 1294, 2015.
4. Khosravi Y, Ling LC, Loke MF, Shailendra S, Prepageran N, and Vadivelu J. Determination of the biofilm formation capacity of bacterial pathogens associated with otorhinolaryngologic diseases in the Malaysian population. Eur Arch ORL. 2014 May;271(5):1227-1233.
5. Tupai-Firestone R, Tsai JY, Anderson P, Broome L, McKee T, and Lennon DR. Antimicrobial stewardship using pharmacy data for the nurse led school based clinics in Counties Manukau District Health Board for management of group A streptococcal pharyngitis and skin infection. N Z Med J.2016;129(1435):29-32
6. Ebell MH, Smith M A, Barry H C, Ives K, and Carey M. The rational clinical examination, does this patient have strep throat?.JAMA. 2000; 284 (22): 2912-2918.
7. Pichicher M E, Group A streptococcal tonsillo-pharyngitis, Cost effective
8. diagnosis and treatment. Ann. Emerg. Med; 1995 25(3): 390-403.
9. Sauver JL, Weaver AL, Orvidas LJ, Jacobson RM, and Jacobsen S J. Population based prevalence of repeated group A Beta hemolytic streptococcal pharyngitis episodes. Mayo Clin. Proc.2006; 81: 1172-1176.
10. Cooper RJ, Hoffman JR, Bartlett JG, Besser RE, Gonzales, R and Hickner JM, et al. Principles of appropriate antibiotic use for acute pharyngitis in adults background. Ann Intern Med 2001; 134: 509- 512.

Isolation of Bacteria from Adult Patients with Recurrent or Chronic Pharyngitis in Baquba Teaching Hospital

Duraid Hameed Abid Alkadem

11. Linder J.A, Bates D. W, Lee G.M, and Finkelstein J A. Antibiotic treatment of children with sore throat. JAMA. 2005; 294: (18) 2315-2322.
12. Xu Y, Hua Q, Zhou T, W Y, and Chen G. Analysis of bacterial culture and C. pneumoniae DNA detection of chronic pharyngitis. Lin Chuang Er Bi Yan Hou Ke Za Zhi. 2004 ;18(3):136-138.
13. Kurien M, Stanis A, Job A, Brahmadathan, and Thomas K. Throat swab in the chronic tonsillitis how reliable and valid is it?. Singapore Med J. 2000;41(7):324-326.
14. Enin IP, Baturin VA, Shchetinin EV, Karpov V.P, and Enin IV. Microflora of palatine tonsils in chronic tonsillitis. Vestn ORL. 2013;(4):21-22.
15. Omer N D, Havva D I, Hrisi B, Gunay C, Mehmet K, and Gokhan A. Bacteriological evaluation of tonsillar microbial flora according to age and tonsillar size in recurrent tonsillitis. European Archives of Oto-Rhino-Laryngo. 2014; 271 (6): 1661–1665.
16. Loganathan A, Arumainathan U. D, and Raman R. Comparative study of bacteriology in recurrent tonsillitis among children and adults Singapore Med J. 2006 ;47(4):271-275.
17. Lindroos R. Bacteriology of the tonsil core in recurrent tonsillitis and tonsillar hyperplasia a short review. Acta Otolaryngo Supp. 2000;543:206-8.
18. Pontin IP, Sanchez DC, and Di Francesco R. Asymptomatic Group A, beta-hemolytic Streptococcus carriage in children with recurrent tonsillitis and tonsillar hypertrophy. Int J Pediatr ORL. 2016;86:57-9.
19. Mitchelmore IJ, Reilly PG, Hay AJ, and Tabaqchali S. Tonsil surface and core cultures in recurrent tonsillitis, prevalence of anaerobes and beta lactamase producing organisms. Eur J Clin Microbiol Infect Dis. 1994 Jul;13(7):542-548.
20. 19 Fordes A, Betty S, Daniel and Weissfeld S A. Bailey and Scott's Diagnostic Microbiology. 2007; 12.
21. Holt, J.G, Krieg N.R., Sneath P.H.A., Staley J.T and Williams. S.T 1995. Bergy, s Manual of Determinative Bacteriology. 9th.ed. Williams &Wilkins, USA. P.410-560.