ORIGINAL ARTICLE

"Bacterial or Viral" Is Age an Indicator in Acute Suppurative Tonsillitis

Rajesh, Paretik Bakashi*, M.Chatterji**

Abstract

Group A ß-hemolytic streptococci (GABHS) is the most frequent bacterial cause of acute suppurative tonsillitis. Antimicrobial agents are required only in the bacterial acute suppurative tonsillitis. So it becomes must to determine the cause of acute suppurative tonsillitis and to institute the appropriate antibiotic therapy thus avoiding use of costly antibiotics in case of nonbacterial etiology. In our study 44 children were diagnosed as having acute febrile suppurative tonsillitis with the etiologies of Gr. A streptococci, adenovirus and Epstein-Barr (EB) virus. There were 20 cases of adenoviral tonsillitis, 15 cases of Epstein-Barr viral tonsillitis and 09cases of Gr. A Streptococcal tonsillitis. The aim of this study was to find out whether the serum C-reactive proteins (CRP), peripheral WBC counts and the age of the patient could make an influence in differentiating the etiological agent in acute tonsillitis. There was no significant difference between adenoviral and streptococcal groups, in the measurement of serum (CRP) or peripheral WBC count. Patients with Gr. A streptococcal tonsillitis were significantly older than EB-viral or adenoviral tonsillitis ($p < 0.05$).Sixty six per cent of patients with adenoviral tonsillitis were under 4 years of age, 67% of the patients with EB-viral tonsillitis were under 6 years of age, whereas 71% of the patients with streptococcal tonsillitis were over 6 years of age. Based on clinical examination, serum CRP and peripheral WBC cannot differentiation between bacterial or viral cause of acute suppurative tonsillitis whereas age was clearly the most important factor.

Key Words

GABHS; adenovirus, Epstein-Barr (EB), C-reactive protein (CRP)

Introduction

The most common cause of acute suppurative tonsillitis include group Group A ß-hemolytic streptococci, Epstein-Barr (EB) virus and adenovirus. About 30% to 40% of tonsillitis cases are caused by Group A ß-hemolytic streptococci is documented (1). The differentiation of Group A streptococci is important as it requires specific antibiotic treatment to prevent acute rheumatic fever and acute glomerulonephritis. Where as in viral etiology only supportive treatment is required, therefore, the use of anti microbial therapy is unnecessary and costly in such cases. The random use of antibiotic promotes bacterial resistance, disturbs natural flora and may produce unnecessary side effects. The purpose of the study was to measure serum C-reactive protein, peripheral white blood cell counts and the age of the patient in demarcating between Gr. A ß-hemolytic streptococcal from viral causes.

Material & Methods

Forty Four (44) Patients of acute suppurative tonsillitis having tonsillar exudate and temperature more than 38^0C were investigated from October 2006 to March 2007. A standardized history and physical examination at the time

From the Departments of ENT,*PSM and **Microbiology,Iban Sina Teaching Hospital,Al-Tahadi University, Sirte, LIBYA.
Correspondence to : Dr Rajesh, Department of ENT & Head Neck Surgery, Iban Sina Teaching Hospital,Al-Tahadi University, Sirte, LIBYA

of admission was recorded. Only three etiologies of acute suppurative tonsillitis, including adenovirus, EB virus and Group A ß-hemolytic streptococci were enrolled in the present study. After clinically establishing the diagnosis of acute suppurative tonsillitis, the blood sample and throat swab specimens for the analysis were collected. The diagnosis of adenoviral tonsillitis was based on direct qualitative detection of adenoviral antigen from throat swab specimens by enzyme immunoassay (EIA). EB-viral tonsillitis was diagnosed by positive viral capsid antigen (VCA) IgM and EB virus by indirect immunofluorescence (IFA) in serum. The method of GABHS rapid diagnostic kits (ABBOTT Test Pack), a rapid immunoassay for the qualitative detection of Gr. A streptococcal antigen from throat swab specimens was used for diagnosis of Gr. A streptococcal tonsillitis. Throat swab specimens were collected in Stuart's medium for inoculation on 5% sheep blood agar plates, and ß-hemolytic streptococci were grouped by latex agglutination tests. The throat swab specimens were inoculated into human embryonic lung fibroblast (HEL) for virus isolation and blood for peripheral WBC counts and CRP was collected at the same time. The measurement of CRP was performed by particle-enhanced immunonephelometry.

Results

44 children with acute suppurative tonsillitis were diagnosed as having adenoviral, EB-viral and Gr. A streptococcal tonsillitis. The profile including age, serum CRP and peripheral WBC counts are shown in figures and table formats. The etiological agents of tonsillitis were adenovirus in 20 cases, EB virus in 15 cases, and Gr. A streptococcus in 09 cases. There were 34 boys and 10 girls, aged from 1 year to 16 year. No significant relation was found between adeno virus and EB virus with the age group (at $p < .05$, $t=2.038$) (Fig.1). Age difference was significant in adeno virus and streptococcal tonsillitis ($p <.05$, $t = 2.721$) (Fig.2).A significant relation between the age group and EB virus and streptococcal tonsillitis was found ($p <.05$, $t = 2.338$) (Fig.3).WBC count 12,500 mm3 was found in 31 of adenovirus, 58% of EB virus and 61% of streptococcal tonsillitis respectively. There was no significant difference in WBC count among these groups (Table-1). The CRP value (Table-2) in streptococcal tonsillitis was significantly high than EB virus group ($p <.05$). Where as there was no significant difference between adeno virus and streptococcal tonsillitis group. The WBC count 13,000 mm3, CRP value around 4.3mg/dl and age more than 6 years was found in streptococcal tonsillitis. In EB virus CRP value was found less i.e. 1.68 mg/dl, age group was 2.8 years but WBC count was more i.e. 14000 mm3. In adeno virus age group was 1.8 years and WBC count was low 11.900 mm3 but CRP value was 4.4/dl.Thus it can be concluded that any of the two values out of three (Age, CRP and WBC count) values positive should reach to the diagnosis of acute streptococcal tonsillitis. Further, it can be said that if the age of the patient is more around 7 years than it should be treated with antibiotics where as if the age of the subject is less than 6 years supportive treatment should be given.

Fig: 1 Adenovirus Vs EB Virus

t=1.038 at p<.05

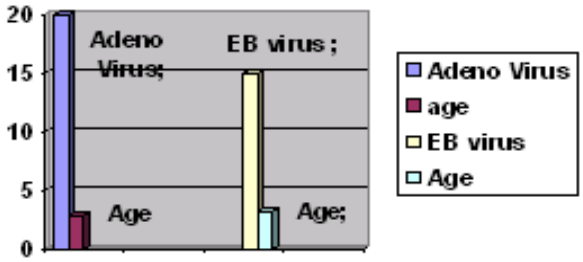

Fig: 2 Adenovirus Vs Streptococal

t=2.721 at p<.05

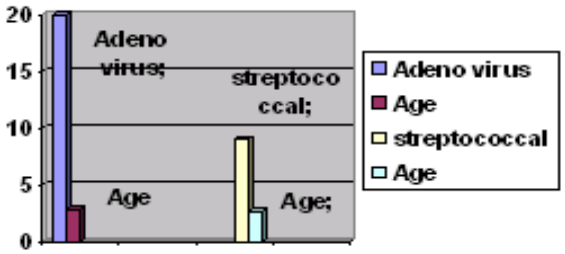

Fig: 3 EB Virus Vs Streptococal

t=2.338 at p<.05

Table 1: WBC count

	No.of patients	value$X10^9$/l
Adeno virus	20	11.9 ± 3.80
Epstein Barr virus	15	14.0 ± 5.97
Group A Streptococcus	09	13.0 ± 4.2

Table 2: CRP Value

	No.of patients	Value mg/dl
Adeno virus	20	4.4 ± 3.0
Epstein Barr virus	15	1.6 ± 1.9
Group A Streptococcus	09	4.3 ± 1.9

Discussion

Much work has been done to differentiate acute suppurative tonsillitis between streptococcal versus viral etiology. It has been observed in our study that CRP value =4mg/dl was found in 48% of streptococcal tonsillitis and 45% and 8% in adeno and EB viruses respectively. Where as an other study showed CRP value of > 20 mg/l in 32 % of patients of viral tonsillitis. It has been observed that CRP is frequently positive (78%) in serum of patients with streptococcal tonsillitis (2). Thus CRP is not a useful tool in differentiating the etiology acute suppurative tonsillitis. Breese *et al* (3) has observed a WBC count > 12,000 mm^3 is indicative of GABHS this is similar to our observation of 13,000mm^3 WBC count in GABHS. In Stillerman *et al* (4) opinion, elevated WBC counts were indicative of streptococcal tonsillitis. In the present study, however, the measurement of WBC is of no use in differentiating the etiologies of acute suppurative tonsillitis, in agreement with other studies. In the present study, 67% of the patients with EB-viral tonsillitis were under 2.8 years of age, which does not agrees with the previous finding of Putto *et al*.(5) and Siegel *et al* (6). Obviously EB virus infection is more common in young children. Gr. A streptococcal tonsillitis occurs mostly in school-age children. Seventy-one percent of patients with Gr. A streptococcal tonsillitis were over 6 years of age and only 14% were under 3years of age. The largest proportion (15% to 40%) of children who had suppurative tonsillitis had viral infection. 67 per cent of the patients with adenoviral tonsillitis in this study were 1.8 years of age. The frequencies of children with acute suppurative tonsillitis of variable etiologies, by age, are shown in figures. The GABHS antigen detection tests can be performed quickly in the clinic at the cost less than 10-day therapy of penicillin. If applied properly, the sensitivity is re ported to range from 79%-87% with the specificity of 90%-96% (7). Therefore, positive result from rapid GABHS test can be deemed reliable and treated appropriately. From the cost-effectiveness analysis, the conclusion is reached that the use of a rapid streptococcus test followed by confirmatory culture if necessary is the best approach (8,9,10).

Conclusion

Age is the most important reliable variable to predict the etiology of acute suppurative tonsillitis where as serum CRP, peripheral WBC count and clinical picture have limited diagnostic parameters. The decision to treat acute suppurative tonsillitis must be made in the following directions i.e. rapid streptococcus test especially for those who are at school going age , have typical clinical picture and WBC count > 13,000 mm3 with a shift to the left. . These patients should be given a shot of intramuscular benzathine pencillin. Where as in patients with inappropriate diagnosis of acute suppurative tonsillitis should be only treated with supportive treatment,thus avoiding the use of broad spectrum antibiotics which may lead to bacterial resistance and unwanted side effects.

References

1. Syrylo A, Wojdas A,Jukiewicz D.Bacterial Flora of the Tonsillar Surface versus Tonsillar Core in Chronic Tonsillitis. *Otolaryngal Pol* 2007; 61(4): 598-601
2. Kaplan EL, Wannamaker LW. C-reactive protein in strepto-coccal pharyngitis. *Pediatrics* 1977; 60:28-32
3. Breese BB.A simple score card for the tentative diagnosis of streptococcal pharyngitis. *Am J Dis Child* 1977;131:514-7.
4. Stillerman M, Bernstein SH. Streptococcal pharyngitis. Evaluation of clinical syndromes in diagnosis. *Am J Dis Child* 1961; 101:476-89
5. Putto A, Meurman O, Ruuskanen O.C-reactive protein in the differentiation of adenoviral, Epstein-Barrviral and strepto-coccal tonsillitis in children. *Eur J Pediatr* 1986; 145:204-6.
6. Siegel AC, John son EE, Stollerman GH. Con trolled studies of streptococcal pharyngitis in a pediatric population. *N Engl J Med* 1961; 265:559-66.
7. Kaplan EL. The rapid identification of group A beta-hemolytic streptococci in the upper respiratory tract. *Pediatr Clin N Am* 1988; 35:535-42.
8. Raz R, Bitnun S. Dilemmas of streptococcal pharyngitis. *Am Fam Phys* 1987; 35:187-92.
9. Lieu TA, Fleisher GR, Schwartz JS. Cost-effectiveness of rapid latex agglutination testing and throat culture for streptococcal pharyngitis. *Pediatrics* 1990; 85:246-56.
10. Tompkins RK, Burnes DC, Ca ble WE. An analysis of the cost-effectiveness of pharyngitis management and acute rheumatic fever prevention. *Ann Intern Med*1977; 86:481-92.