How to Cite:
Al-Garaguly, O. A. S. (2022). Blood parameters may help in the detection of acute tonsillitis?. *Linguistics and Culture Review*, *6*(S4), 191-195. Retrieved from https://lingcure.org/index.php/journal/article/view/2233

Blood Parameters May Help in the Detection of Acute Tonsillitis?

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***Abstract*---**Acute tonsillitis is a five or more episodes of true tonsillitis in one a year or symptoms of tonsillitis for at least one year. This study was determined hematological values helping in diagnosis in cases with acute tonsillitis. An observational study done over one years from Nov 2021 to Nov 2022. Study sample included admitted patients (n= 100) with tonsillitis. Demographical data, and blood samples had been drawn from all for estimation of hematology parameters post tonsillectomy. Prior to tonsillectomy, a two milliliters of venous blood collected into tubes for testing. All variables were insignificantly different, however, previous attack have high statistical significant (P<0.01). In brief a significant difference between two groups were found for WBC, LYM, NEU, PLT, and Hb plus PCV. The use of the complete blood parameters are sensitive for diagnosis of tonsillitis. Male, obese, poor, low educated, and positive family history, have negative predication effect on occurrence of tonsillitis. Frequent attacks of tonsillitis have positive predictive effect on incidence of tonsillitis.

***Keywords*---**acute tonsillitis, hematological parameters, blood, tonsillectomy.

Introduction

Anatomically speaking, tonsils are in upper part of the upper respiratory system as secondary lymph organ located in the back on both sides at the end of throat [1]. The tonsils were organized in the pharynx as a ring known as the Waldeyer's ring, which is the first defense part in the body against various microorganism like bacteria and virus [1-3]. Mostly tonsillitis caused by Group A beta-hemolytic *Streptococcai* and *Staphylococcus aureus* [4]. The definition of severe tonsillitis as: five or more episodes of true tonsillitis a year; symptoms for at least one year; and episodes that are disabling and prevent individual from normal functioning [5]. The diagnosis of acute tonsillitis is primarily clinical [6]. The incidence of

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Manuscript submitted: 9 Agst 2022, Manuscript revised: 18 Nov 2022, Accepted for publication: 27 Dec 2022

tonsillitis in general practice in world of 15000 per 100000 population per year [7]. Pediatric acute tonsillitis is more common than adulthood [6-9]. The most common complication of acute tonsillitis are peritonsillar abscess, rheumatic fever and acute glomerulonephritis [6].

The bacterial tonsillitis caused by group A β-hemolytic streptococci (GABHS) or *Streptococcus pyogenes* [8]. Whereas, viral tonsillitis caused by human adenoviruses, Epstein Barr Virus, Human Boca Virus, influenza and para-influenza viruses, rhino-viruses, Coxsackie viruses, corona viruses, respiratory syncytial virus (RSV), human meta-pneumo-virus, human immunodeficiency viruses (HIV) [8, 9]. Antibiotic therapy and surgical tonsillectomy are the main steps of management of tonsillitis [8]. Therefore, the present study aimed to determine the level of hematological tests help in diagnosis of tonsillitis.

Methods

An observational study done over one years. Study sample included admitted patients (n= 100) with clinical diagnosis of tonsillitis. All cases were interviewed for obtaining demographical data, and blood samples had been drawn from all participants for estimation of CBC parameters and after tonsillectomy. Prior to tonsillectomy, a 2 ml of venous blood collected into EDTA tubes and tested. Statistical Package for the Social Sciences (SPSS) V20 (IBM Corporation, Armonk, NY, USA) were used. Data presented as tables (counts, percentage, and means). P-value considered significant if it was less than 0.05.

Results

Table (1) listed the demographic distribution in this study. All variables were insignificantly different, however, previous attack have high statistical significant (P<0.01). In brief a significant difference between two groups were found for WBC, LYM, NEU, PLT, and Hb plus PCV (P<0.01), Table (2).

Table 1. Demographic of the study

Variables		Acute tonsillitis (n=100) No. / mean±SD
Age		15.65±9.33
Gender	Male	58
	Female	42
Residency	Urban	55
	Rural	45
Education	Good	44
	Fair	56
Income	High	30
	Low	70
Previous attack	Yes	29
	No	71
Family	Yes	17

history	No	59
Smoking	Yes	23
	No	53

Table 2: Distribution of CBC parameters

Blood Test	Acute tonsillitis Mean ±SD
WBC ($10^3/\mu L$)	16.55±6.29
LYM ($10^3/\mu L$)	4.68±2.89
NEU ($10^3/\mu L$)	11.44±6.78
Hb (%)	11.76±4.23
PCV	33.52±2.97
PLT ($10^3/\mu L$)	300.11±88.39

Discussion

Previous history, clinical symptoms and laboratory tests are used for diagnosis and the isolates of *S. pyogenes* and *S. aureus* are occur in acute tonsillitis [10]. Age was insignificantly difference the development of tonsillitis. Male gender is mostly affected than female. Residency, education, income, smoking and family history are uninfluenced the condition. However, previous attack have a high statistical difference ($P<0.01$). These are agreed with Babaiwa et al.[4], Abidali [11], and Dakhil et al.[12]. WBC counts are significantly raised in an infection. A decreased LYM counts are significantly associated with clinical diagnosis of tonsillitis. Neutrophil counts are elevated in cases of acute tonsillitis significantly. These are disagree with Sakat et al. [13], Ocal et al.[14], Furuncuoglu et al. [15], and Stelter [16].

Abd ALaziz et al., [16] indicated an increase in the total number of white blood cells in cases with acute and chronic tonsillitis compared with the control group and this observed is an agreement with [17]. Also there was a significant increase in the number of neutrophils may be due to the fact that neutrophils are the first line of defense of the body which is the first self-defense elements against bacterial invasion and the main purpose is to distinguish and Absorbing and killing invading organisms such as bacteria. and the infection of the tonsils lymphatic tissue with bacteria lead to migration of monocyte from the blood stream to inflamed site and it may lead to increase in the number of monocyte [18, 19]. The penetration of invading organisms such as bacteria into the body led to changes in the ratio of total and differential levels of white blood cells as a result of the immune defense against invasive organisms [20, 21].

Conclusion

The use of the complete blood parameters are sensitive for diagnosis of tonsillitis. Male, obese, poor, low educated, and positive family history, have negative predication effect on occurrence of tonsillitis. Frequent attacks of tonsillitis have positive predictive effect on incidence of tonsillitis.

Funding
None

Conflict of interesting
None

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