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Serum level and interleukin 9 genetic polymorphisms

In patients with tonsillitis

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Abstract
The study investigated the relationship between the polymorphism of the IL-9 gene at position -6676 for the variation rs1799962 for tonsillitis among patients in Baquba, which included 31 male samples with an average age of (15.65 ± 1.79) years compared to 5 healthy males with an average age (14.66 ± 3.43) years enrolled in this study the polymorphism of IL9$_{-6676}$ was data waved by polymerase chain reaction-specific sequence primer (PCR-SSP) assay. As the results of the electrophoresis of the IL- 9 gene at position -6676 showed a comparison *genotypes* & *alleles* between tonsillitis patients & controls frequencies of AA genotype & A *allele,* showed that a significant increase in patients with tonsillitis (45.16% and 72.58% P =1.000 respectively) Compared to the control (70% and 40% P= 0.431 respectively) and associated RR rates were(8.6% and 38.0% respectively.) and And the related EF values were (1.24 and 1.75). In contrast AG genotype & *G allele* (35.48 *vs.* 17.74, P =0.357 respectively). Decreased frequency was observed in patients compared to the control (30% and 60% P =0.431) , and the related PF values were (0.37 and 0.57 respectively). The results of the study indicate that IL9$_{-6676}$ SNP may have a role in the mechanism of etiopathogenic. It was observed that it has a negative and positive role in the samples with tonsillitis in the samples of Iraqi patients

Key words: Single Nucleotide Polymorphism, *Interleukine-9.* Tonsillitis.

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Introduction

The tonsils are the two lymph nodes that are located on either side of the back of the throat. They act as a defense mechanism, helping to prevent infection from entering the body. Tonsillitis is easy to diagnose and treat (Shantinath, 2015). Tonsillitis is common (15-40%) among children and (5- 15%) among adults (Shaikh, others 2010). About 11 million people annually in the United States become infected with pharyngitis. The largest group in which streptococcus pharyngitis is prevalent, by 15 to 40% among children and by 5 to 15% among adults, and these cases often occur in late winter and early spring. Tonsils are organs in which immunity is

regulated where allergen-specific regulatory T cells can be generated by mechanisms that rely on plasmodendritic cells (Choby, 2009; Shulman et al., 2012) and are considered the host's first line of defense against pathogens, but it is also a place with processes Recurrent chronic inflammatory.

It is predominant in tonsillitis, initiates production of Th1 cytokines, including IFN-and TNF-α, and then on secretion of Th2 type cytokines the elevated concentration of TNF-α, IL-1, IL-6, IL-9, and IL-13 in tissues is As a result of the overproduction of inflammatory cytokines due to the activation of single-celled macrophages resulting from repeated stimulation by pathogenic agents (Mikola, 2018). IL-9 plays a critical role in inflammatory diseases such as asthma, atopic dermatitis, systemic lupus erythematosus and rheumatoid arthritis. The anti-inflammatory or anti-inflammatory function of the IL-9 source depends on the role of the IL-9 secretion source and the stage of the disease. For all previous information present study focused on Interleukins 9 .

Materials and Methods

Subjects

The current study was conducted on a group of patients attending Baqubah Teaching Hospital / Consulting Clinic. Blood samples were obtained for patients with tonsillitis from Baqubah district, and samples were collected for the period from 1-5-2020 until 1-8-2020, and the number was (31) samples, and all cases in the study included only males in addition to 5 healthy controls males. Blood samples were collected in EDTA. The specimens were stored in deep freeze at -20°C. tonsillitis patients and randomly collected healthy controls (HC). The patients age range was 15.65 ± 1.79 years compared subject of health's controls was 14,66 ±3,43 years, were record in the study.

Detection of IL9 rs1799962 Polymorphism

Genomic DNA was extracted from EDTA blood using G- spin TM Total DNA Purification Kit (G-SPIN USA) followed by electrophoresis on 2% agarose-gel by CTS-PCRSSP Tray Kit (Maxime PCR PreMix USA).

Statistical Analysis

Genotypes of IL9$_{-6676}$ SNP were presented as percentage frequencies, These estimations were calculated by using the WINPEPI computer programs for epidemiologists. The latest version of the WINPEPI package is available free online at http://www.brixtonhealth.com.

Rustles:

SNP of IL9gene was determined in the promoter region at position $_{-6676}$ (IL9$_{-6676}$ SNP), it was presented with three genotypes (AA, AG and GG) that correlate with two alleles (*A* and *G*). Among Tonsillitis patients, no significant difference was observed between the observed and expected frequencies of the three genotypes (a good agreement with Hardy-Weinberg equilibrium; HWE), However comparing patients to controls results some significant differences (Table -1).

The frequencies of AA genotype and *A* allele were significantly increased in patients (45.16% and 72.58%, respectively) compared to controls (70% and 40% respectively). The relative risks (RRs) of such positive associations were 8.6% and 38.0% respectively. In contrast, AG genotype & *G* allele frequencies were significantly decreased in patients (35.48 *vs*. 17.74, respectively) compared to controls (30% and 60%, respectively). The preventing fractions (PFs) of such negative associations were 0.37 and 0.57, respectively). (Table 2).

Table 1: numbers and percentage frequencies and Hardy-Weinberg (H-W) equilibrium of (**IL9-6676 rs1799962**genotypes and alleles) in tonsillitis patients and controls.

Groups			**IL9-6676 Genotypes or alleles**					**H-W X^2 P ≤**
			AA	**AG**	**GG**	***A***	***G***	
tonsillitis (No. = 31)	**Observed**	**No.**	**14**	**11**	**0**	**45**	**11**	**0.22**
		%	**45.16**	**35.48**	**0**	**72.58**	**17.74**	
	Expected	**No.**	**16.33**	**7.98**	**0.98**	**Not Estimated**		
		%	**52.68**	**25.75**	**3.15**			
Controls (No. = 5)	**Observed**	**No.**	**2**	**3**	**0**	**7**	**3**	**0.33**
		%	**60**	**40**	**0**	**70**	**30**	
	Expected	**No.**	**2.45**	**2.1**	**0.45**	**Not Estimated**		
		%	**49**	**42**	**9**			

Table 2-: Statistical analysis of associations between IL9-6676 rs1799962 genotypes or alleles in tonsillitis patients and controls. .

Type of Comparison	**Statistical Evaluation.** **IL9-6676 Genotype or Allele**	**Relative Risk.**	**Preventive or Fraction Etiological.**	**Fisher's Exact Probability**	**95% Confidence Intervals**
tonsillitis Disease Versus Controls.	**AA**	**8.6%**	**1.24**	**1.000**	**7.07 -0.22**
	AG	**38.0%**	**0.37**	**0.357**	**2.12 -0.06**
	GG	**0**	**0**	**0**	**0**
	A	**34.5%**	**1.75**	**0.431**	**0.42 - 7.40**
	G	**12.9%**	**0.57**	**0.431**	**0.14 - 2.41**

Discussion:

The results of the current study, as shown in Table (1-4), showed that the identical genotype AA and allele A recorded a significant increase in the group of patients with tonsillitis and present study illustrated that **IL9-6676 rs1799962** important genetic marker in the "pathogenesis of tonsillitis especially if we consider RR values was

(8.6% and 38.0%), respectively, was showed that frequency of AA genotype and *A allele* (**45.16%** and **72.58%;** P =**1.000** respectively) were significantly rise in patients contrast to controls, (**07%** and **40%** respectively; P=**0.357**), and the associated EF values were **1.24** & **1.75**, respectively. In contrast, AG genotype and *G allele* (**35.48** and **17.74**, respectively P= **0.357** respectively) frequencies were significantly decreased in patients, compared to controls (**30% and 60%,** respectively; P=**0.431**), and the associated PF values" were **0.37** and **0.57** respectively. The presented results strongly suggest that IL9$_{-6676}$ rs1799962 polymorphism is involved in tonsillitis in terms of susceptibility (positive association) and protection (negative association). The current study did not agree with the study conducted by the researcher (Fatahi et al. 2016), which indicated that the IL-9 in the homozygous genotype AA has a protective effect or protection from the risk of developing rhinitis respiratory disease in women in Iran because of its low frequency in infected patients. This mean genotype in this singlenucleotide polymorphisms can effect the level of IL-9 in serum in asthmatic patients (Turner et al.,2013). Unfortunately, such polymorphism has not been investigated in tonsillitis.

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