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GENOTYPING OF *IL13*-1024 (C/T) GENE AMONG IRAQI THYROID GOITER PATIENTS

Ameer M. Jafar[1]*, Ihsan A. Hussein[1], Anwar I. S. Al-Assaf[1] and Tharwat I. Sulaiman[2]

[1]Department of Biology, College of Education-Ibn Al-Haitham, University of Baghdad, Iraq.
[2]Department of Surgery, College of Medicine, University of Baghdad, Iraq.
*e-mail : ameermn911@gmail.com

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ABSTRACT : This study dealt with *IL-13* 1024 (C/T) gene genotyping among patients with Thyroid goiter in Iraq. Forty blood samples from patients with Thyroid goiter were collected and compared with 30 healthy persons as controls. The genotyping results of *IL-13* 1024 (C/T) gene using ARMS-PCR revealed presence TT, CC and CT genotypes beside T and C alleles. The T allele and TT genotype frequency were higher in Thyroid goiter patients compared to the same genotype and allele in healthy persons (P = 0.060). These increasing results were related with increasing risk factor of Thyroid goiter (odds ratio [OR] 2.15; 95% confidence interval [CI] 0.99–71.4). No significant differences between genotypes for Thyroid goiter patients and controls were revealed by using Hardy-Weinberg distribution. In conclusion, Thyroid goiter increasing risk was related with the TT and TC genotypes and T allele and these are showed as etiological fraction (EF) with risk having Thyroid goiter, while the CC genotype ratio percentage in healthy persons was higher in comparisons with Thyroid goiter patients suggesting the CC genotype have preventive fraction (PF).

Key words : *IL13* -1024 (C/T) gene, thyroid goiter, ARMS-PCR, autoimmune disease.

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INTRODUCTION

Thyroid goiter is one of the autoimmune and endocrine system diseases, which includes a number of pathological conditions that leads to a functional impairment in it and thus an increase in its size (Weetman, 1996; Davies, 2000; Huber *et al*, 2008). Goiter disease arises from an interaction between environmental factors (iodine, smoking, viral and bacterial infection, pregnancy) and genetic factors (genetic predisposition to developing the disease) (Pearce and Leech, 2004). Thyroid autoimmune disease is the most common organ-specific autoimmune disease, affecting 2-5% of the world's population (Simmonds and Gough, 2004), with a large difference in their incidence between the sexes (5-15% in women and 1-5% in men) (Dayan and Daniels, 2004). Cytokines play an important role in AITDs, through its role in degrading autoimmune tolerance, presentation of autoantigens, activation of B and T lymphocytes, production of autoantibodies, and autoimmune inhibition. Given the important role of cytokines produced by inflammatory cells within the thyroid and follicular cells in the immune and inflammatory responses to disease, the genes encoding these cytokines are disease candidates (Ajjan *et al*, 1997 and Xiaoheng *et al*, 2017). Interleukin 13 (IL-13) is known to be a pluripotent cytokine produced by Th2 cells, as well as by many cells including Th1 cells, Th17 cells (Gallo *et al*, 2012), and mast cells in atopic dermatitis (Obara *et al*, 2002), eosinophils in granulomas (Reiman *et al*, 2006), basal cells (Akdis *et al*, 2011), natural killer T cells (NK) (Fuss *et al*, 2004), phagocytes in pulmonary fibrosis (Aoki *et al*, 2015). The complementary deoxyribonucleic acid-cDNA of interleukin-13 was cloned in 1993 and was shown to have single open-reading frame (ORF) with 132 amino acids (McKenzie *et al*, 1993 and Minty *et al*, 1993) and it has a 25% similarity with interleukin 4 (IL-4) at the amino acid level (Chomarat and Banchereau, 1998). *IL-13*-1024 (C/T) gene encoding IL-13 was located 12 kilobases from the gene encoding IL-4 and consists of 4 exons and 3 introns (Smirnov *et al*, 1995) at location (5q23-31) (Minty *et al*, 1993). IL-13 plays a major role in asthma and allergy diseases (Vladich *et al*, 2005; Lee *et al*, 2016; Doran *et al*, 2017) and several autoimmune diseases (Spadaro *et al*, 2002; Wang *et al*, 2018). This work was dealt with

CC genotype. Presence of two bands in both lanes refers to the TC genotype.

CONCLUSION

The Thyroid goiter increasing risk was related with the TT and TC genotype and T allele and these were showed as EF with having a risk with Thyroid goiter, while the CC genotype and ratio percentage of C allele in healthy persons was higher as compared to patients with Thyroid goiter suggesting that this genotype have a PF.

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