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Molecular analysis of *ERAP1* allelic variations in patients with ankylosing spondylitis

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Background: Ankylosing spondylitis (AS) is a chronic inflammatory arthritis; a type of seronegative spondyloarthropathies. AS typically affects the joints of the spinal and axial skeleton. Among the non-HLA predisposing loci, the strongest association has been observed for single nucleotide poly-morphisms (SNPs) of endoplasmic reticulum amino peptidase *ERAP1* gene. *ERAP1* reduces the ability of signal transmission by cleaving cytokine receptors which affects the inflammation process. It also causes cleavage of some cell proteins into small peptides which exported to the cell surface, where they attach to MHC class I molecules and trigger an autoimmune response.

Methods: In this study the frequencies of *ERAP1* allelic variants and genotypes for three non-synonymous SNPs have been determined in 160 AS patients and 160 healthy individuals, as control group, from an Iranian population in north-west Iran. Both AS patients and healthy control groups consist HLA-B27 positive and HLA-B27 negative individuals. The implemented method was SSP-PCR for genotyping three SNPs of *ERAP1* gene including rs30187, rs2287987, and rs10050860 in AS patients and healthy controls.

Results: Our investigation showed considerable differences in alleles frequencies within AS patients *vs*. healthy controls. The association of three SNPs; rs30187, rs2287987, and rs10050860 with the risk of AS [odds ratio (OR) 0.775, 95% CI 0.566–1.06, P=0.12 for rs30187, OR 0.561, 95% CI 0.359–0.877, P=0.01 for 10050860 and OR 1.91, 95% CI 1.16-3.15, P=0.014 for rs2287987] was the most important result of this study.

Conclusion: The *ERAP1* gene polymorphisms are associated with ankylosing spondylitis (AS) pathogenesis and could be considered as risk factors of this autoimmune disease.

Recent Publications

1. Yin Tang, Ping Yang, Fang Wang, Hui Xu and Shou-Yang Zong (2018) Association of polymorphisms in *ERAP1* and risk of ankylosing spondylitis in a Chinese population. Gene 6468-11.
2. Olivia M Popa, Marius Cherciu, Laura I Cherciu, Luis O Popa, et.al. (2016) *ERAP1* and ERAP2 gene variations influence the risk of psoriatic arthritis in Romanian population. Arch. Immunol. Ther. Exp. 64(1): S123-S129.
3. Chin-Man Wang, Huei-Huang Ho, Su-Wei Chang, Yeong-Jian Jan Wu, Jing-Chi Lin, et al. (2012) *ERAP1* genetic variations associated with HLA-B27 interaction and disease severity of syndesmophytes formation in Taiwanese ankylosing spondylitis. Arthritis Research & Therapy 14: R125.
4. V Zvyagin, V Yu Dorodnykh, I Z Mamedov, D B Staroverov, A G Bochkova, et al. (2010) Association of *ERAP1* allelic variants with risk of ankylosing spondylitis. Acta Naturae. 2(3): 72-77.

Biography

Zohreh Babaloo is an Associate Professor of Immunology and has completed her PhD and Lab MD Fellowship from the Immunology London School of Hygiene and Tropical Medicine. Her main researches interests are immune responses and immunogenetics of autoimmune diseases; multiple sclerosis, behcet, ankylosing spondylitis, and infectious diseases; visceral leishmaniasis. She is the Head of Immunology Department and Director of Immunology Drug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

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