UNCOVERING THE ROLE OF HLA-B ALLELES IN HLA-B*27-NEGATIVE SPONDYLOARTHRITIS IN ROMANIA

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Spondyloarthritis (SpA) encompasses a heterogeneous spectrum of chronic inflammatory disorders affecting the axial skeleton, peripheral joints, and entheses. The disease is strongly associated with the HLA-B*27 allele, which has been extensively studied as a major genetic risk factor. However, patients lacking this allele remain poorly studied, particularly in Eastern European populations, where underrepresentation in large-scale genetic studies has left alternative immunogenetic mechanisms largely unexplored. To address this gap, we investigated genetic risk factors in 263 HLA-B*27-negative SpA patients from Northeastern Romania and compared their allele frequencies with those of healthy controls. Our analysis identified several alleles, including HLA-B*47 and HLA-B*54, as being significantly more prevalent among patients, whereas others were underrepresented. Associations between certain alleles and specific clinical features were also observed, linking particular variants to manifestations such as skin involvement and systemic inflammation. Moreover, a cluster of alleles—HLA-B*08, B*18, and B*35—demonstrated overlapping peptide-binding repertoires, suggesting potential synergistic roles in disease susceptibility beyond the classical HLA-B*27 pathway. These findings provide new insights into the complex immunogenetic architecture of SpA in HLA-B*27-negative individuals. They support the existence of alternative pathogenic mechanisms and emphasize the importance of extending genetic research to populations that have historically been overlooked. A better understanding of these pathways has the potential to refine diagnostic approaches and inform the development of more personalized and effective therapeutic strategies. Acknowledgement: Romanian Ministry of Research, Innovation and Digitization, CNCS-UEFISCDI, project number PN-IV-P2-2.1-TE-2023-1182.

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