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Contribution of the inflammation-associated blood biochemical factors and body composition parameters to spinal pain manifestations in complex Arab pedigrees in Israel

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Musculoskeletal pain (MSP), specifically low back pain (LBP), is one of the major disabling health conditions in aging societies that constitutes major public health problems anticipated to grow significantly as the human population ages. However, many aspects concerning etiology and pathogenesis of LBP-related conditions remain unclear. This includes potential involvement of soluble biochemical factors and body composition characteristics that could be associated with the course of LBP, as well as a role of comorbidities, such as mental and metabolic disorders. The studies concerning the role of these factors as well as structural changes of the spine (spinal scoliosis) in LBP pathogenesis are controversial. There is also almost no data concerning the possible involvement of the familial/genetic factors in the correlations between the LBP-related conditions and aforementioned risk factors.

To study these associations, we recruited 1078 ethnically homogeneous family-based individuals belonging to 98 nuclear families. We have measured LBP manifestations, 14 biochemical plasma levels, several body composition parameters, structural changes of the spine (spinal scoliosis), and mental and metabolic comorbidities. By applying sophisticated statistical analyses, we report strong and independent correlations of LBP-associated disability and severity with: (i) plasma levels of some inflammation- and obesity-related factors, mainly growth and differential factor 15 (GDF-15) and vaspin; (ii) body composition parameters, mainly extracellular water (ECW) and skeletal muscle mass (SMM); (iii) mental diseases and metabolic comorbidities, which aggravated LBP manifestations; (iv) scoliosis scores. Pedigree-based genetic analysis revealed the involvement of putative genetic factors in the inter-individual variations of (i) LBP-related disability; (ii) ECW levels, plasma levels of vaspin and GDF-15; (iii) between these factors and body composition and chronic spinal pain-related phenotypes. We believe that these results provide new insights into the role of selected biochemical factors, body composition parameters along with mental and metabolic comorbidities in LBP pathogenesis, potentially serving as novel biomarkers for monitoring, prevention, and/or treatment of LBP.

Biography

Nader Tarabeih, PhD, is a prominent clinical researcher and academic from Israel specializing in biomedical sciences and translational research. With a doctorate in Molecular Biology from a leading Israeli university, Dr. Tarabeih's work focuses on the discovery and clinical application of biomarkers in oncology and metabolic diseases.

He is currently affiliated with a reputed medical research institution, where he leads multiple interdisciplinary projects that integrate genomics, proteomics, and systems biology to develop personalized diagnostic tools. Dr. Tarabeih has published extensively in peer-reviewed journals and is frequently invited to speak at international scientific conferences.

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