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Contribution of the blood biochemical factors, body composition and genetics to low back pain manifestation in complex Arab pedigrees

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Objective: Evidence has suggested that the development of low back pain (LBP) is often associated with obesity, muscle loss and sarcopenia. The mechanisms of these associations remain unclear. To clarify this, we measured circulating levels of a selected panel of soluble factors, presumably involved in the pathogenesis of obesity and sarcopenia, and correlated them with several LBP-related characteristics, considering body composition, familial effects and other relevant covariates.

Methods: The cross-sectional study comprised of 1078 Arab-Israeli individuals. Patients were recruited based on self-reported LBP. Body composition variables (including fat and muscle mass measurements) assessed by bioelectrical impedance analysis (BIA) and anthropometric measurements, scoliosis as measured by scoliometer, and plasma levels of several cytokines by ELISA method were collected. Statistical analyses accounted for familial composition of the sample and possible putative genetic effects.

Results: LBP affected individuals were significantly older, and showed increased obesity, decreased skeletal mass, and a significant correlation with spinal scoliosis when compared to healthy controls. Putative genetic factors were significantly associated with the age of onset of LBP, regardless of sciatic pain. Using univariate analyses, plasma concentrations of GDF-15, leptin, chemerin and follistatin were found to be significantly

elevated in the LBP-affected groups (with or without sciatic pain) and were highly significantly ($p < 0.001$) associated with other LBP-related phenotypes, specifically, disease duration, disability and physician consultation. However, following adjustment for age, sex, body composition, and putative genetic factors, only associations between GDF-15, LBP disability and medical consulting phenotypes, remained significant.

Conclusions: For the first time, we report a significant and independent association between plasma GDF-15 concentrations and LBP-associated disability. Longitudinal studies are recommended to determine whether GDF-15 could be a novel therapeutic target for prevention and/or treatment of LBP.

Speaker Biography

Nader Tarabeih is a PhD student in the Department of Anatomy and Anthropology in the Tel-Aviv University, under the supervision of professor Gregory Livshits. His PhD project on Complex Arab pedigrees was consisting of 1104 volunteer individuals belonging to 28 complex Arab pedigrees with high prevalence of Low Back Pain (LBP). The advantage of a huge sample allowed Nader to accurately estimate contribution of the putative genetic factors to the manifestation of LBP, represented in his first manuscript entitled "Genetic, Body Composition and Demographic Risk Factors of Low Back Pain in Complex Arab Pedigrees" submitted for publication in The Clinical Journal of pain. The second manuscript, in which detailed "Growth and differentiation factor 15 (GDF-15) is a biomarker for low back pain-associated disability", is in preparation. Nader recently participated in BIRAX Ageing Council 2018 which was in London.

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