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THE ASSOCIATION OF MODIC CHANGES AND DISABLING LOW BACK PAIN: A LARGE- SCALE, POPULATION- BASED STUDY

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INTRODUCTION: Modic changes (MC) are vertebral bone marrow changes adjacent to the endplates as noted on MRI. The association of specific MC type with low back pain (LBP) remains inconclusive, largely attributed to small sample sizes with limited phenotype assessment. Recently, the MC phenotype has been thoroughly defined. In relation to disabling LBP, various aspects of the topography and morphology of MC have not been properly assessed. As such, this study evaluated the relationship of disabling LBP with lumbar MC based on an extensive phenotype profile of these changes in a large, population-based study.

METHODS: This was a cross-sectional study of Southern Chinese based on the Hong Kong Disc Degeneration Cohort Study. Disabling LBP was defined as LBP lasting ≥30 days during the past year and a VAS severest pain intensity of at least 6/10. Significant disability was regarded as an Oswestry Disability Index (ODI) score ≥20. Axial T1- and sagittal T2-weighted lumbar MRIs were used to assess the MC phenotype, disc degeneration (DD) and bulge /extrusion (B/E), and Schmorl's nodes (SN). Subject demographics were also assessed.

RESULTS: There were 1,151 subjects (63% females; mean age: 57 years). The prevalence of MC was 24.7% (7.0% Type I; 17.7% Type II). Subjects with MC were older (p=0.003), had more disabling LBP (p=0.008), higher ODI (p=0.001) and DD sum score (<0.001). There were no significant differences of LBP or ODI between lumbar regions. In multivariable analyses, MC were associated with LBP among males (adjusted OR: 2.07; 95% CI: 1.01-4.25) but not females. The associations strengthened when excluding anterior and mid MC in the anteroposterior dimension, whereby the association of MC with ODI was significant (adjusted OR: 2.08; 95% CI: 1.00-4.30).

DISCUSSION: This is the largest study to assess specific MC phenotypes with pain/disability profiles. We noted that MC variants were associated with disabling LBP, primarily among males but not females.