Identifying Psychosocial, Autonomic, and Pain Sensitivity Risk Factors of Chronic Temporomandibular Disorder by Using Ridge Logistic Regression and Bootstrapping

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Abstract : The temporomandibular disorder (TMD) is a series of musculoskeletal disorders ranging from jaw pain to chronic debilitating pain, and the risk factors for the onset and maintenance of TMD are still unclear. Prior researches have shown that the potential risk factors for chronic TMD are related to psychosocial factors, autonomic functions, and pain sensitivity. Using data from the Orofacial Pain: Prospective Evaluation and Risk Assessment (OPPERA) study's baseline case-control study, we examine whether the risk factors identified by prior researches are still statistically significant after taking all of the risk measures into account in one single model, and we also compare the relative influences of the risk factors in three different perspectives (psychosocial factors, autonomic functions, and pain sensitivity) on the chronic TMD. The statistical analysis is conducted by using ridge logistic regression and bootstrapping, in which the performance of the algorithms has been assessed using extensive simulation studies. The results support most of the findings of prior researches that there are many psychosocial and pain sensitivity measures that have significant associations with chronic TMD. However, it is surprising that most of the risk factors of autonomic functions have not presented significant associations with chronic TMD, as described by a prior research.