Putative Epigenetic Markers of Cardiometabolic Risk Mediated by Disturbed Sleep and Chronic Orofacial Pain

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Introduction: Disturbed sleep and chronic orofacial pain (COP) are interrelated conditions that significantly increase the risk of cardiometabolic diseases, including hypertension, diabetes, and cardiovascular disease. Despite this established relationship, the biological mechanisms that connect sleep disturbances and COP to cardiometabolic dysfunction are not fully understood. Emerging evidence highlights epigenetic modifications, such as DNA methylation and histone acetylation, as key mediators in this process. These modifications, can alter gene expression without changing the DNA sequence, influencing pathways related to inflammation, oxidative stress, and metabolic regulation.

Aim: This presentation explores how disturbed sleep and COP may impact epigenetic regulation in specific genes involved in cardiometabolic risk.

Results and Discussion: We focus on the altered methylation of pro-inflammatory genes, such as IL-6 and TNF-α, which are known to play a role in systemic inflammation and insulin resistance, as well as epigenetic changes in genes like SOD2 that regulate oxidative stress. These modifications would contribute to the chronic activation of inflammatory pathways, mitochondrial dysfunction, and autonomic dysregulation, all of which are critical in the development of cardiometabolic diseases.
By identifying possible epigenetic markers associated with disturbed sleep and chronic orofacial pain, we aim to provide new insights into early detection of cardiometabolic risk in aTected individuals. Additionally, understanding these epigenetic changes oTers potential therapeutic targets for interventions aimed at reversing or mitigating cardiometabolic risk through sleep improvement and pain management strategies.

Conclusion: This work underscores the importance of integrating sleep and pain management into broader approaches to prevent and treat cardiometabolic diseases.

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