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Yawning and Cortisol as a Potential Biomarker for Early Detection of Multiple Sclerosis

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Abstract : Cortisol is essential to the regulation of the immune system and yawning is a pathological symptom of multiple sclerosis (MS). Electromyography activity (EMG) in the jaw muscles typically rises when the muscles are moved and with yawning is highly correlated with cortisol levels in healthy people. Saliva samples from 59 participants were collected at the start and after yawning, or at the end of the presentation of yawning-provoking stimuli, in the absence of a yawn, together with EMG data and questionnaire data: Hospital Anxiety and Depression Scale, Yawning Susceptibility Scale, General Health Questionnaire, demographic, health details. Exclusion criteria: chronic fatigue, diabetes, fibromyalgia, heart condition, high blood pressure, hormone replacement therapy, multiple sclerosis, stroke. Significant differences were found between the saliva cortisol samples for the yawners, $t(23) = -4.263$, $p = 0.000$, as compared with the non-yawners between rest and post-stimuli, which was non-significant. Significant evidence was found to support the Thompson Cortisol Hypothesis suggesting that rises in cortisol levels are associated with yawning. Further research is exploring the use of cortisol as an early diagnostic tool for MS. Ethics approval granted and professional code of conduct, confidentiality, and safety issues are approved therein.

Keywords : cortisol, multiple sclerosis, yawning, thompson cortisol hypothesis
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