Breaking Diagnostic Barriers: Migraines Diagnosis and Handwriting Analysis

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Handwriting is defined as a complex neurophysiological process that involves multiple aspects including visual-motor, memory, and linguistic aspects as well as multiple subsections of the central nervous system. Literature shows migraines cause lasting structural and functional changes which have the potential to alter handwriting. Three groups were randomly selected: migraine without aura (n=9), migraine with aura (n=12) and control (n=20). A questionnaire was utilized to assess migraine frequency and presence of aura. Two handwriting assessments were used to gauge handwriting: the handwriting legibility scale and an objective test to analyze specific parameters. Grip force was also measured due to its correlation with improved legibility. Results show significant correlations between migraine frequency and NIWD (s Inter-word distance) NILD (s Inter-letter distance), variability of grip force (r=0.76, r=0.73, r=0.75 respectively), and statistically significant differences between Aura, No Aura and Control for the same parameters (p=0.02021, p=0.00171, and p=4.1E-16 respectively). Independent t tests showed significant differences between migraine w/aura and control migraine w/out aura and control and migraines w/aura and migraine w/out aura for NIWD and NILD (NIWD: p=0.01117, p=0.01063 p=3.2E-05. NILD: p=0.0134, p=0.0112, p=9.109E-05). Handwriting analysis is currently used to identify neurodegenerative disorders such as Parkinson's. The increased variability in spacing and grip force with migraines could be an indicator of the disease. Handwriting analysis has potential as a diagnostic tool.

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