Corneal Confocal Microscopy As a Surrogate Marker of Neuronal Pathology In Schizophrenia

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Abstract : Introduction:- We aimed to test the hypothesis that, using corneal confocal microscopy (a non-invasive method for assessing corneal nerve fibre integrity), patients with schizophrenia would show neuronal abnormalities compared with healthy participants. Schizophrenia is a neurodevelopmental and progressive neurodegenerative disease, for which there are no validated biomarkers. Corneal confocal microscopy (CCM) is a non-invasive ophthalmic imaging biomarker that can be used to detect neuronal abnormalities in neuropsychiatric syndromes. Methods:- Patients with schizophrenia (DSM-V criteria) without other causes of peripheral neuropathy and healthy controls underwent CCM, vibration perception threshold (VPT) and sudomotor function testing. The diagnostic accuracy of CCM in distinguishing patients from controls was assessed using the area under the curve (AUC) of the Receiver Operating Characterstics (ROC) curve. Findings:- Participants with schizophrenia (n=17) and controls (n=38) with comparable age (35.7±8.5 vs 35.6±12.2, P=0.96) were recruited. Patients with schizophrenia had significantly higher body weight (93.9±25.5 vs 77.1±10.1, P=0.02), lower Low Density Lipoproteins (2.6±1.0 vs 3.4±0.7, P=0.02), but comparable systolic and diastolic blood pressure, HbA1c, total cholesterol, triglycerides and High Density Lipoproteins were comparable with control participants. Patients with schizophrenia had significantly lower corneal nerve fiber density (CNFD, fibers/mm2) (23.5±7.8 vs 35.6±6.5, p<0.0001), branch density (CNBD, branches/mm2) (34.4±26.9 vs 98.1±30.6, p<0.0001), and fiber length (CNFL, mm/mm2) (14.3±4.7 vs 24.2±3.9, p<0.0001) but no difference in VPT (6.1±3.1 vs 4.5±2.8, p=0.12) and electrochemical skin conductance (61.0±24.0 vs 68.9±12.3, p=0.23) compared with controls. The diagnostic accuracy of CNFD, CNBD and CNFL to distinguish patients with schizophrenia from healthy controls were, according to the AUC, (95% CI): 87.0% (76.8-98.2), 93.2% (84.2-102.3), 93.2% (84.4-102.1), respectively. Conclusion:- In conclusion, CCM can be used to help identify neuronal changes and has a high diagnostic accuracy to distinguish subjects with schizophrenia from healthy controls.

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