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Cognitive function in adults with and without cystic fibrosis related diabetes (CFRD) attending a large UK cystic fibrosis unit

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Introduction and Objectives: On reaching adulthood many cystic fibrosis (CF) sufferers develop cystic fibrosis related diabetes (CFRD). CFRD shares clinical characteristics with type 1 (T1DM) and type 2 diabetes mellitus (T2DM). Impaired glucose tolerance (IGT), T1DM and T2DM have deleterious effects on cognitive performance. Hence, patients with CFRD are hypothesized to show similar impairment. This study aimed to elucidate the nature and severity of any cognitive impairment in patients with CFRD compared to non-diabetic patients with CF and healthy controls matched as closely as possible for age, gender and education level. Patients with CF were also matched as closely as possible on CFTR genotype.

Methods: Adult (>16 years old), pancreatic insufficient patients registered to a large UK CF unit who had adequate verbal and written English were eligible. 49 patients with insulin-treated CFRD and 49 CF non-diabetics who had received a normal oral glucose tolerance test (OGTT) within the past 12 months were recruited. 46 healthy matched controls were recruited from relatives of patients and the general population. Cognitive performance was assessed using the Cambridge Neuropsychological Test Automated Battery (CANTAB). Subjective measures of sleep, stress, mood and cognitive functioning were also collected.

Results: Matched controls performed better than both groups of patients with CF on tests of visual memory and learning, verbal memory, visual sustained attention, processing speed and executive function. Patients with CFRD performed significantly worse than controls on tests of mental flexibility and processing speed, which is consistent with the pattern of impairment shown in T1DM, and on verbal memory and learning, which is consistent with the pattern of impairment shown in T2DM. Compared to non-diabetic patients with CF, those with CFRD performed worse on tests of visual sustained attention, verbal memory, working memory, and processing speed.

Conclusion: CFRD has a negative impact on cognitive performance akin to T1DM & T2DM. Non-diabetic patients with CF also show impaired cognition but to a lesser degree than CFRD. Even modest cognitive impairment in adults with CF may impact upon their self-management skills, health and quality of life.