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**OLFACTORY IMPAIRMENT
IN EARLY DEMENTIA**

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Abstract

THE UTILITY OF OLFACTORY TESTING IN EARLY DEMENTIA

Introduction

The clinical significance of olfactory dysfunction in relation to early dementia has not been adequately studied before despite various studies demonstrating olfactory dysfunction in relation to neurodegenerative disorders especially dementia and more recently, mild cognitive impairment(MCI).

Objectives

The objective of this study was to identify olfactory deficits in MCI, Alzheimer's disease (AD) and Dementia with Lewy bodies (DLB) and any differential effects. The specific focus being on establishing the utility of olfactory testing in differentiating MCI from normals, MCI from early AD and especially early DLB from early AD.

Methods

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We recruited patients with early AD(27), early DLB(21), MCI(21) and elderly normals(47) for our study. They were assessed using a 16 item olfactory identification test, an olfactory threshold test using sticks impregnated with differing concentrations of butanol, and an olfactory hedonic tone test with differing concentrations of isoamyl acetate/valeric acid. They also underwent a cognitive battery including the MMSE, HVLT, CLOX testing and a CAMDEX Learning work up when necessary. Medial temporal lobe volume estimation using temporal lobe oriented CT scans and Apolipoprotein E(APOE) status was determined.

Results

Patients with MCI, AD and DLB had clinically significant olfactory deficits when compared with normal controls. Patients with mild DLB had the worst olfactory identification ability compared to those with mild AD or MCI, independent of age, cognitive function and sex. Olfactory tests showed useful discriminatory ability between AD and DLB. The decline in left medial temporal lobe width correlated with impaired olfactory function in those with MCI and AD. Smell identification score was a better predictor of AD and MCI from normals, than MTL width. APOE status in conjunction with olfactory dysfunction improved the sensitivity and specificity of a diagnosis of AD from normals.

Conclusion

Simple bedside tests of olfactory identification demonstrate significant impairment in MCI, early AD and early DLB. These findings have diagnostic significance particularly in early detection. Smell tests are easier to apply across populations with different educational, language and cultural backgrounds, in comparison to cognitive tests which need extensive validation in different settings.

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