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Electronic Presentations

Convention ID: 97
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Assessment of Reticular Activating System (RAS) Functioning in Demented Patients with Behavioral and Psychological Symptoms (BPSD)

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Keywords:
Dementia
Reticular Activating System
Behavioral
Psychological

Introduction

Behavioral and psychological symptoms of dementia (BPSD) are an integral part of dementia syndrome. They increase caring burden and impact cost of care. BPSD are not uncommon in demented patients whom featured with depressed and withdrawn, having irrational beliefs and become more easily irritable. Reticular Activating System (RAS) is regarded as “attention center” in the brain that serves as a point of convergence for signals from the external environment. RAS plays a significant function in determining whether a person can motivate, learn and remember things well or not, whether he or she is impulsive or with self-controlled as our concerned clinical symptoms of demented patients with BPSD.

Objectives

This study aimed to explore the relationship between the RAS functioning and demented patients with BPSD. The Kendrick Object Learning Test (KOLT) is a test of recall of everyday objects after viewing for a brief period, an immediate recall of briefly perceived visual data. The Kendrick Digit Copying Test (KDCT) is a test of speed in processing and recording information. These tests suggested cortical excitation mediated by both the RAS and the hypothalamic limbic network which deteriorate in demented patients with BPSD. However, in depression, only the hypothalamic limbic system but no RAS is involved.

Methodology

Twenty five demented patients with BPSD and 25 depressive patients were recruited in this study. They are matched in age (mean age 78, sd 5.2) and shared similar demographic background. The participants are tested with the Kendrick Object Learning Test (KOLT) and the Kendrick Digit Copying Test (KDCT). To observe the

short term longitudinal change of their RAS functioning, these tests were administered again 4 weeks following the initial assessment.

Result

In initial assessment, there is a tendency that the KDCT and KOLT scores were more impaired in group of demented patients with BPSD than the group of depressive patients ($p < 0.01$). With in-patient treatment for 4 weeks, the depressive group showed improvement in KOLT ($p < 0.1$), but not on KDCT ($p = .82$). However, in the dementia group, there were no significant difference noted in both KOLT and KDCT ($p < 0.5$). Some reports had confirmed the above trend between demented patients with BPSD and depression. RAS did not function properly as in the demented patients with BPSD. They would have limited motivation, difficulty learning and with limited memory improvement. As the reticular system is not involved in group of depressive patients, there would be improvement in object learning, but no significant difference on speed in processing and recording information as measured by speed-performance tests (KDCT). Therefore, proper rehabilitation trainings and care giving techniques could be arranged in meeting the specific patients' needs.