A COMPARISON OF COGNITIVE FUNCTIONS IN STABLE PATIENTS WITH COPD AND AGE-MATCHED HEALTHY VOLUNTEERS USING MINI-MENTAL STATE EXAMINATION QUESTIONNAIRE.

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Abstract:
Chronic Obstructive Pulmonary Disease (COPD) is an airway disease characterized by airflow limitation and is not fully reversible. COPD is a multisystem disorder and is a major public health problem. Cognitive dysfunction is common and clinically important in COPD patients. We investigated the diagnostic accuracy of Mini Mental State Examination (MMSE) in screening cognitive function in 50 clinically stable patients with COPD with mean age of 50.12 years and 50 healthy controls with mean age of 51.72 years. This case control study was carried out in the Department of Physiology, Kilpauk Medical College, from September 2012 to August 2013. Data were analyzed by independent samples t-test. Stable COPD patients scored a mean of 22.34 (borderline impaired cognitive functions) and control group scored a mean of 25.84. The mean MMSE score was significantly lower in stable COPD patients. A score of 23 and above out of 50 is considered as normal cognitive function. In conclusion, MMSE can be used as a screening tool to detect cognitive dysfunction in stable COPD patients.

Keyword: Chronic Obstructive Pulmonary Disease, Cognitive function, Mini-Mental State Examination

INTRODUCTION:
COPD is an airway disease characterized by airflow limitation and is not fully reversible, and it leads to chronic hypoxia. The airflow limitation is progressive and associated with an abnormal inflammatory response of the lung tissues to noxious particles and gases. It is the sixth leading cause of death in worldwide. It is associated with peripheral neuropathy, motor neuron involvement, encephalopathy and derangement of cognitive functions. Risk factors are cigarette smoking, smoke from combustion of solid fuels like wood, dried cow dung, smoke from automobile and industries, host factors like alpha 1 antitrypsin deficiency, airway hyper-responsiveness and reduced maximal attained lung functions.
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**OBJECTIVE:**
To assess cognitive functions in stable patients with COPD compared to age-matched healthy volunteers using Mini-mental state examination questionnaire.

**MATERIALS AND METHODS:**

**Study Design:** Case control study

**Subject selection:** Total sample size – 100 subjects, 50 Stable COPD patients and 50 healthy Controls.

**Period of study:** September 2012 – August 2013

**Place of study:** Department of Physiology, Kilpauk Medical College, Chennai.

**Inclusion criteria:** Stable COPD patients diagnosed by our medicine OPD, KMCH, male and female > 40 years, duration of illness > 5 years, minimum educational qualification of Std VIII and above.

**Exclusion criteria:** Pulmonary tuberculosis, Diabetes mellitus, hypertension, alcoholism, neurological disorders, kyphoscoliosis, anemia, vitamin deficiencies, drugs causing neuropathies, thyroid disorders and acute severe COPD.

**Controls:** 50 healthy volunteers were taken as control.
Screening Procedures: Patients who were qualified under the inclusion criteria were enrolled in the study. Heart rate, blood pressure, height and weight were measured. Brief history was taken to rule out HT/DM/Pulmonary tuberculosis/ alcoholism/drug intake. General clinical examination was done. Consent: A written consent were taken from the patients and controls after explaining the procedure and its significance in their vernacular language. Ethical clearance was obtained. Method: Cognitive functions were assessed with Folstein Mini Mental State Questionnaire. Folstein Mini Mental State Questionnaire tests under four headings – I. ORIENTATION – carries maximum score of 10. II. IMMEDIATE RECALL - carries maximum score of 3. III. ATTENTION AND CALCULATION - carries maximum score of 5. IV. RECALL - carries maximum score of 3. V. LANGUAGE - carries maximum score of 9. MAXIMUM SCORE is 30. Score of 23 – 30 is considered normal; 19 – 23 is considered borderline impairment; < 19 is considered impaired. Results and Statistical analysis: Results were derived by statistical analysis of the data obtained and expressed in tables and charts. The data were analyzed using SPSS 7.5 for win-

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<th>TABLE – I</th>
<th>Comparison of education between cases and controls</th>
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P = 0.480
In our study, cases and controls were selected with minimum qualification of standard VIII and above (P value 0.480). There was no significant difference in education qualification between cases and controls.

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<tr>
<td>Comparison of Folstein MMSE scores between cases and controls</td>
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<tr>
<td>Variable</td>
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<td>Folstein MMSE score</td>
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We observed there was borderline impairment of cognitive function in stable COPD patients as per MMSE scores (P < 0.001).
DISCUSSION:
In our study, we enrolled 50 stable COPD patients and 50 healthy controls after general clinical examination. The mean age of the control group was 51.72 ± 5.131 ranging from 40 – 60 years. The mean age of the COPD patients was 50.12 ± 5.752 ranging from 40 – 60 years. P value is 0.145 (not statistically significant). The mean height of the control group was 1.7008 ± 0.06044. The mean height of the COPD patients was 1.6986 ± 0.06105. P value is 0.857 (not statistically significant). The mean weight of the control group was 69.20 ± 4.806. The mean weight of the COPD patients was 69.82 ± 5.185. P value is 0.537 (not statistically significant). The mean BMI of the control group was 23.8828 ± 1.50071. The mean BMI of the COPD patients was 24.2106 ± 1.45328. P value is 0.270 (not statistically significant). The mean MMSE score of the control group was 25.84 ± 1.822. The mean MMSE score of the COPD patients was 22.34 ± 2.869 (borderline impaired cognitive function). P value is < 0.001 (statistically significant).

We observed there was borderline impairment of cognitive function in stable COPD patients as per MMSE scores (P < 0.001). Antonelli-Incalzi R et al reported that MMSE can be used to exclude cognitive dysfunction in COPD patients. In their study, 149 COPD patients were screened for cognitive dysfunction using MMSE. Incalzi RA et al reported cognitive decline in COPD patients, and cognitive decline was faster in the presence of severe bronchial obstruction. Isoaho R et al studied the relative contribution of COPD to the occurrence of cognitive impairment and dementia in the elderly. Gupta PP et al reported cognitive dysfunction in stable COPD patients. MMSE scores were significantly reduced in COPD group (P value < 0.001). 27/40 COPD patients had reduced MMSE scores. All these studies are in accordance with my observations which also showed cognitive dysfunction in COPD patients.

CONCLUSION:
Thus from the above study, it is evident that there was borderline cognitive impairment in stable COPD patients compared to age, height, weight, BMI and education matched healthy controls. This study highlights the importance of using MMSE for assessing cognitive functions, which is inexpensive, non-invasive, and also easy to execute clinically.

BIBLIOGRAPHY:
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