



## STANDARDIZED MINI-MENTAL STATE EXAMINATION OF ANAEMIC PATIENTS AND ITS COMPARISON WITH CONTROL

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### Abstract:

*Present study was done in 30 anaemia patients against 30 controls . The tools used was SMMSE. Data were presented as mean and analyzed using students t test, Anemic had very highly significant cognitive dysfunction in the orientation, attention, language and construction domains of SMMSE and also on the total scores. Anaemic patients had significant circumscribed areas of cognitive dysfunctions compared to the control group but a clear relation between the severity of anaemia and the severity of cognitive dysfunction could not be established*

### KEY WORD:

Sanaemia ,cognitive dysfunctions ,hemoglobin, SMMSE,

### A STUDY OF COGNITIVE DYSFUNCTIONS IN ANEMIA

#### INTRODUCTION:-

Anaemia is related to cognitive performance, especially attention, in preschool and school children. Pollet et al (1989) found significant differences in IQ between children iron deficiency anemia and iron replete children. They also found that vocabulary scores differed significantly among iron deficit anaemics and iron deficit replete groups. In a study of iron deficient adolescent girls, Burner et al (1996) found improvement in vocabulary performance after eight weeks of iron supplementation although there was no change in attention measures. All the chronic medical conditions with restored hemoglobin levels did not have much neurocognitive deficits. Soemantri et al (1989) suggested that supplementation with 10mg ferrous sulfate per kilogram body weight per day for 3 months in anaemic subjects resulted in apparent improvement in hematological status and learning achievement scores. Soewond S. et al (1989) from pre and post psychological test data showed that iron deficient anemia produces alterations in cognitive process related to visual attention and concept acquisition and these alterations are reversed with iron treatment. Pollett E. et al (1989) found that there is evidence of a positive association between iron status and IQ, language and school achievement test but there is no support for the internal validity of the hypothesis that this association is casual. A Driva et al (1985) states that 6-7 year old children who had suffered from iron deficiency during the 6th-18th months of life, showed less ability to concentrate, were more clumsy and more hyperactive when compared to group of children who did not have iron deficiency during the first 2 years of life. In the recent years attention has been focussed on the behavior disturbances which accompany iron deficiency. Therefore present study was done to know the impact of anemia on various cognitive functions. The objectives of study were to determine the cognitive dysfunctions in

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anemia patients. and its comparison with that of controls .

#### MATERIAL AND METHODS:-

This was a single point non-invasive study of cases of anemia involving administration of a battery of neuropsychological tests to assess the cognitive function in the patient group and control group which has been group matched for age, gender and education. All subjects gave informed consent for the study. Purposive random sampling technique was applied. The sample consisted of first 30 patients diagnosed as anemia selected from the various in patient wards.

#### Inclusion Criteria (Anaemic Patients)

1. Informed consent
2. Age group 18-55 years
3. Diagnosis of Anemia confirmed by haematological tests

#### Exclusion Criteria: (Anaemic Patients)

1. History suggestive of other significant physical (such as HIV, Hepatitis etc.) or neuropsychiatric disorder which can cause cognitive impairment such as; seizures, cerebrovascular disorders, dementia, neurodegenerative disorders, systemic illness with known cerebral consequences, depression, anxiety, psychotic illnesses either presently or in the past.
2. Evidence of psychoactive substance dependence or significant abuse.
3. Those patients receiving the medication associated with cognitive side effects like tricyclic antidepressants, antipsychotics and lithium.
4. Family history of psychiatric illness in first degree relative.

The control group subjects consisted of subjects not having anemia (Hb > 11.0g/dl). A written informed consent had been taken for participation after explaining the purpose and design of study to each subject. The psychiatric status was assessed by using a structured clinical interview to know the psychiatric status. Standardised mini-mental status examination (SMMSE) was used for the analysis of mental status. Data were presented as mean  $\pm$  SEM and Students 't' test used to find the significant differences between the two groups

#### RESULTS AND DISCUSSION

Table 1. Shows results obtained from standardized mini mental state examination.

**Table.1 Standardized Mini-Mental state examination of Anaemic and control group patients**

	GROUP	N	Mean	Std. Deviation	t
Orientation	Anaemia	30	7.83	1.01	8.67
	Control	30	9.66	.54	p=.001 vhs
Registration	Anaemia	30	2.76	.43	1.82
	Control	30	2.93	.25	p=.073 ns
Attention	Anaemia	30	2.40	.81	7.41
	Control	30	4.03	.88	p=.001 vhs
Recall	Anaemia	30	1.83	.64	2.67
	Control	30	2.23	.50	p=.01 hs
Language	Anaemia	30	6.93	.68	4.09
	Control	30	7.56	.50	p=.001 vhs
Construction	Anaemia	30	.60	.50	3.78
	Control	30	.96	.18	p=.001 vhs
Total Score	Anaemia	30	22.36	1.65	12.19
	Control	30	27.40	1.54	p=.001 vhs

The study revealed that there is a significant cognitive impairment in anaemia patients compared with controls which persisted even after correction for confounding factors. The mean age in the present study was 28.3 years for control group and 28.5 year for the cases. It is well established that impairments in cognitive functions are often seen with anaemia but a number of confounding factors are also known to play an important role. The confounding factors which occur in association with anaemia could be malnutrition, poverty, low maternal IQ, poor maternal education, low birth weight. The use of SMMSE has yielded conflicting results. Most of the studies done in this context have been done in children and SMMSE or MMSE has not been used in these studies. Even in recent studies on pregnant females and on iron deficiency anaemia adolescents, more comprehensive neuropsychological testing has been done and has revealed considerable cognitive deficits. SMMSE is not the a test of choice when one is interested in finding mild cognitive impairment as it might miss these subjects, which could have been the case in this study as well. Another fallacy in the SMMSE is that it is biased towards verbal items and does not adequately measure other cognitive functions such as ability to attend to relevant input, ability to solve abstract problems, psychomotor speed, information processing speed, which are more affected in anaemia patients. This means that SMMSE should be used in conjunction with other more comprehensive neuropsychological assessments of cognitive functions. Current study was a cross-sectional one. Since cognition is a measure of change in an individual over time, longitudinal studies are more reliable.

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