

Observed Specific Pattern of cognitive impairment in patients with Mild Traumatic Brain Injury: a prospective study of 35 patients

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P7.185 - AAN, Washington DC April 2015

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INTRODUCTION

Patients of mild traumatic brain injury (mTBI) are usually discharged from the ER without the advice to follow-up with a specialist in absence of overt physical symptoms. MTBI can cause a wide range of longer term functional and cognitive deficits that can significantly affect the quality of life.

According to recently published data by the CDC, approximately 40% of mTBI patients have at least one unmet need / with problem even after one year of injury. The top three unmet needs were:

improving memory and problem solving, managing stress and emotional upsets, and improving vocational skills at pre injury level

All the above needs are related to the neurocognitive impairment.

We, as a specialized out-patients center for mild and stable ABI/TBI patients, had an opportunity to study Wechsler Memory Scale IV, standardized Psychometric test battery in mTBI patients or concussion head injury, neurocognitive types of deficit in mTBI with 7 cognitive modules. We tried to determine the specific pattern of cognitive impairments in patients with mild traumatic brain injury.

MATERIAL AND METHODS

In past 12 months, 35 patients (F: M = 17:18) have presented at our center for the treatment of persistent symptoms following mTBI. Mean age was 41 years (range 19-72 years) and the mean period elapsed after mTBI was 19 months. Majority presented with persistent headaches, vertigo and seizures but only 4 (11.4%) subjectively complained of memory loss. Patients were screened for cognitive impairment with Montreal Cognitive Assessment (MoCA) followed by Wechsler Memory Scale assessment (WMS-IV). WMS-IV assesses the auditory, visual, immediate and delayed recall memories in detail. Patients are allotted index score in each modality. A score of 100 is considered average. Average period of the test from the TBI in mTBI group was 20 months.

Method Cont..

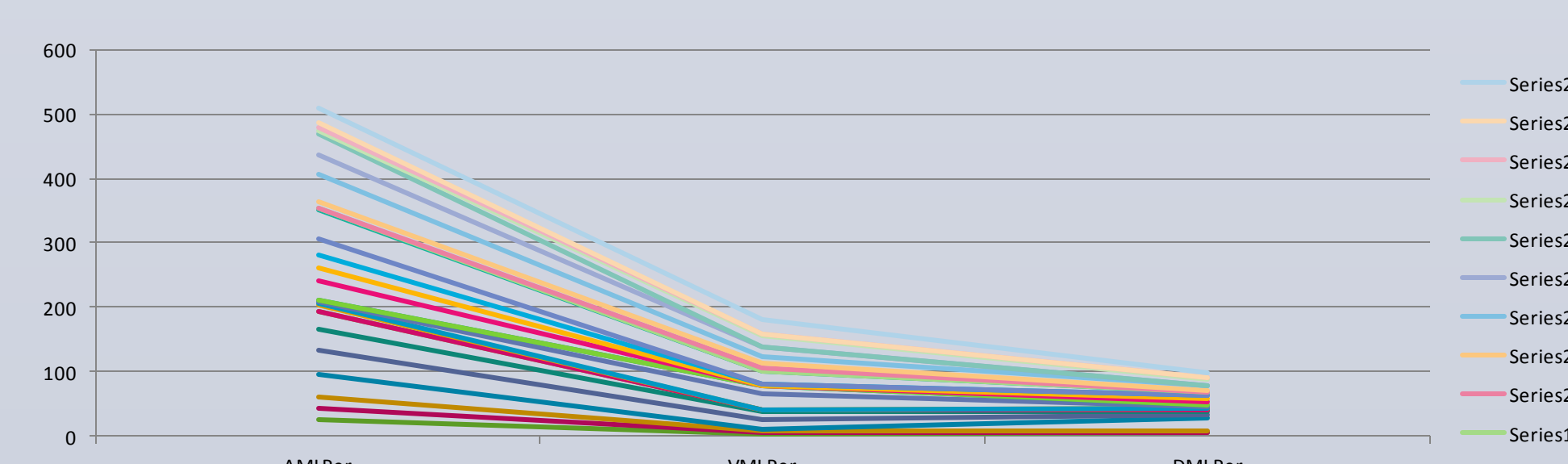
Symptoms at Present	Number
Age	19-72 yrs
F: M	17:18
Headaches	30
Vertigo (BPPV)	12
cognitive complaints	4
Seizure symptoms	3

Exclusion criteria: patients who had presented to us for the first time after >36 months post injury, and any pre-morbid conditions in CVA, insomnia, depression, any previous TBI, and patients on narcotics, sedative or cognition altering drugs were eliminated.

As a part of standard protocol, we administered MoCA to all patients at the intake visit. This test makes assessment of 7 cognitive functions, namely: visuo-spatial; naming; memory; attention; language; abstraction and orientation and allocates individual scores.

From our previous studies, we have learned cognitive impairment in visuo-spatial, memory, attention, language triggered the need for the psychometric test, the WMS IV. Two patients were rescheduled for the test due to over night sleep deprivation. The same patients population was also tested by 2nd standard psychometric test Neuro-Cognitive Assessment battery(NAB) screening module also showed similar results in mild moderate and sever impairment in auditory memory, visual memory and delayed memory recall.

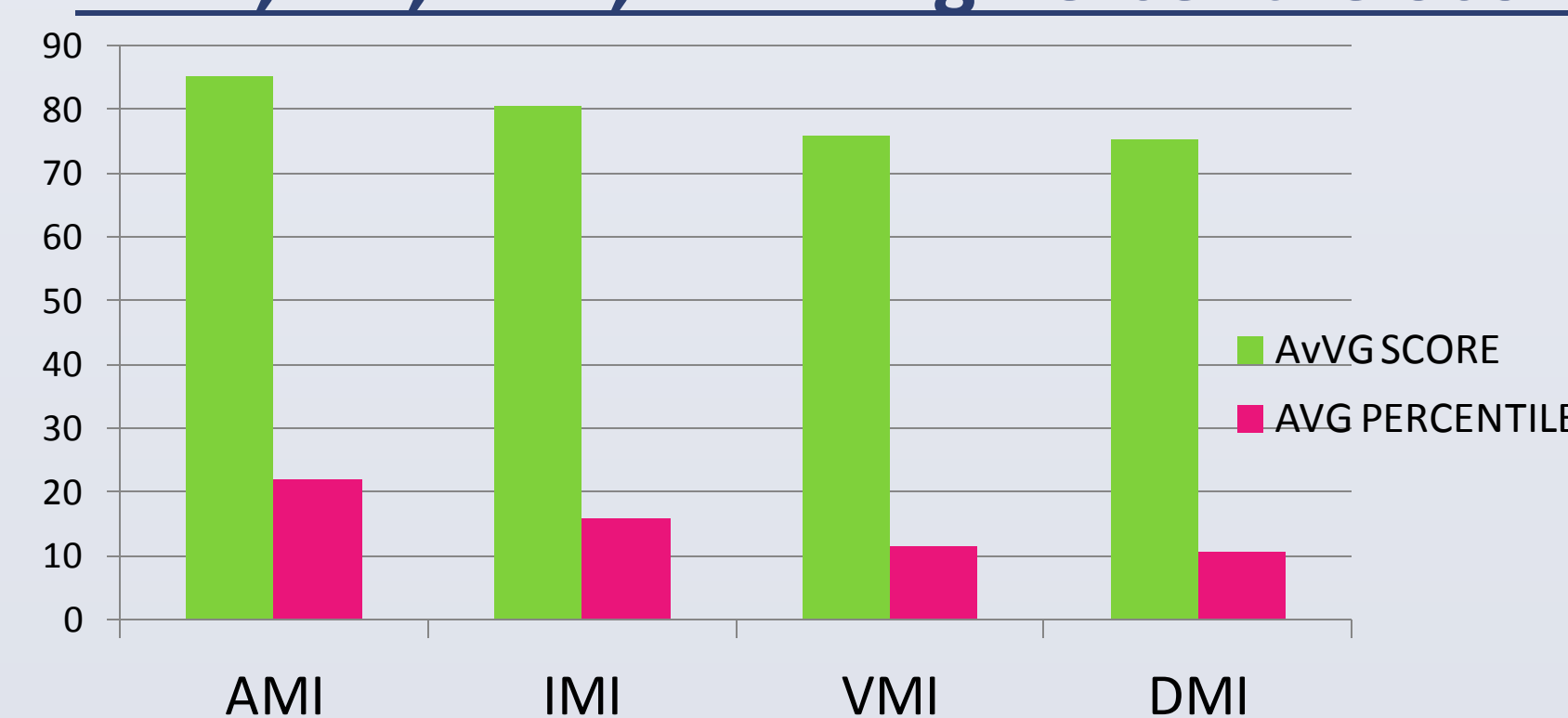
Sample of Percentile score with A-V-D-ip Pattern



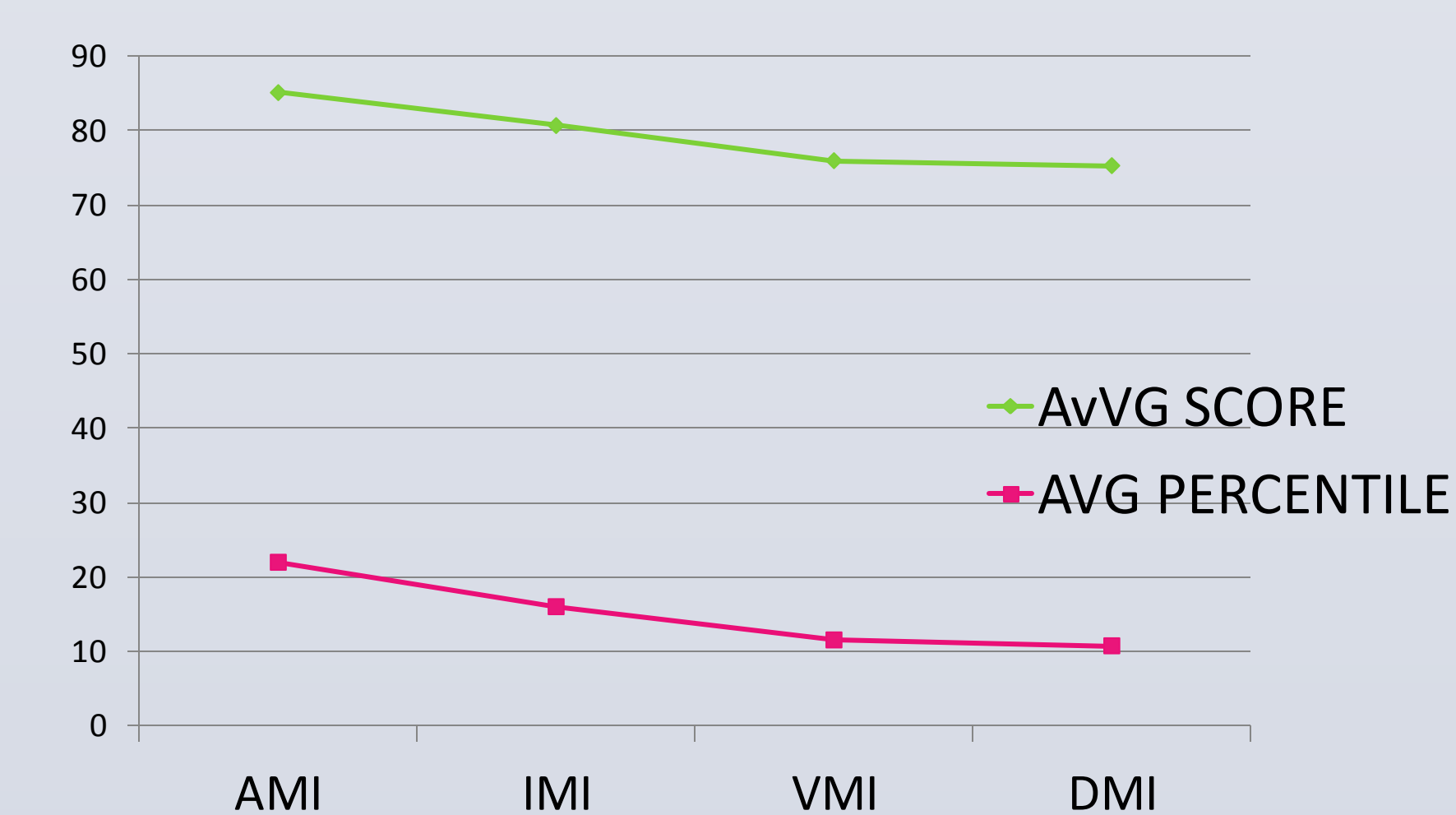
RESULTS:

19 patients (54%) had abnormal MoCA scores (<27). The mean score for auditory, visual, visual working, immediate recall and delayed recall memories were 85, 75, 76, 81 and 75 respectively that are in the bottom 25th percentile for all modalities. Visual memory and the delayed recall memory (11th percentiles) are the most affected cognitive functions followed by the working visual memory (13th percentile). Auditory memory (22 percentile) was the least affected cognitive modality. Paired T test for average score and percentile score AMI vs VMI P value 0.042.

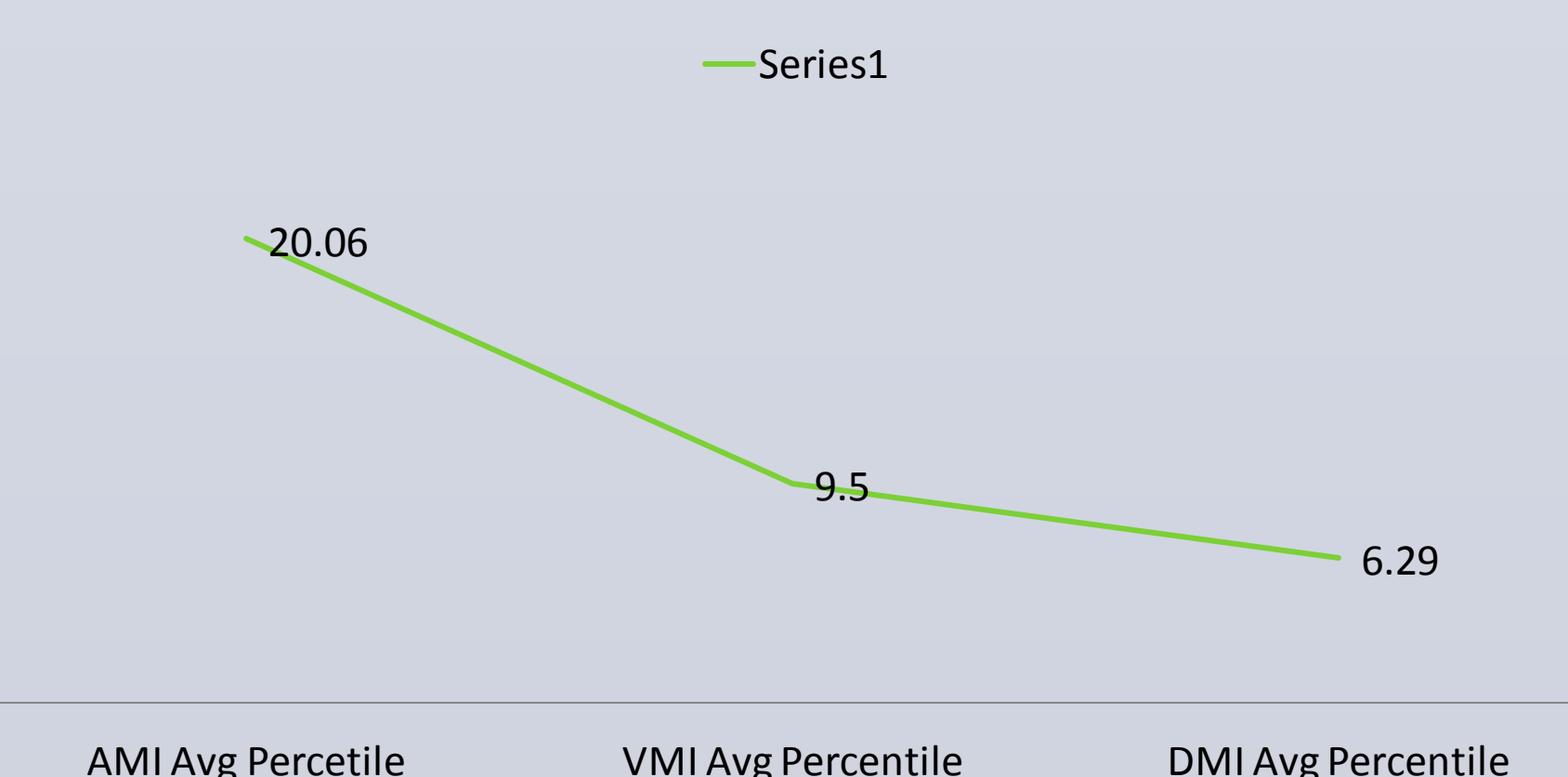
AMI ,IMI, VMI, DMI Avg Percentile Score



A-V-Dip in Avg Percentile score



Avg Percentile score showing A-V-DIP In 35 Patients with mTBI



RESULTS Cont..

Cognitive impairment persists in majority (75%) of patients even a year after mTBI from the point prevalence in our previous study.

CONCLUSIONS

Assessment of cognitive impairment should be a mandatory protocol while evaluating patients of mTBI. A majority of MTBI patients continue to suffer from occult cognitive impairment long after the initial injury. Impairment of Visual memory and delayed recall (V-D-IP) is the significant pattern seen in all patients with mTBI with consistent results in all 35 patients in study group. mTBI with persistent symptoms after 4 weeks should have assessment of cognitive functioning as a standard protocol with specific emphasis on A-V-DIP.

Author Recommendations:

- Mandatory 2 week and 3 month follow up after mTBI with trained physician in TBI.
- Routine screening of mTBI patients with MoCA.
- Positive MoCA with persistent symptoms of cognitive impairment should be further tested with standardized WMS-IV and confirmed with A-V-DIP sign.
- mTBI pateints should be given an opportunity to Neuro-Cognitive Rehab as active intervention rather than nature takes its own course or labeled as percentage disability in our veterans. Please follow our poster # **P6.189.**

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