Memory Profiles Among Patients With Relapsing Remitting Multiple Sclerosis

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BACKGROUND

- Memory difficulties are common among patients with Multiple Sclerosis (MS).
- However, there is considerable controversy whether these problems are primarily related to difficulties with acquisition, retrieval or storage.
- Despite the heterogeneity of disease expression in MS, little consideration has been given to the possibility that there may be multiple phenotypes of memory deficit in MS.

OBJECTIVE

- To determine whether patients with MS have memory performances that tend to cluster into a single specific pattern of strengths and weakness, or whether they show multiple patterns of distinct verbal memory performance.

RESULTS

- Five distinct clusters emerged with 61 to 98 patients in each, reflecting considerable variability in memory performance.
- The clusters did not differ significantly in terms of age, education, sex, or duration of symptoms.

Figure 1:
- Cluster-1 (n=75): Poor cued-recall but good recognition memory
- Cluster-2 (n=98): Circumscribed difficulty with prose recall

Figure 2:
- Cluster-3 (n=75): Specific difficulties with learning and recall on Word Lists
- Cluster-4 (n=69): Difficulties with only the acquisition trials on Word Lists
- Cluster-5 (n=61): Relative strength on Word Lists but mild difficulties with prose recall and recognition memory

METHODS

Participants: 378 patients with clinically definite relapsing-remitting MS who had completed a standard clinical neuropsychological evaluation.
- Mean Age: 43.8 ± 9.3 (SD)
- Education: 13.9 ± 2.4
- Sex (%Female) 74.6%
- Duration of symptoms (years) 8.9 ± 7.5

Procedure: All patients completed the Wechsler Memory Scale-III, and the following nine age-corrected scores were examined:
- Logical Memory (LM) Immediate and Delayed
- Verbal Paired Associates (VPA) Immediate and Delayed
- Word Lists (WL) Immediate, Total, Delayed, Recognition
- Auditory Recognition Delayed Index

Statistical Procedures: Identification of cluster patterns was based on a two-step procedure described by Lange et al. (2002) that maximizes the influence of profile shape while minimizing the influence of profile magnitude on the cluster solutions. First, scaled scores were converted to a common standard score metric with a mean of 100 and SD of 15. Scores for each subject were then transformed to ipsative deviation scores by subtracting his/her mean score across the nine measures from each individual measure. These ipsative deviation scores were then subjected to a two-step cluster analysis procedure (i.e., hierarchical and k-means analyses). The hierarchical analysis was used to first identify the maximum number of meaningful clusters and preliminary group membership in these clusters. The k-means analysis was then employed to examine the internal validity of the clusters and cluster membership identity.

CONCLUSIONS

- These results suggest that relapsing-remitting MS patients manifest multiple phenotypes of memory dysfunction, which are likely to vary depending on the distribution of MS plaques