Naming Ability in Korean Elderly with Mild Cognitive Impairment and Mild Dementia

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Abstract. The present study explores the relationship between the short version of Korean Boston Naming Test (S-K-BNT), Controlled Oral Word Association Test - phonemic (COWAT-/k/) & semantic (COWAT-Animal), and Mild Cognitive Impairment (MCI) & Mild Dementia. Total of 594 community-dwelling seniors over 60 years of age consisting of normal elderly, (n=333) those with MCI (n=241), and those with mild dementia (n=20). In the results of the multinomial logistic regression analysis, all three naming tests showed a significant negative relationship with MCI and mild dementia in the case of the normal elderly. However, When all confounding factors were adjusted, phonemic fluency was not significant relationship with screening of mild dementia from MCI (p<0.05). Screening out mild dementia from MCI with verbal fluency will additionally require such qualitative analyses as semantic clustering, phonemic clustering, and switching.

Keywords: Naming, dementia, mild cognitive impairment, verbal fluency

1 Introduction

The early diagnosis that distinguishes dementia from the natural deterioration of cognition in the aging process is crucial.

Because many linguistic studies on dementia have proved that Confrontational Naming ability is damaged in the early stage of Alzheimer’s disease due to damage to semantic store, it has been used as language test method to screen out dementia [1].

In a more recent study, it has been reported that verbal fluency is a sensitive test to screen out Mild Cognitive Impairment (MCI), presymptomatic Alzheimer’s disease and mild dementia from normal seniors [2].

This study has explored the relationships among cognitive impairment, confrontational naming, and verbal fluency in community-dwelling seniors.
2 Methods

2.1 Study Population

This study targeted 624 seniors who completed Seoul Neuropsychological Screening Battery (SNSB) which was a one of the standardized neuropsychological test batteries widely used in Korea. Among them, Twenty-two subjects were excluded who were found to have undergone cognitive decline for reasons other than MCI or dementia (eg. pseudodementia). In addition, to limit the characteristics of the dementia group to mild dementia, six patients were also excluded with over the score of two in Clinical Dementia Rating (CDR) [3]. We used 594 persons (196 men, 398 women) in our analysis.

2.2 Measurement

The short version of Korean Boston Naming Test (S-K-BNT) [4] was used for confrontational naming. A point is added for every positive answer, giving a possible total score of 15.

For phonemic fluency, the Controlled Oral Word Association Test - phonemic /k/ (COWAT-phonemic) [4] was used, in which the test subject is required to respond with words that contain the Korean character /k/.

For semantic fluency, a Controlled Oral Word Association Test - semantic animal (COWAT-Animal) [4] was used, which requires words with animal names.

Age, gender, level of education, depression, and apolipoprotein epsilon4 genotype (APOE-e4) were included in the confounding factors.

2.3 Statistical analysis

For the comparison of the relationship between the naming test and cognitive impairment, the raw scores of the test were converted into a T-score, and the odds ratio and 95% confidence intervals were presented using multinomial logistic regression analysis. All analysis used IBM SPSS version 20.0 (IBM, Inc., Chicago, Illinois).

3 Results

In the results of the multinomial logistic regression analysis, all three naming tests showed a significant negative relationship with MCI and mild dementia in the case of the normal elderly (p<0.05). The relationship between naming and mild dementia with MCI as reference group is presented in Table 1. When all confounding factors were adjusted, confrontational naming and semantic fluency had a significant negative relationship with screening of mild dementia from MCI (p<0.05). However, the odds ratio of phonemic fluency was not significant.
Table 1. Logistic regression analyses of the association between mild dementia (compared with MCI) and naming performances

<table>
<thead>
<tr>
<th>Naming test</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The short version of Korean Boston Naming Test</td>
<td>0.93 (0.87, 0.99) *</td>
</tr>
<tr>
<td>Controlled Oral Word Association Test - Semantic</td>
<td>0.94 (0.88, 0.99) *</td>
</tr>
<tr>
<td>Controlled Oral Word Association Test - phonemic</td>
<td>0.96 (0.87, 1.05)</td>
</tr>
</tbody>
</table>

*p<0.05
This study was adjusted for age, sex, education, depressive symptoms, APOE-e4 and each of the naming tests.

4 Discussion

In this study, only confrontational naming and semantic fluency had significant negative relationships in screening out mild dementia from MCI. This result corresponds with that of a preceding study that found that confrontational naming had a significant relationship with the transition process from MCI to mild Alzheimer-type dementia, while phonemic fluency did not [5].

Therefore, screening out mild dementia from MCI with verbal fluency will additionally require such qualitative analyses as semantic clustering, phonemic clustering, and switching.

References