Lesion size and initial severity as predictors of aphasia outcome

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Introduction

The problem of aphasia prognosis after stroke has been the central issue of a number of studies. There is a growing body of evidence suggesting that lesion characteristics (including lesion volume) is the crucial predictor with regard to aphasia recovery (Plowman, Hentz, & Ellis, 2012; Maas et al., 2012; Hope et al., 2013). However, several contemporary studies point to initial severity as the most powerful predicting factor (Laska et al., 2001, Lazar et al., 2010). The aim of the present study is to investigate the effect of the two aforementioned variables on aphasia outcome.

Methods

24 left stroke patients were assessed in the acute (mean time post onset = 10,67 days, SD=7,51 days) and chronic (mean time post onset = 252, 58, SD=257,87) phase with the Boston Diagnostic Aphasia Examination-short form (BDAE-SF) (Goodglass and Kaplan, 1972), adapted in Greek (Tsapkini, Vlahou, and Potagas, 2009). On the basis of performance on specific BDAE-SF subscales an Aphasia Score (henceforth AS) was calculated according to Potagas, Kasselimis, and Evdokimidis (2011). MRI/CT scans were obtained for each patient and lesion loci were identified by two independent neuroradiologists. The total number of affected sites served as an index of lesion volume (henceforth lesion score).years old (mean: 60.15; SD: 14.75) were finally included in the analyses regarding Corsi block-tapping task.

Results

Paired sample t-test revealed significant difference between AS1 (acute phase) and AS2 (chronic phase) (t=,-5,736, df=23, p<0.005), thus indicating a satisfying degree of recovery. Possible relationships between AS1, AS2, and lesion score were initially investigated through Pearson r correlation analyses. Results indicated significant correlations between AS1 and AS2 (r=0.81, p<0.001), AS1 and lesion score (r=-0.50, p<0.05), and AS2 and lesion score (r=-0.59, p<0.005). Two subsequent partial correlations analyses were conducted: first, between AS1 and AS2 with lesion score as control variable, and then between AS2 and lesion score with AS1 as control variable. Results revealed that correlation between AS2 and lesion score does not reach significance, when AS1 is entered as control variable. In contrast, correlation between AS1 and AS2 remained significant, with lesion score serving as control variable. Finally, regression analysis with AS2 as the dependent and AS1 and lesion score as predictors, provided a statistically significant model (F4,17=11,031, p<0.005) which explained 66% of the predicted variable's variance (Adjusted R Square = .656). However, it was only AS1 that served as a significant predictor (beta=.669, p<0.005).
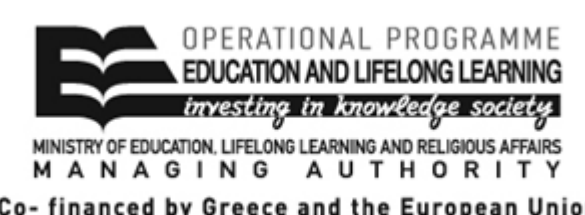
Discussion

There is an ongoing debate in the aphasia literature with regard to the relevant importance of specific prognostic factors. Our findings demonstrate that even though the extent of lesion seems to be related with severity in the chronic phase, it is initial aphasia severity that strongly predicts outcome. It should be however noted that our sample was small; therefore these results should be interpreted with caution. Further studies with larger samples investigating a larger number of possible predicting factors could elucidate the complex issue of predicting the evolution of aphasic symptoms right from the acute phase.

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