GERSTMANN’S SYNDROME IN ACUTE STROKE PATIENTS

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1. INTRODUCTION
Gerstmann in 1924. observed in a few patients a concomitant impairment in discriminating their own fingers, writing by hand, distinguishing left from right and performing calculations. He claimed that this tetrad of symptoms constituted a syndromal entity, assigned it to a lesion of the dominant parietal lobe. Since than, Gerstmann’s syndrome (GS) was enigma for neuropsychologists. The aim of this study was to analyze frequency and clinical features of GS among acute stroke patients. Patients and methods: We prospectively analyzed 194 acute stroke patients (average age 65±11.06 years, male 113 [58.2%], female 81 [41.8%] hospitalized at Department of Neurology, University Clinical Center Tuzla, during the six months in 2010. For clinical assessment of agraphia, alexia and acalculia we used Minnesota Test for Differential Diagnosis of Aphasia’s. Results: Among these acute stroke patients, 59 (30.40%) had alexia, agraphia and acalculia or different combinations of these disorders. Two patients (3.4%) had agraphia and acalculia associated with other part of tetrad of GS: finger agnosia and left-right disorientation. They both where men, right handed, and cranial computed tomography scan showed ischemic lesion in the left parietal and left temporoparietal lobe. Conclusion: Gerstmann’s syndrome is rare clinical entity, and has the high value in localization and the lesion is mainly localized to angular gyrus of the dominant hemisphere. Key words: Gerstmann’s syndrome, acute stroke.

2. PATIENTS AND METHODS
We prospectively analyzed 194 acute stroke patients (average age 65±11.06 years, male 113 [58.2%], female 81 [41.8%] hospitalized at Department of Neurology, University Clinical Center Tuzla, during the six months in 2010. The patients were evaluated in the first week of stroke, during the acute phase of disease. Diagnosis was based on clinical, neurological and neuroradiological findings (computed tomography and/or magnetic resonance). For clinical assessment of agraphia, alexia and acalculia we used Minnesota Test for Differential Diagnosis of Aphasia.

3. RESULTS
Among these acute stroke patients, 59 (30.40%) had alexia, agraphia and acalculia or different combinations of these disorders. In most of the stroke patients they were associated (59.3%) (Figure 1). Only two of patients (3.4%) had agraphia and acalculia associated with other part of tetrad of GS: finger agnosia and left-right disorientation. They both where men, right handed. In the absens of aphasia, apraxia, or other neuropsychological impairment (intelligence, memory and attention), they demonstrated all four Gerstmann symptoms. Cranial computed tomography scan showed isch-
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Ando et al. (5) indicates that Gerstmann syndrome can be caused by not only dysfunction of the left angular gyrus, but also of the left middle frontal gyrus in the dominant hemisphere. 

In association with other impairments such as aphasia, apraxia or sensorimotor deficits, Gerstmann’s syndrome has been described in numerous brain lesions, however, when accompanying deficits were moderate or absent, Gerstmann’s syndrome was produced by left parietal disease in right-handed patients (6, 7).

Rusconi et al. (4) tested Gerstmann’s hypothesis by performing in depth functional and structural neuroimaging in a series of a healthy subjects, and postulated that the Gerstmann tetrad is not functional, but structural. A lesion of separate but spatially convergent fiber pathways involved in the four domain would then cause this syndrome by way of disconnection. These findings shed an interesting light on the clinical consequences of damage to the dominant parietal lobe. Neither the constituent symptoms of Gerstmann syndrome nor lesion to this region of white matter are uncommon, but their selective association in pure Gerstmann syndrome is a seldom clinical event.

4. CONCLUSION

Gerstmann’s syndrome is rare clinical entity and regarding the localizing value these case reports have also confirmed Gerstmann’s statement that syndrome is associated with damage to the dominant parietal lobe. Undoubtedly, GS as enigma will continue to intrigue both, clinical neurologists and researchers in neuropsychology.

Conflict of interest: none declared.

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