

Speech disorders and speech postoperative outcome in patients with symptomatic epilepsy

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Introduction:

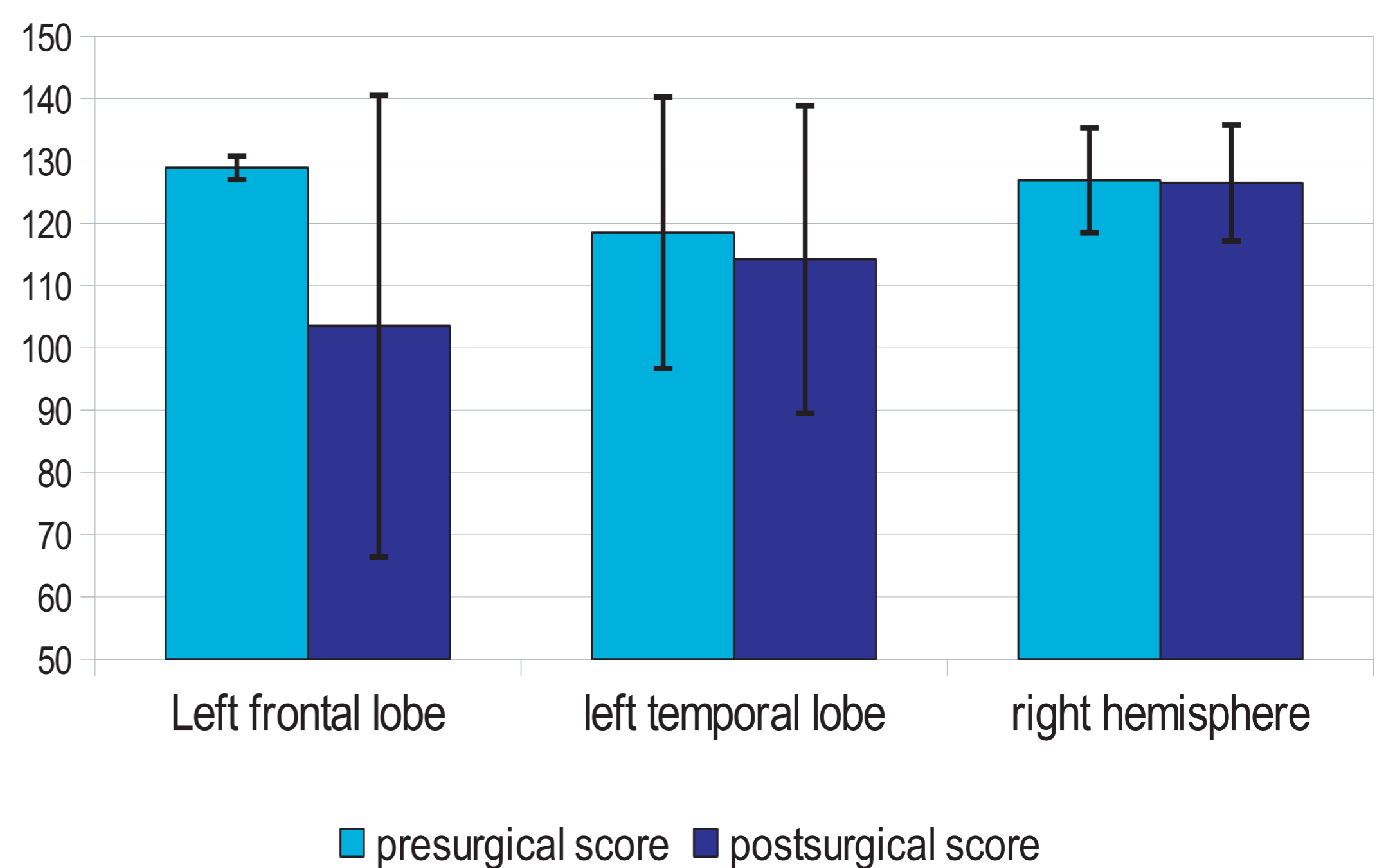
Speech disorders are common in patients with symptomatic epilepsy (Engel et.al., 2009). Postoperative speech decline is one of the main problems in the neurosurgical treatment of epilepsy. In this study we investigate the role of lateralization and localisation of brain tumors and seizure frequency in postoperative speech outcome.

Methods:

Pre- and postoperative (2 week after surgery) speech assessment: object naming, action naming tests, sentence production, sentence comprehension, word comprehension task [2].
Sample: 36 right-handed patients (21 female), 17-64 years. 26 patients with tumors in the left hemisphere (16 in the frontal and 10 in the temporal lobe) and 10 in the right hemisphere (5 in the frontal and 5 in the temporal lobe).

Results:

- Preoperative speech impairment was detected in all 26 patients with tumor in the left hemisphere and only in one patient with tumor in the right hemisphere. He had every day seizures.
- Patients with tumors in the left temporal lobe tended to have more severe speech impairments than patients with tumors in left frontal lobe ($\Phi_{crit}=1.524$, $p=0.06$).
- Postoperative significant speech decline was observed only in patients with tumors in the left frontal lobe ($df=15$, $Z = 2.652$, $P = 0.008$) and wasn't in patients with tumors in the left temporal lobe ($df = 9$, $Z = 0.593$, $P = 0.553$) and in the right hemisphere ($df=9$, $Z = 1$, $P = 0.317$).



Discussion & Conclusions

- These results allow us to suppose that: In case of tumor localization in the right hemisphere the high seizure frequency plays the crucial role in the speech decline.
- Patients with tumor localisation in the left frontal lobe have higher scores according to the preoperative speech assessment and show more severe speech decline postoperatively than patients with tumors in the left temporal lobe.
- This fact could be explained in the termes of brain plasticity: compensatory changes in the brain are more effecient in the patients with tumors in the left frontal, than in the left temporal lobe, but these new compensatory mechanisms of the left frontal lobe can be damaged very easy during tumor resection.
- There is congruent evidence that proves this suggestion: tDCS over the left inferior frontal cortex improves speech performance better than tDCS over the left temporal cortex.

References: Engel J., Pedley T.A. & Aicardi J. (2008) Epilepsy: A Comprehensive Textbook. 2nd ed. Lippincott Williams & Wilkins. P. 3056.
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