**Abstract**

**Introduction:** Disordered of complex mental activities that are the result of surgical operations are referred to as Post Operative Cognitive Dysfunction (POCD). Cognitive functions (abilities) include activities such as memory, thinking, linguistic and visual-spatial perception functions, as well as executive functions. The neuropsychological test are used for determination of cognitive dysfunctions. The reason for the occurrence of POCD has not been explained so far as it is a heterogeneous and multidimensional disorder, involving a complex relationship between pre-operative risk factors and numerous factors in the perioperative period. The patient's age, type of surgery and the extent of inflammation influence this phenomenon. POCD is most common after cardiac surgery, transplantation and oncological surgery. It is puzzling whether POCD may be a consequence of minimal invasive surgical procedures that require specific intraoperative conditions. This field is rapidly developing endoscopic surgery of the paranasal sinuses and base of the skull. Patients are operated in a pharmacological state of cardiovascular depression with stabilization of heart rate at the lower range of physiological values ​​and a reduction in mean arterial blood pressure to about 65 mm Hg. Thanks to this, the so-called an "open field" of surgery that ensures adequate management of general anesthesia using cardiovascular suppression, may potentially promote the development of a mild form of ischemic brain injury and, as a result, the POCD.

**Objective:** The aim of the study was to assess the risk of postoperative cognitive dysfunctions after endoscopic sinus surgery (FESS) in patients operated in the pharmacological state of cardiovascular depression with stabilization of heart rate in the lower range of physiological values ​​and reduction of mean pressure up to 65 mm Hg. In addition, the influence of stress factors on the patient's cognitive functioning was analyzed.

Material and methods: 40 patients qualified for FESS (study group) were tested. The control group consisted of 20 patients operated due to the benign tumors of the salivary glands or submardibular salivary gland calculi, and 20 patients operated under local anesthesia due to the nasal polyps.

Using neuropsychological tests, the cognitive abilities were compared before and up to a month after surgery. The study used a battery of neuropsychological tests: Mini-Mental State Examination (MMSE), Rey Complex Figure Test, Stroop Test, Verbal Fluency Test, Wisconsin Card Sorting Test (WCST). In addition, the respondents completed the STAI questionnaire, which is a tool designed to study anxiety understood as a transient and state of the individual and anxiety understood as a relatively constant personality trait.

The tests used in the study measured the level of cognitive abilities of the patient. The first measurement aimed to determine the average level of patient functioning, while the re-measurement was to indicate the possible occurrence of early or mild cognitive impairment as a consequence of the surgical operation (POCD).

In all patients, pre-operative and postoperative serom cortisol levels were examined. This procedure facilitated the assessment of the impact of stress related to planned surgery on cognitive functions. In addition, the level of serum C-reactive protein (CRP) was determined, informing about the inflammatory process.

**Results**: There was no negative effect of FESS on cognitive functions measured using selected neuropsychological tests. However, a decrease in preoperative cognitive results compared to the postoperative assessment was noted. Also, the level of anxiety as a condition before the surgery was higher. The higher serum cortisol levels were also observed. The obtained results indicate that FESS is an operation that does not involve the risk of cognitive impairment. A very interesting observation obtained during the conducted research is a definite improvement of the results of neuropsychological tests after surgery, both in the FESS and in the comparative group. The subjects obtained significantly better results in the STAI test after surgery, which indicates a reduction in the level of stress and tension associated with the surgery and an elimination of discomfort associated with the occurrence of chronic rhinosinusitis.

**Conclusions:**

1. Functional endoscopic sinus surgery (FESS) does not adversely affect the cognitive functioning of patients.

2. FESS improves the cognitive skills of patients with chronic rhinosinusitis.

3. Limited inflammation and reduced cortisol levels in FESS positively affects the cognitive functioning of patients.

4. The stress-related pre-FESS period increases the anxiety level assessed by the STAI X1 and X2.