**Introduction**

Sleep Apnea Syndrome (SAS) is the sleep apnea occurrence with a frequency of over 5 episodes per hour lasting for more than 10 seconds each accompanied by respiratory failure and other dysfunctions as well as severe sleepiness in the daytime. SAS is divided into two types: central and obstructive.

Central sleep apnea is a lack of signal from the central nervous system (CNS) to the inspiration muscles. This type associated with deep, often structural CNS affections which occurs relatively rare.

Obstructive sleep apnea syndrome (OSAS) or obstructive sleep apnea (OSA) is a periodic inhibition (hypopnea) or cessation (apnea) of airflow the due to constriction of the upper airway during sleep, often accompanied by hypoxemia and sleep disorders. In patients with diabetes mellitus (DM) in the case of acute stroke (AS) system inflammation, vascular disorders, coagulopathy, hyperglycemia and acidosis, which are characteristic of diabetes, may promote tissue ischemia and lead to complications of acute stroke, including respiratory disorders and occurrence of SAS.

Thus, in diabetic patients with acute stroke risk for OSA is high. However, the available literature, does not provide publications about the features of OSA in patients with comorbid acute stroke and diabetes, which necessitated the study.

**Objective**: To identify the frequency, features of the course and develop a correction scheme of breathing during sleep in diabetic patients with acute stroke.

**Materials and methods**

The study was conducted in the Kyiv’s Regional Clinical Hospital. There were examined 30 patients (18 men and 12 women) aged 46 to 82 hospitalized with acute stroke and comorbid diabetes. Stroke severity was assessed on the NIHSS scale. If patients were conscious or clear information from relatives was available, the assessment of existing anamnestic signs of OSA on the Epworth Sleepiness Scale was conducted. Screening for OSA severity was performed using complex SOMNOcheck micro (Weinmann, Germany). To assess the severity of OSA the apnea-hypopnea index (IAH) was determined: the total number of apnea and hypopnea episodes detected when monitoring for the entire period of sleep is divided by the total number of hours of sleep. IAH from 5 to 15 is considered to be mild OSA, from 15 to 30 – moderate OSA, patients with IAH ≥ 30 are diagnosed to have severe OSA. The episodes of apnea duration, a type of apnea (central or obstructive) and desaturation index (number of episodes of oxyhemoglobin decline more than 4% for 1 hour of sleep) were calculated. According to the number of obtained parameters there was determined OSA severity and the need for a respiratory support.

While identifying patients with "mild" OSA (IAH 5-15) there was conducted a "positional" therapy, which included a regular change of body position to maximize a reduction of the patient’s stay in the supine position. In patients with IAH ≥ 15 we applied noninvasive ventilation correction using two-level positive airway pressure in conjunction with the 40% fraction of oxygen in the air that is inhaled.

**Results and discussion**

Among the 30 patients examined, signs of OSA (IAH ≥ 5) were found in 19 patients (63.3%), who were included in the study group. 11 patients with no SAS (IAH <5) were included in the control group. It should be noted that in the main group of SAS patients men dominated (78.9 versus 27.3% in the control group), the NIHSS score was higher (14.3±3.7 vs 10.9±2.8) and obesity (body mass index ≥ 30 kg/m²) was increasingly manifested. A significant improvement in OSA between 1 and 3 days should be noted. In particular IAH was significantly decreased, the duration of sleep apnea episodes and the total apnoe duration per 1 hour of sleep were reduced. The length of the sleep period, during which the patient's blood saturation level below 85% was also decreased. Such improvement ventilation parameters was achieved by a sharp (almost 4 fold) reduction in the frequency of obstructive events, while the frequency of
central sleep apnea was not changed. Nevertheless, between 3 and 7 days somnography values did not change – none of the studied parameters were statistically significant difference, although there was a tendency to some results improvement. The same tendency found between 7 and 10 days of treatment. We can explain the fact that the basic risk factors for OSA, such as obesity, hypertension, metabolic syndrome, smoking, alcohol abuse, etc. can not eliminate for 3-7 days. Therefore, treatment of OSA in diabetic patients with AS should continue for a long time. Overall specified method of examination and respiratory therapy were well tolerated by patients. Side effects were rare and did not affect the overall outcome.

Conclusions

Probability of respiratory disorders during sleep in diabetic patients with acute stroke is high (in our study - 63.3%). Risk factors are male gender, obesity, high NIHSS score (≥15) before hospitalization. For the purpose of accurate and timely diagnosis of respiratory sleep disorders in all diabetic patients with acute stroke should be conducted at admission screening for respiratory failure with measurement apnea-hypopnea index, desaturation index and OSA severity assessment to determine the need and tactics respiratory support.