Central sleep apnea in patients with chronic heart failure and its treatment with acetazolamide

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Topic(s):
Chronic Heart Failure: Pharmacotherapy

Citation:
Introduction. Central sleep apnea (CSA) is a specific respiratory abnormality during sleep, defined as periodical cessation of breathing with the absence of respiratory flow as well as thoracic and abdominal breathing efforts. Cardiovascular prognosis for individuals with chronic heart failure (CHF) and CSA can be potentially worse.

Purpose. The aim of our study was to assess the incidence and risk factors for CSA in patients with CHF and to assess the effect of acetazolamide in such patients.

Methods. We have studied 37 consecutive adult patients (35 males and 2 females) with CHF ranged from II to III New York Heart Association (NYHA) functional classes. All patients got standard medication. Patients with chronic respiratory failure, renal failure, previous stroke, anemia and obesity were not included. All patients underwent echocardiographic investigation, 6-minute walking test, arterial blood gases test and cardio-respiratory monitoring during sleep. Sleep and life quality questionnaires were also obtained. Patients with apnea-hypopnea index (AHI) more than 15 events per hour were considered as suffering from CSA.

Results. CSA was found in 62% of observed patients (23/37). There were no significant differences between the groups in age, gender, heart rate or blood pressure. Mean SpO2 during sleep was 91.8±0.8% among the patients with CSA, and 94±0.8% in the control group (p>0.05). Mean pCO2 in arterial blood in patients with or without CSA were 35.2±0.5 mm Hg and 35.0±0.9 mm Hg, respectively (p>0.05). Mean distance walked in 6 minutes was 297.1±23.2 meters in group with CSA and 310.1±32.6 meters among the other patients (p>0.05). According to the questionnaires there was no significant difference in sleep and life quality in both groups.

18 patients with CSA were randomized into two groups. In group I patients received acetazolamide and standard medical treatment (8 patients). Control group without acetazolamide admission consisted of 10 persons. In 6 months patients in group I showed significant decrease in AHI (from 33.14±3.9 to 14.7±4.0). In the control group there was no significant change in AHI (22.84±1.1 and 21.68±3.9). In a 12-month period was revealed a decreasing tendency in cardiovascular mortality among patients receiving acetazolamide (1 patient in group I and 4 patients in group II) (?>0.05).

Conclusions. Considering the results of the study we can conclude that the prevalence of CSA in CHF patients is up to 60%. Patients with CSA showed no tendency to lower exercise tolerance or lower levels of CO2 in arterial blood. Taking into account that patients in both groups did not differ by heart failure severity, received data contradict the idea that lower left ventricular ejection fraction and lower pCO2 levels lead to CSA in patients with CHF. Administration of acetazolamide result in decrease of respiratory disorders during sleep and probably decrease cardiovascular mortality in such patients.