Letter to the Editor

Should Cardiologists Treat Cheyne-Stokes Respiration and Congestive Heart Failure With Oxygen, Bi-Level/Continuous Positive Airway Pressures or Drugs Alone?

To the Editor:

We read the interesting papers in this Journal dealing with the treatment of patients with congestive heart failure suffering from Cheyne-Stokes respiration and central sleep apnea; one on home oxygen therapy (HOT) by Sasayama et al1 and the other on bi-level positive airway pressure (Bi-PAP) by Kasai et al2 Since Cheyne-Stokes respiration in heart failure, characterized by repetitive central apneas alternating with a crescendo–decrescendo tidal volume, is acknowledged to be highly prevalent; an indicator of a poor prognosis; and possibly a therapeutic target; both papers have clinical relevance as useful updates.

Regarding the effects of HOT of 8.5 h per night for 3 months, the left ventricular ejection fraction (LVEF) was increased, apnea–hypopnea and oxygen desaturation during sleep were ameliorated, and the Specific Activity Scale was improved compared with age/severity matched patients treated with drugs alone. Although Sasayama and his coworkers performed polysomnography at the endpoint, data on sleep quality were lacking after 3 months with HOT. Nonetheless, such sleep data as frequent arousals and subsequent sleep fragmentation must be the important factors that serve to stabilize respiration during sleep and improve quality of life during daytime wakefulness.

Regarding the effects of nightly Bi-PAP for 3 months (duration of Bi-PAP use per night was not identified); the LVEF was increased, plasma brain natriuretic peptide concentration was decreased, and New York Heart Association functional class was improved compared with the control patients treated with drugs alone. However, the investigators did not perform polysomnography in any form at the endpoint and, hence, changes in respiration and sleep quality after 3 months with Bi-PAP could not be assessed. Considering that HOT or Bi-PAP for sleep disordered breathing could be a life-long treatment and that mortality of patients with heart failure is relatively low in Japan compared with Western populations; the 3 months’ duration of both studies might be short.

Very recently, a large (258 patients were enrolled), long-term (mean follow-up was 2 years), prospective and randomized clinical trial (CANPAP) on the effects of continuous positive airway pressure (CPAP) for patients with central sleep apnea and heart failure was completed by Bradley et al6 They concluded that CPAP did not improve survival despite its benefits on cardiac function and sleep-disordered breathing after 24 months of CPAP for 3.6 h per night. However, a concurrent improvement with a change of drug therapy for the enrolled subjects (especially, routine use of beta-blockers), the titration technique of CPAP, and short use of nightly CPAP might have affected the outcomes. Since successfully treating an 81-year-old patient with ischemic cardiomyopathy suffering from central sleep apnea with CPAP of 5 cmH2O for 3 years; we have come to believe that hydrostatic benefit is achievable with a CPAP level lower than the conventional 10.0–12.5 cmH2O recommended by Bradley et al (upward titration technique). In this patient, who has used CPAP for the past 7 years, the pressure was increased by 3 cmH2O after 24 months and then by 2 cmH2O after 36 months to cope with the decline in cardiac function. Thereafter, we applied this strategy to 5 consecutive heart failure patients with central sleep apnea for 6 h per night for 1 year with success.

Any of the aforementioned clinical investigations lacked the power to conclude with certainty that nightly oxygen, Bi-PAP or CPAP is effective in improving the morbidity or mortality of patients with congestive heart failure; The interaction among sleep, respiration and circulation is a newly developing field in cardiology (the so-called new cardiovascular frontier), as indicated by the fact that only 17 years have passed since one of the earliest studies dealing with Cheyne-Stokes respiration in congestive heart failure appeared in this Journal!

References


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