

## The benefits of cardiac rehabilitation for patients with sleep apnea

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### Editorial

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Sleep apnea (SA) is the most common type of breathing-related sleep disorders, defined as a frequent stop and start breathing.<sup>1</sup> SA is characterized by symptoms such as frequent snoring, silent pauses in breathing, choking and breathing symptoms, sleepiness or daily fatigue, insomnia and frequent waking up during the night, morning headaches, not refresh and uneasy feeling after awakening, and irritability and mood changes.<sup>2</sup> In this disorder, breathing stops occur more than 30 times during sleep, and continue a few seconds to minutes.<sup>1</sup>

SA, which is an independent risk factor for cardiovascular disease, affects 38,000 heart deaths each year.<sup>3,4</sup> SA is common among 50-66 percent of patients with heart diseases, and generally leads to numerous health outcomes.<sup>5,6</sup> Increased blood pressure due to SA, decreased left ventricular function and central blood flow, myocardial damage, heart rate fluctuations, systemic infection, endothelial dysfunction, increased sympathetic activity, and metabolic abnormalities are among the most important outcome of SA in patients with cardiovascular diseases.<sup>4,5</sup>

Appropriate treatments for SA include automatic positive airway pressure (APAP) and continuous positive airway pressure (CPAP). Advantages of the APAP method include fluctuation between low and high level pressure during the whole night, and automatically adjust the pressure level, automatic elevation of pressure, and uniform maintenance of pressure level set by patient itself. The limitations of this therapeutic approach are APAP algorithm varies from one person to another; sometimes slowing the pressure change during apnea events, and expensive.<sup>1</sup> The CPAP method, as a non-invasive treatment, quickly relieves symptoms, and alleviates heart problems. An increase in expiratory effort, sense of forced air through the nostrils of the patient, and uniform maintenance of pressure level set by the physician are among the CPAP constraints.<sup>1</sup> This treatment is

generally associated with positive outcomes such as decreased blood pressure caused by SA, and improving the function of the left ventricle and oxygenation.<sup>5</sup> Despite the usefulness of the APAP and CPAP, SA screening in Iranian patients with cardiovascular diseases is not a routine. For this reason, in most cases, this problem remains underdiagnosed, and without a proper treatment.

Although the aforementioned treatments have been used relatively successful for many years, recent studies have shown that cardiac rehabilitation (CR) can be considered as a new treatment for SA.<sup>5</sup> CR reduces the severity of SA by 55% through improving  $VO_2$  peak by 20-27 percent.<sup>7-10</sup> Physical exercise and regular exercise in CR can regulate the autonomic nervous system, and reduce the severity of SA.<sup>10</sup>

In spite of sufficient evidence regarding the usefulness of CR in significantly reducing morbidity and mortality,<sup>11</sup> Iranian patients tend to have very little to participate in these programs. In Iran, less than 20% of patients [mostly those with coronary artery bypass graft (CABG)] refer to CR, and almost half do not complete the sessions.<sup>12-14</sup> Not surprisingly, patients with heart failure, valve heart surgery, percutaneous coronary intervention, or myocardial infarction are also not generally encouraged by experts to enroll in CR. Therefore, the number of patients with cardiovascular diseases enrolled in the CR is limited to a number of patients with CABG. Based on these considerations, the numbers of patients with cardiovascular diseases with underdiagnoses/diagnosed SA, who benefits from CR, are very small.

Obviously, SA is a treatable and modifiable disorder.<sup>4</sup> The above-mentioned literature refers to the benefits of exercise and CR in controlling and reducing the severity of this disorder. CR is effective in controlling and improving SA, though weight loss and body mass index (BMI), modifying the diet, increasing cardiorespiratory fitness,

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enhancing  $VO_2$  peak, decreasing leg fluid accumulation, and preventing the nocturnal rostral fluid shift implicated in upper airway collapse.<sup>15</sup> Moreover, other reports refer to the combination of exercise training with ventilation therapy to achieve more positive outcomes.<sup>16</sup> In sum, CR seems to be a potential replacement therapy or complement for existing treatments. However, further studies are needed to confirm this claim.

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### Conflict of Interests

Authors have no conflict of interests.

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