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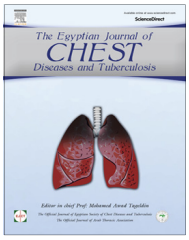

ORIGINAL ARTICLE

Study of sleep related respiratory disorders in patients with idiopathic pulmonary arterial hypertension

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KEYWORDS

Pulmonary arterial hypertension;
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Abstract The effects of sleep-disordered breathing (SDB) and nocturnal hypoxemia on pulmonary hemodynamics have long interested physicians who manage patients with pulmonary arterial hypertension. The aim of the present study is to study the prevalence and identify the types of sleep related breathing disorders in patients with IPAH in the state of Kuwait.

Patients and methods: 36 patients(32 females and 4 males) were included, the mean age was 35.2 ± 17.3 years, all patients were non-smokers and non-obese. All patients were subjected to routine investigations, Echocardiography, CT pulmonary angiography and full night polysomnography. All cases pulmonary hypertension related to cardiac disease or collagenic vascular disease or Thromboembolic disease were excluded.

Results: The mean AHI was 13.8 ± 8.3/h of sleep with OSA proved in 5 patients (13.9%) and CSR/CSA proved in 2 patients (5.56%). Nocturnal desaturation was more pronounced in the studied patient as 27 patients (75%) showed nocturnal desaturation. There was a significant correlation between SDB measures and baseline oxygen saturation, lowest oxygen saturation during walking and mean PAP.

Conclusion: SDB is significant in patients with IPAH and can affect the disease progression and the quality of life of those patients. All patients should undergo sleep study to identify patients who are in need of nocturnal oxygen therapy or in need for CPAP therapy in case of OSA.

Introduction

Pulmonary hypertension (PH) is defined by a mean pulmonary artery pressure ⩾25 mm Hg at rest, measured during right heart catheterization. There is still insufficient evidence to add an exercise criterion to this definition [1]. The term pulmonary arterial hypertension (PAH) describes a subpopulation of

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patients with PH characterized hemodynamically by the presence of pre-capillary PH including an end-expiratory pulmonary artery wedge pressure (PAWP) ⩽15 mm Hg and a pulmonary vascular resistance >3 Wood units. Right heart catheterization remains essential for a diagnosis of PH or PAH [2,3].

Primary pulmonary hypertension (PPH) is a rare disease characterized by elevated pulmonary artery pressure with no apparent cause. PPH is also termed precapillary pulmonary hypertension or, as is currently preferred, idiopathic pulmonary arterial hypertension (IPAH) [4].

The effects of sleep-disordered breathing (SDB) and nocturnal hypoxemia on pulmonary hemodynamics have long interested physicians who manage patients with pulmonary arterial hypertension (PAH). SDB, a term that encompasses the spectrum of Cheyne-Stokes respiration/central sleep apnea (CSR/CSA), obstructive sleep apnea (OSA) and nocturnal desaturation, is a common condition in the United States and western nations [5].

Sleep causes a profound effect in individuals with severe pulmonary disease, by its influence on the respiratory drive, airway stability, and ventilatory mechanics [6,7]. Reported sleep disturbances in patients with pulmonary disease include unsuspected obstructive sleep apnea and a high prevalence of insomnia, excessive daytime sleepiness, and nightmares compared to the general population, in addition, patients with COPD, kyphoscoliosis, and neuromuscular disorders have been shown to frequently desaturate, especially during rapid eye movement (REM) sleep [8–10]. Nocturnal hypoxemia can lead to polycythemia, respiratory failure, and pulmonary hypertension. Hypoxemia causes pulmonary vasoconstriction and elevated pulmonary artery pressures. In patients with PPH, untreated and unsuspected nocturnal hypoxemia can have deleterious effects and may worsen the pulmonary hypertension.

Aim of the work

The aim of the present study was to study the prevalence and identify the types of sleep related breathing disorders in patients with IPAH in the state of Kuwait.

Patients and methods

This study was carried out at the Pulmonary Rehabilitation Center – Pulmonary Hypertension Unit which is the only specialized unit to mange IPAH patients in the Ministry of Health, state of Kuwait.

The study was a retrospective study including all patients with IPAH seen in the unit in the last 6 years from Jan 2009 to Dec 2014 and still under follow up in the outpatient clinic. Study was approved by the ethics committee in the MOI, state of Kuwait.

This study was performed on (36) 1PH patients (4) males and (32) females with age ranging from 18 to 65 years.

Inclusion criteria

Adult patients proved to have IPAH without any co-morbidity at the time of diagnosis.

Exclusion criteria

- Patients with BMI >35.
- Patient with COPD or chronic lung disease.
- Patient with Connective tissue diseases.
- Patient with Thromboembolic disease.
- Patients with PH secondary to heart disease or patients with congestive heart failure.
- Patients already diagnosed with SDB or on long term oxygen therapy.

- PEulmonary hypertension was confirmed by right heart catheterization and was defined as a mean pulmonary artery pressure of >25 mm Hg at rest or >30 mm Hg during exercise [4].
- Functional class was estimated according to New York Heart Association (NYHA) classification [11].

To diagnose IPH, secondary causes of pulmonary hypertension were ruled out in all patients by

- Full history taking with stress on: chest symptoms, special habits especially smoking, cardiac symptoms.
- Physical examinations.
- Chest radiographs.
- High-resolution CT scans and CT pulmonary angiography.
- Pulmonary function studies.
- Transthoracic echocardiograms and transesophageal echocardiograms.
- Ventilation–perfusion scans.
- Right and left heart catheterization.
- Screening for connective tissue diseases.

For evaluation of sleep related breathing disorders patients were subjected to

- Thorough history taking about sleep symptoms.
- Physical examinations with stress on: Neck circumference.
- Body mass index (BMI). Calculation of Body mass index (BMI): The used method for estimation of the body mass index was the weight–height index according to the following equation [12].
- BMI = weight (kg)/height^2 (m^2).
- Epworth sleepiness scale (ESS) [13].
- Arterial blood gases.
- The 6-min walk test [14].
- Oxygen saturation by pulse oximetry (SpO_2) was measured at rest and during ambulation.
- Polysomnography (PSG): Full night polysomnography involving the recording of electroencephalography (EEG) electro-oculography (EOG), submental and anterior tibial electromyography (EMG), electrocardiography (ECG), respiratory effort (abdominal and thoracic effort), nasal airflow sensor and oxygen saturation (pulse oximetry) and position detection camera. Polysomnography used in this study is a full night polysomnography (Alice 4 Respironics), according to polysomnography OSA was diagnosed if the Apnea/Hypopnea index (AHI) is more than 5/h of sleep with more than 50% of all apneas occurring during sleep are of obstructive nature, CSR/CSA was diagnosed if there