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Research Article

FREQUENCY OF PATIENTS PRESENTING WITH OBESITY-HYPOVENTILATION (PICKWICKIAN) SYNDROME AT A TERTIARY CARE HOSPITAL

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Abstract:

Background: Obesity, around the world, is becoming more and more common. With greater prevalence, more of the mal-effects have begun to manifest, among which obesity-hypoventilation syndrome is the most under-rated, seldom-recognized and mostly un-diagnosed condition, despite its serious impact on the quality of life of an individual. **Objective:** This research hopes to study the frequency of obesity-hypoventilation (pickwickian) syndrome among patients presenting at a tertiary care hospital. **Methodology:** The study was carried out on patients presenting at department of pulmonology (chest medicine) at Liaquat University Hospital from June 2016 to June 2017. The data was collected using a structured interview based questionnaire and relevant investigations after taking written informed consent and all necessary measures were employed to ensure anonymity of the data subjects. The data obtained was analyzed using Microsoft Excel 2016 and SPSS v. 21.0. The frequency of patients was analyzed and its trends studied against gender, sociodemographic variations and time of the year. **Results:** 13 male and 12 female patients presented with obesity-hypoventilation syndrome in the designated study duration. Among the total 25 patients, 1 patient belonged to the lower economic class, 7 belonged to the middle economic class and 17 patients belonged to upper economic class. Most patients presented during the winter months and least during the summer months. The mean BMI of the subjects stood at 31 kg/m² and the mean age was recorded to be 54 years. **Conclusion:** After careful consideration, the results make it abundantly clear that, patients with obesity-hypoventilation syndrome scarcely, but do present at tertiary care hospitals at our settings. What is worrisome however, is that with the predicted increase in obesity, the frequency of patients may rise and thus healthcare professionals should practice vigilantly and advise appropriate investigations, especially arterial blood gasses whenever the disease is suspected in obese patients.

Keywords: Obesity, Hypoventilation, Pickwickian Syndrome, Hypercapnia and Hypoxemia.

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INTRODUCTION:

Obesity is becoming a major medical concern in several parts of the world, [1] with huge economic impacts on health-care systems, [2] resulting mainly from increased cardiovascular risks. [3] At the same time, obesity leads to a number of other mal-effects, among which obesity-hypoventilation syndrome is the most under-rated, seldom-recognized and mostly un-diagnosed condition, [4] despite its serious impact on the quality of life of an individual. [5] The condition also leads to increased morbidity and mortality. [6] Obesity hypoventilation syndrome is distinct from other sleep-related breathing disorders [7] although overlap may exist. [8] Obesity hypoventilation syndrome patients may have obstructive sleep apnea/hypopnea [9] with hypercapnia [10] and sleep hypoventilation, [11] or an isolated sleep hypoventilation. [12]

The World Health Organization (WHO) defines “overweight” as a body mass index (BMI) equal to or more than 25kg/m², and “obesity” as a BMI equal to or more than 30kg/m². Obesity is further classified into 3 classes — class 1 obesity (BMI, 30-34.9 kg/m²); class 2 obesity (BMI, 35-39.9 kg/m²) and class 3 obesity (BMI, ≥40kg/m²), with increasing morbidity in proportion to increasing BMI. The organization estimates that by year 2015, around 2.3 billion adults will be overweight and more than 700 million will be obese.

The interaction between obesity and respiratory system is not straightforward, as one affects the other via several mechanisms. [13] Excessive fat accumulation over the chest and abdomen adversely affects lung respiratory system mechanics, [14] leading to physiological derangement and functional impairment, which can be reversed in some subjects following weight loss. [15] Of note is the point that the distribution of body fat seems to be more important than total body fat and BMI per se. [16, 17] Obesity leads to reduction in chest wall compliance

and respiratory muscle endurance with increased airway and chest wall resistance. [18] In addition, there will be loss of expiratory reserve volume accompanied in cases of morbid obesity, with reduction in total lung capacity and functional residual capacity. [19-25] Obesity hypoventilation syndrome is defined as the combined presence of obesity (BMI,>30kg/m²) with awake arterial hypercapnia (PaCO₂ >45mmHg) in the absence of other causes of hypoventilation. [26]

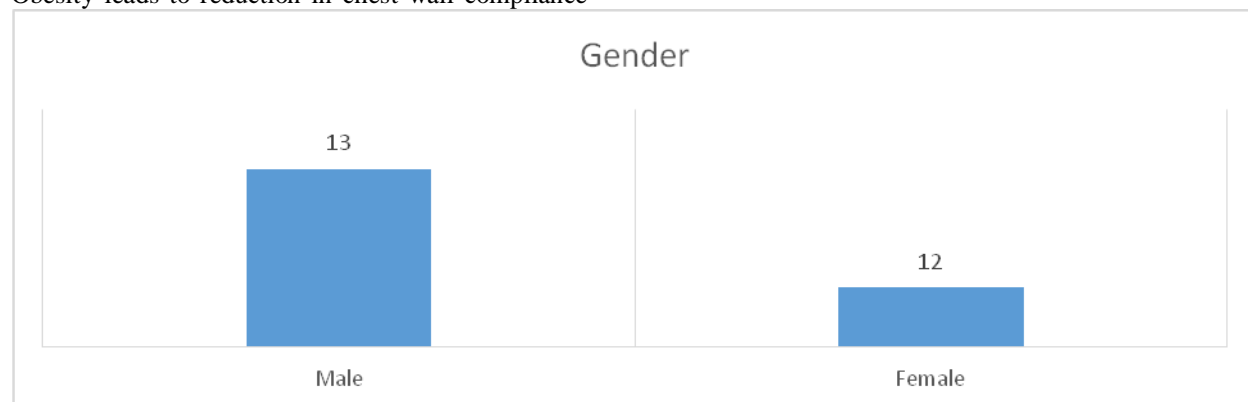
As stated earlier, despite its major impact on health, this disorder is under-recognized and under-diagnosed. Available management options include aggressive weight reduction, oxygen therapy and using positive airway pressure techniques. This research hopes to study the frequency of obesity-hypoventilation (pickwickian) syndrome among patients presenting at a tertiary care hospital.

METHODOLOGY:

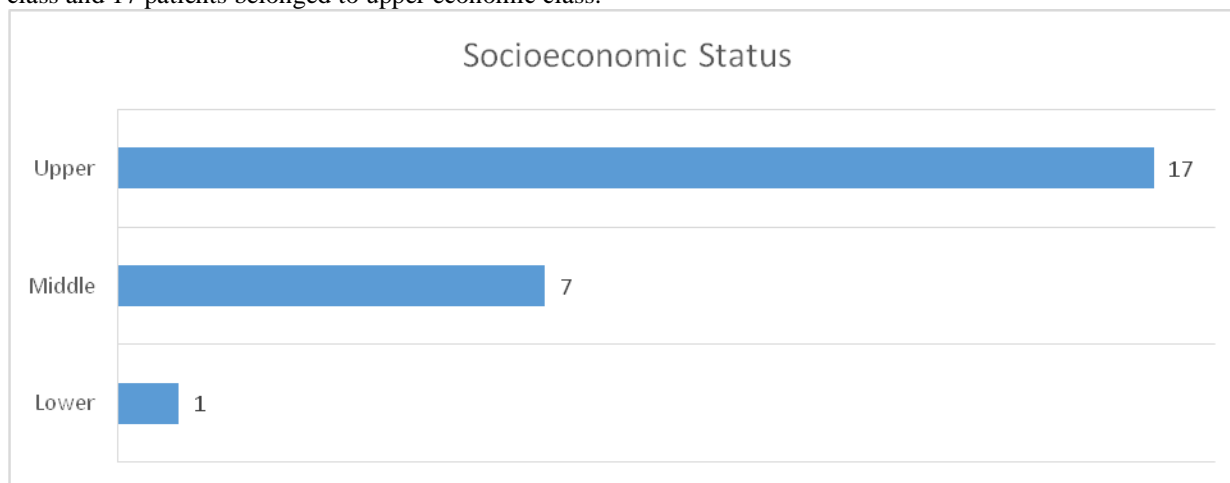
The study was carried out on patients presenting at department of pulmonology (chest medicine) at Liaquat University Hospital from June 2016 to June 2017. The data was collected using a structured interview based questionnaire and relevant investigations after taking written informed consent and all necessary measures were employed to ensure anonymity of the data subjects. The data obtained was analyzed using Microsoft Excel 2016 and SPSS v. 21.0. The frequency of patients was analyzed and its trends studied against gender, sociodemographic variations and time of the year. Diagnosis was based on the patient’s arterial blood gasses result and the level of hypercapnia and hypoxemia.

RESULTS:

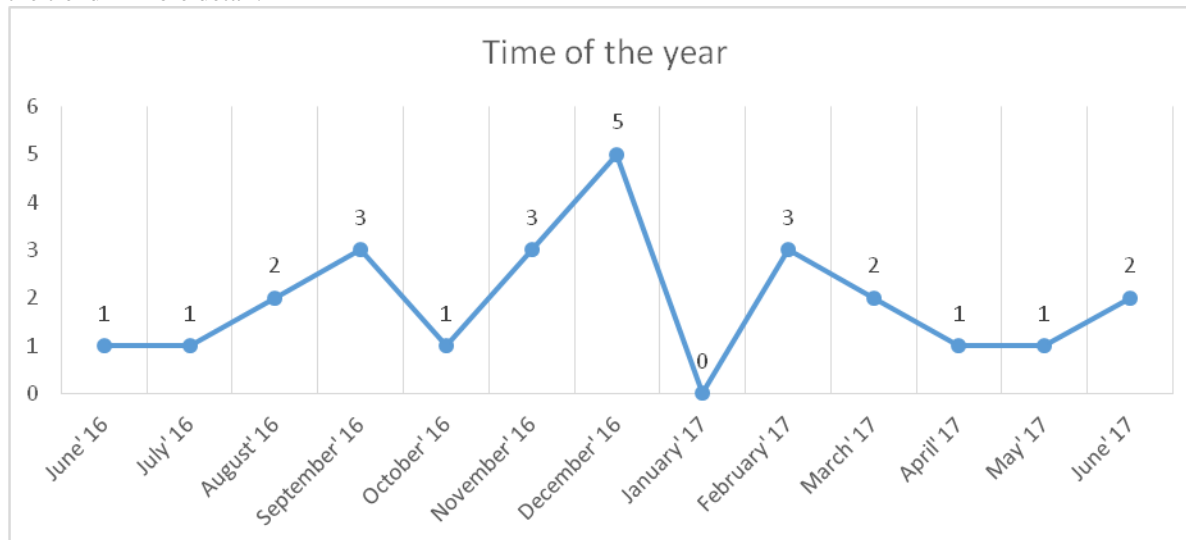
The mean BMI of the subjects stood at 31 kg/m² and the mean age was recorded to be 54 years. 13 male and 12 female patients presented with obesity-hypoventilation syndrome in the designated study duration.



Among the total 25 patients, 1 patient belonged to the lower economic class, 7 belonged to the middle economic class and 17 patients belonged to upper economic class.



Most patients presented during the winter months and least during the summer months. The graph below presents the trend in more detail.



DISCUSSION:

The exact prevalence of OHS in the general population remains unknown, and most prevalence data describe subjects with obstructive sleep apnea, wherein its prevalence has been estimated to range from 10% to 38% in different groups. [27-31] Nowbar and colleagues reported the prevalence of OHS among hospitalized adult patients with a BMI > 35kg/m² to be 31% after ruling out other causes of hypercapnia. [32]

Additionally, OHS patients were reported to be heavy users of health-care resources. Berg et al. reported OHS patients to have higher health-care utilization several years prior to evaluation and treatment of their sleep breathing disorder. [33] There was a substantial reduction in “the number of days of

hospitalization” once the diagnosis was made and treatment instituted. [34]

The classic presentation is an obese middle-aged male (usually BMI, $\geq 35\text{kg/m}^2$) with excessive daytime sleepiness and neurocognitive function impairment. Due to the simultaneous occurrence of obstructive sleep apnea in the majority of patients, symptoms like snoring, witnessed apneas and poor sleep quality with early morning headache and reduced performance are reported

Clinical examination confirms the high BMI and might display signs of cor-pulmonale and secondary pulmonary hypertension. Measuring oxygen saturation noninvasively by pulse oxymetry reveals reduced SpO₂. An arterial blood gas taken when

breathing room air confirms the presence of low PaO₂, PaCO₂ and a high bicarbonate level, signifying the chronic nature of the process. [15, 32] Blood tests include complete blood count to rule out secondary erythrocytosis, and thyroid function test to rule out severe hypothyroidism.

Despite our best efforts, we could not find any literature till-date that checked the individual frequency of obesity hypoventilation among different genders, socioeconomic classes. Neither could we unearth any evidence regarding the individual frequencies of presentation of patients presenting with obesity hypoventilation syndrome during different months of the year.

CONCLUSION:

After careful consideration, the results make it abundantly clear that, patients with obesity-hypoventilation syndrome scarcely, but do present at tertiary care hospitals at our settings. What is worrisome however, is that with the predicted increase in obesity, the frequency of patients may rise and thus healthcare professionals should practice vigilantly and advise appropriate investigations, especially arterial blood gasses whenever the disease is suspected in obese patients.

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