Obesity Hypoventilation Syndrome (Pickwickian syndrome) with Obstructive Sleep Apnoea
R Kushwaha, S Verma, V Mahajan, R Singh, R Prasad

Citation

Abstract
A 48 year old obese male with symptoms of obesity hypoventilation syndrome (Pickwickian syndrome) and obstructive sleep apnoea was admitted to our department. He was put on non invasive positive pressure ventilation and showed dramatic clinical response.

INTRODUCTION
Obesity Hypoventilation Syndrome (Pickwickian syndrome) is characterized by the combination of obesity (BMI > 30 Kg/m²), hypoventilation and daytime hypercapnoea (PaCO₂ > 45 mm of Hg). Obesity Hypoventilation Syndrome (Pickwickian syndrome) can coexist with Obstructive sleep apnoea. Here we are reporting a type of case in 54 year old male.

CASE REPORT
A 48 years old male, non smoker, shop holder by occupation, was admitted to our department with the complaints progressive increase in breathlessness, swelling over face and feet since the past 6 months. The patient had history of hypertension and diabetes mellitus for the last 5 years. He had no history suggestive of any chronic respiratory diseases. His resting pulse rate was 102/min, regular; respiratory rate was 38/ min and blood pressure was 144/94 mm Hg. His general examination revealed obesity with weight of 98 kg (Body Mass Index 34) and cyanosis. The abdomen was fatty and pendulous. There was no pallor, lymphadenopathy, clubbing, or visible icterus. Examination of chest revealed harsh vesicular breath sounds. His Arterial Blood Gas revealed pH; 7.34 PO₂; 38 mm Hg, PCO₂; 65.8 mm Hg, O₂ saturation; 68%( without oxygen). His blood biochemistry was within normal limits. His chest X-ray was within normal limits. His 2D Echo revealed dilated RA and RV with pulmonary hypertension of 46 mmHg with EF of 60 %. His central nervous system examination was within normal limits. During hospital stay his attendants also give history of loud snoring, nocturnal awakenings, morning headache and day time sleepiness. So to rule out obstructive sleep apnea her polysomnography was done. His polysomnography revealed Apnoea Hypopnoea Index of 16.4 /hours (Fig: 1).

Figure 1
Figure 1: Polysomnography revealed Apnoea Hypopnoea Index of 16.4 /hours.

He had no other known cause of hypventilation. Thus diagnosis of Obesity Hypoventilation Syndrome (Pickwickian syndrome) with obstructive sleep apnea was made. He was put on oxygen 1 litre/ min and nasal C-PAP at setting of 6mm of H₂O (5 hours/night). His daily assessment of ABG revealed dramatic clinical improvements (shown in table-1)
DISCUSSION

The causes of hypoventilation syndrome are central alveolar hypoventilation (drug induced, cerebrovascular accidents, trauma and neoplasm), chest wall deformity (kyphoscoliosis, fibrothorax and postthoracoplasty), neuromuscular disorder (myasthenia gravis, amyotrophic sclerosis, gullian baires syndrome and muscular dystrophy) and Obesity related hypoventilation syndrome. Obesity Hypoventilation Syndrome (OHS) is well known cause of hypoventilation. In 1956 association of obesity, somnolence and polycythemia, the name of pickwickian syndrome was given by Burwell, Robin and co-workers. They defined the major features of the syndrome. They suggested that this association be named the pickwickian syndrome because they resembled the description of Joe, the fat boy, in Charles Dickens’ book The Posthumous Papers of the Pickwick Club, commonly called the “Pickwick Papers”. Increase in obesity leading to reduced compliance of the chest wall and reduction in functional residual capacity that causes hypoventilation. When the body mass index was > 50/m², hypoventilation was seen in 48 % obese subjects. Clinical features of Obesity Hypoventilation Syndrome (Pickwickian syndrome) are obesity, hypersonolescence , cyanosis, periodic respiration , polycythemia, chronic day time hypercapnoea, hypoxaemia and right heart failure( as in present case also). The obstructive sleep apnea (OSA) syndrome is said to be present when apnoea hypopnoea index is greater than 15 events per hour, (in present case it was 16.4/hour). The proportion of Obesity Hypoventilation Syndrome in whom obstructive sleep apnea (OSA) syndrome is present may range between 73.8 and 88.5. Risk factors for OSA are obesity( as in present case), neck size ( collar size >17 inches in males and 15 inches in females), in present case it was 16.1 inches, tonsillar hypertrophy, deviated nasal septum, retrognathia or micrognathia, specific genetic disorder ( e.g. Treacher Collins, Downs Syndrome, Alpert syndrome), genetic predisposition, endocrine disorder( hypothyroidism, acromegaly), alcohol, sedatives or hypnotics.

In Obesity Hypoventilation Syndrome weight loss of atleast 10 kg results in significant improvement in vital capacity and maximal voluntary ventilation and significant reduction in day time PaCO₂. Although data is limited, weight loss has been shown to significantly increase central ventilatory drive as measured by diaphragmatic electromyogram response to carbon dioxide inhalation. But optimal amount of weight loss has not been studied. At present treatment of choice for the patients with OHS and OSA is nasal CPAP. It reduces the number of apneic and hypoxic episodes during sleep and to reduce day time sleepiness and improved neuropsychiatric function. The optimal pressure of 5 to 20 cm H₂O is needed to abolish the apneic episodes, snoring and oxyhaemoglobin saturations in all postions and during REM sleep. But a subset of patients with OHS and OSA that don't respond to nasal C-PAP, requires mechanical ventilation.

In the conclusion, the case presented above had a many medical problems. The morbid obesity was the cause as well as the effect of his sleep disordered breathing. His sleep related breathing disorder remained undiagnosed and untreated for many years ultimately requiring non invasive ventilation.

CORRESPONDENCE TO
Dr.R.A.S. Kushwaha M.D. Associate Professor Department of Pulmonary Medicine C.S.M. Medical University, Lucknow(India)-226003 E-mail: kushwaharas_kgmu@rediffmail.com Phone: 0522-2255167 FAX: 0522-2255167

References
Obesity Hypoventilation Syndrome (Pickwickian syndrome) with Obstructive Sleep Apnoea

Author Information

RAS Kushwaha
Assistant Professor, Department of Pulmonary Medicine, C.S.M. Medical University

Sanjay Kumar Verma
Senior resident, Department of Pulmonary Medicine, C.S.M. Medical University

Vineet Mahajan
Junior resident, Department of Pulmonary Medicine, C.S.M. Medical University

Rajni Singh
Junior resident, Department of Pulmonary Medicine, C.S.M. Medical University

R. Prasad
Professor & Head, Department of Pulmonary Medicine, C.S.M. Medical University