

Case Report

Late Onset Central Hypoventilation Syndrome with Hypothalamic Dysfunction in a Kuwaiti Girl

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ABSTRACT

Late onset central hypoventilation syndrome (LO-CHS) is now considered a well-established disease that develops in previously normal children after infancy and has been regarded as a distinct entity from the congenital central hypoventilation syndrome (CCHS). Both conditions are

associated with neural crest tumours, but hypothalamic dysfunction (HD) is a feature of LO-CHS and not CCHS. We report a case of LO-CHS with HD (LO-CHS / HD) who presented in respiratory failure at the age of five years.

KEY WORDS: central hypoventilation, children, hypothalamic dysfunction

INTRODUCTION

Congenital central hypoventilation syndrome (CCHS) is characterized by abnormal autonomic control of breathing that results in severe hypoventilation occurring initially during sleep. It was first described in children by Mellins *et al* in 1970^[1]. In most cases the onset of CCHS occurs in the neonatal period or during the early months of life^[2]. A form of LO-CHS has been described in the literature. Katz *et al*^[3] proposed that late onset central hypoventilation syndrome associated with hypothalamic dysfunction (LO-CHS/HD) is a distinct clinical syndrome. Both CCHS and LO-CHS have been associated with neural crest tumours and they generally occur in a histologically normal central nervous system (CNS). Both conditions have also been associated with PHOX2B gene mutation^[4]. HD has been frequently associated with LO-CHS but not CCHS. We report on a case of LO-CHS/HD presenting in a five year-old Kuwaiti girl.

CASE REPORT

This Kuwaiti girl was five years old when she was first admitted to our pediatric department in coma, with marked hypoxemia and respiratory failure. She was successfully resuscitated and transferred to ICU for mechanical ventilation. Initial blood gas showed acute on top of chronic respiratory acidosis.

She was born at term weighing 3.2 kg to healthy non- consanguineous parents. She had no neonatal problems. Her five sisters and three brothers are

alive and well. Child had normal growth and developmental milestones until the age of three years when her mother noticed that she became hyperphagic, eating almost all day with resultant rapid increase in weight (Fig. 1). She was seen by a pediatric endocrinologist who ruled out endocrinal causes of her obesity at that time.

Her mother also noticed that she was sleepier and she began to snore. Further history from the parents was suggestive of sleep disordered breathing. She had persistent snoring during sleep with frequent nocturnal arousal throughout the previous year. She had daytime hypersomnolence and depressed mood alternating at times with aggressive behaviour specifically in the past three months prior to her deterioration. The parents also reported recurrent unexplained fevers.

At the age of five years, following an upper respiratory tract infection while she was playing with other children at home she was found apnoeic and cyanosed. Mouth to mouth breathing was done and she was rushed to hospital where she was immediately intubated and mechanically ventilated for a week. She was notably obese with a weight of 40 kg (> 95th centile), and a height of 113 cm (75th centile) and her BMI was 31.5 kg/m² which was substantially above the 95th percentile for age. Otherwise her physical examination during that time was basically normal. Blood gas analysis showed pH 7.26, PaCO₂ 12.4 Kpa, PaO₂ 6.6 Kpa, and HCO₃ 40 meq/l. Apart from hyponatremia and low serum osmolality, her investigations showed normal serum potassium, urea, glucose,

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LO-CHS/HD typically have normal growth and development until 1.5 - 4 years of age after which they tend to have voracious appetite resulting in gross obesity. Respiratory failure with hypercarbia ensues. This may be precipitated by anesthesia or hypertrophy of tonsils and adenoids. Our patient came in respiratory failure at the age of five years, but she had polyphagia and obesity since she was three and her sleep disordered breathing was also noticed when she was four years old. Her symptoms improved only partially and temporarily when adenotonsillectomy was done.

Our patient was initially intubated and ventilated but following extubation she continued to show progressive hypoventilation and so was put on nocturnal nasal mask non-invasive ventilator that she could tolerate only for few weeks. She then had to undergo tracheostomy and was put on BiPAP machine. These sorts of ventilatory options are all well described in the literature^[9-11].

Using such options for home ventilation these children can have a good long term medical and psychosocial outcome^[12]. Nevertheless early diagnosis, appropriate management and diligent effort on the part of the parents remain of utmost importance in dealing with these children.

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