**Respiratory infection with hypercapnia – alert sign for a late-onset congenital central hypoventilation syndrome**

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**Introduction:** Congenital Central Hypoventilation Syndrome (CCHS) is a rare autonomic nervous system disorder. The characteristic abnormal ventilatory response to progressive hypercapnia and sustained hypoxia is usually identified in neonates. About 90% of individuals are heterozygous for a mutation in the exon 3 of the PHOX2B gene, in the 4p12 region. Currently, due to higher awareness to this entity and better diagnostic tools, cases are being identified in late childhood and even adulthood, often with mutations in other locations.

**Case report:** We present a 3 year old girl, healthy in the first months of her life, who had three admissions to an intensive care unit, at 9, 11 and 13 months of age, due of severe hypercapnic respiratory failure during viral respiratory infections. During hospitalization, a flutuation in arterial blood gases was noticed, with hypercapnia during sleep, and improvement when awake. There was no cardiac or digestive functional impairment. The CCHS hypothesis was confirmed genetically (PHOX2B NPARM mutation - heterozygosity in exon 1 - c.23dupA, p.Y8X). Hypoventilation was confirmed on the polysomnography (ETCO2 >50mmHg 80% in total sleep time – max. 63mmHg, min SpO2 64%). Currently, she is under non-invasive ventilation during sleep. She shows good physical growth and neurocognitive development. Her parents’ genetic study was normal.

**Comments:** A greater sensitivity is required to diagnose the less severe and / or late-onset CCHS cases. A respiratory infection may be the trigger and a significant difference between SpO2 and CO2 between sleep and awake states the warning signal. Given the clinical suspicion, genetic study should be undertaken. The rare mutation found in the present case, located in exon 1, may be correlated with the atypical presentation. Awareness for the disease is important because ventilatory support is essential to avoid hypoxia and severe hypercapnia that may impair survival, cardiovascular function and neurocognitive development. Early multidisciplinary intervention and rigorous monitoring are crucial to reduce morbidity and mortality.

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