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ACTA PÆDIATRICA NURTURING THE CHILD WILEY

READER'S FORUM

Applying diaphragm pacing in previously tracheostomised children with congenital central hypoventilation syndrome is a safe tool

To the Editor,

We thank Drs Alibrahim and Esquinas for the possibility to clarify some aspects of our strategy for applying DP in tracheotomised patients.[1,2]

As stated in our brief report, all patients who had tracheostomy were decannulated after DP implantation, and DP was applied as a ventilatory mode during sleep. The variation in the transition time from DP on tracheostomy to DP after decannulation was dependent on the assessment by the ear nose and throat (ENT) surgeon at the respective centres. When optimal settings were achieved by DP, decannulation was followed by careful monitoring including polygraphic sleep studies. Of note, patency of the airways, post-decannulation, could be assessed by primary closure of the tracheocutaneous fistula and tracheal inspection performed by an ENT surgeon. However, prior to decannulation, a pre-condition needed to be first evaluated by downsizing or capping the endotracheal tube while monitoring the ventilation during DP.

There has been a tendency to apply higher stimulation amplitudes in order to correct for variations in stimulation due to misplacement of the antenna from the receiver or due to positional impairment of gas exchange, with the risk of applying high negative pressures within the thoracic cavity and thereby risking obstruction of the upper airways. As previously described,[3] by applying higher frequency and lower stimulation amplitude in DP settings, we have minimised the mechanical risk for upper airway obstruction during DP, without compromising gas exchange. Additionally, by thorough monitoring of the patient in the home environment, by improved applications of the antenna with tailor-made bodices, and adjustments of the amplitude within preset ranges by personal assistants, we managed to further optimise the application of DP.

In terms of clinical evaluation, carbon dioxide monitoring or polygraphic sleep studies were performed to evaluate breathing pattern and ventilation both prior to and after DP surgery. One month after DP surgery, the threshold for the lowest DP stimulation for respectively the left and right phrenic nerve was determined, and the final stimulation amplitude was set 5%–10% above the threshold in order to achieve normal ventilation and oxygenation, in combination with approximately the same or slightly higher respiratory rate as compared to the period before DP was implanted.

There is a common consensus that the social environment and personal-care assistance are vital to ascertain an optimal ventilatory assistance. In Sweden, qualified staff financed by the healthcare system is available, thereby improving the quality of life for the patients. Nocturnal observation at home using pulse oximetry was recommended, while the presence of trained assistants or family members is necessary for avoiding complications such as airway obstruction or displacement of the antennas.

We thank again Drs Alibrahim and Esquinas for bringing attention to our work.

CONFLICT OF INTEREST

None.

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Response to letter: Diaphragm pacing in congenital central hypoventilation syndrome: A safe and final tool?

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