Evaluation of Overnight Oxygen Saturation and Transcutaneous Carbon Dioxide Monitoring (TOSCA) as a Screening Tool for Sleep Disordered Breathing

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Introduction: With a growing number of technology-dependent children and an increased demand to investigate for sleep disordered breathing (SDB), our centre invested in inpatient and outpatient oxygen saturation and transcutaneous carbon dioxide monitoring (TOSCA) machines to supplement our in-hospital polysomnography (PSG) service.

Aims: (1) To review the success rate of both inpatient and outpatient TOSCA studies. (2) To evaluate the need for further investigations after TOSCA studies.

Methods: We collected patient demographic data, indications for study and outcomes of the studies between December 2017 and November 2018. All studies were reported by a respiratory consultant who defined success based on the data quality and ability to answer the clinical question posed.

Results: A total of 128 studies in 98 patients (mean age 7 years) were performed. 111 (87%) of studies were deemed successful (outpatients 78%, inpatients 89%). Study indications were categorised by pathology groups: ear, nose and throat (ENT) (n=34); respiratory and cardiac (n=32) or neurological and neuromuscular (n=62). 27 (21%) studies were performed to monitor ventilation in children who were on non-invasive ventilation. 15 (11%) children were commenced on non-invasive ventilation based on their TOSCA result alone. Two were referred to ENT for surgical intervention. For 8 children the clinical question posed could not be answered with the TOSCA and a follow-up PSG was required.

Conclusion: Inpatient TOSCA studies were more successful than outpatient studies. We aim to improve home study success rates through utilisation of supporting ‘trouble-shooting’ video demonstrations. The TOSCA studies were effective as a screening tool but also, under certain conditions, can be used for monitoring children with SDB on non-invasive ventilation, ensuring more appropriate use of the PSG service.