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HEATED HUMIDIFIED HIGH FLOW NASAL CANNULA VERSUS CONTINUOUS POSITIVE AIRWAY PRESSURE THERAPY FOR OBSTRUCTIVE SLEEP APNOEA IN CHILDREN: THE PATIENTS' PERSPECTIVE

*Wong M[1], Taylor E[1], **Longland R[1]**, Leclerc M[1], Williams G[1], Neylan M[1], Kilner D[1], Chawla J[1]*

[1]Queensland Children's Hospital, South Brisbane, Australia

Introduction: Approximately 30% of otherwise healthy children will have residual obstructive sleep apnoea (OSA) after first line therapy with adenotonsillectomy (AT) with lower success rates in children with risk factors. Continuous positive airway pressure (CPAP) is often the next treatment option and, whilst highly effective therapy, can be challenging to sustain in children. A pilot study is underway at our centre to evaluate the efficacy of heated humidified high flow nasal cannula therapy (HFNC) compared to CPAP in children with residual OSA. A secondary aim of this study is to determine which therapy (HFNC versus CPAP) the patients prefer. This abstract will report preliminary findings.

Methods: Children under 18 years old identified as requiring a CPAP trial for residual OSA management were invited to undergo an additional polysomnography, where they underwent a trial of HFNC overnight, which was undertaken in a similar manner to the CPAP trial. Participants and caregivers completed a questionnaire regarding comfort level following both the HFNC and CPAP titration nights.

Results: 11 participants (4 males) between 4 months and 15 years old have completed the study to date. Using an 11-point Likert scale, the average reported comfort level grading for HFNC was 1.5 points higher than CPAP.

Discussion: This preliminary data suggests that on average caregivers and participants found HFNC more comfortable than CPAP. Alternative therapies such as HFNC may be effective in managing OSA and may be better tolerated in children non-adherent to CPAP.

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SLOW WAVE TRANSCRANIAL ELECTRICAL STIMULATION DURING WAKE TO INVESTIGATE THE CONSOLIDATION OF NEW LEARNING.

***Wood J[1]**, Bland N[1,2], Brownsett S[1,3], Sale M[1,4]*

[1]School of Health and Rehabilitation Sciences, Faculty of Health and Behavioural Sciences, The University Of Queensland, St Lucia, Australia, [2]School of Human Movement and Nutrition Sciences, Faculty of Health and Behavioural Sciences, The University of Queensland, St Lucia, Australia, [3]NHMRC Centre of Research Excellence in Aphasia Recovery and Rehabilitation (NHMRC CRE administered by La Trobe University, Australia, [4]Queensland Brain Institute, The University of Queensland, St Lucia, Australia

Introduction: Slow, oscillatory, transcranial electrical stimulation (so-tES) applies a current over the scalp that oscillates in intensity at a frequency associated with slow wave sleep (SWS; 0.75Hz). When applied during SWS, so-tES can enhance SWS EEG power compared to sham stimulation, as well as overnight declarative memory consolidation. When applied during wake, so-tES can enhance local EEG power in the slow wave frequency range (0.5–4.5Hz) compared to sham. Therefore, this study will investigate whether so-tES can enhance the early consolidation of new learning compared to sham, when applied during wake. A preliminary analysis of data will be presented.

Methods: Healthy, young, right-handed adults (18–35 years) practiced a motor sequence learning task for 30 minutes, before receiving 15 minutes of active or sham so-tES (0.75Hz) during quiet wakefulness. Task performance was assessed by recording the total number of correct sequences performed in 30 seconds before practice, after practice, and after stimulation. Performance improvements will be compared between stimulation conditions. Non-invasive, electrophysiological corticospinal excitability measurements (i.e., motor-evoked potentials) were also recorded at six timepoints throughout each session, to investigate whether active so-tES can modulate corticospinal excitability differently to sham.

Progress to date

Data collection is ongoing, and completion is expected by late 2021.

Intended outcome and impact

We expect so-tES to enhance early skill consolidation during wake, and that enhanced consolidation will be associated with less variable measurements of corticospinal excitability, when compared with sham stimulation.

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BACK TO SCHOOL - SUPPORTING INVASIVELY VENTILATED CHILDREN TO RETURN TO THE CLASSROOM

***Wood C[1]**, Waters K[1,2], Gray K[2,3]*

[1]The Children's Hospital At Westmead, Westmead, Sydney, Australia, [2]Faculty of Medicine, Child and Adolescent Health, The university of Sydney, Sydney, Australia, [3]Faculty of Medicine, Health and Human Sciences, Macquarie University, Sydney, Australia

Introduction: Integration of children with high health needs into the education system, such as those who are invasively ventilated, requires careful planning.

Methods: We retrospectively reviewed data bases and medical records from January 2004 until December 2020 to profile school age children who, following insertion of a tracheostomy to facilitate invasive ventilation, required assistance in entering or returning to the education system.

Results: 44 children received invasive respiratory support. Five (11%) remain under the legal school age of 6 years. Fourteen (32%) children entered main stream education – Private or state schools. Three (7%) children attended main stream schools with extra assistance in a support unit. Eighteen (41%) children attended Special Schools that met their individual underlying health care needs. Four (9%) children received either home schooling or attended hospital school. All children received appropriate education according to cognitive ability and none were placed in an inappropriate school setting due to their need for extra support with respiratory health.

Discussion: High use of health technologies can be perceived as a barrier to the normal classroom so negotiation with education authorities should be part of the patient journey. Support for (re-) integration to the school system includes recruitment and training of support staff and appropriate assessments of ability to provide a safe environment whilst maintaining appropriate level of supervision. Collaboration between the hospital and the education facility is key to the successful integration of children into the education system.