were initial studies and 11 were repeat studies. Age at the time of sleep study ranged from 11 days to 19 years old. 8 (15%) subjects were less than 1 years old and 44 (84%) were 1 year and older. For subjects less than one year old, mean sleep onset latency (min) was 21±33.4, REM onset latency (min) 35±27.2, SWS(%) 43.3±10.2, REM(%) 35.3±7.35, arousal index 9.7±11.9, wake after sleep onset (WASO) (min) 59.5±11.4 and sleep efficiency 82.4±9.4. For the 1-19 year age group, mean sleep onset latency (min) was 24.5±23.1, REM onset latency (min) 104± 59.9, SWS (%) 21.4±7.11, REM (%) 21.3±6.9, arousal index 7.3±5.4, WASO (min) 46.5±36.10 and sleep efficiency was 85.7±9.0.

Conclusion: In our population of PWS patients, REM onset latency was not decreased as shown in previous studies. Sleep efficiency was decreased. Other sleep parameters fell within normal range. Additional data on signs of excessive daytime sleepiness and sleep disordered breathing in this population is needed to understand if EDS persists with decreased sleep efficiency and otherwise normal sleep parameters and/or with OSA.

Support (If Any):

0533

AGE-RELATED CHANGES IN SLEEP DISORDERED BREATHING IN PEDIATRIC PRADER WILLI SYNDROME PATIENTS

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Introduction: Prader Willi Syndrome (PWS) is a rare genetic disorder characterized by infantile hypotonia, hyperphagia leading to early childhood obesity, and multiple sleep abnormalities including increased risk of obstructive sleep apnea, central sleep apnea, and excessive daytime sleepiness. PWS patients have been reported to have a shorter lifespan with respiratory related causes as a common cause of death. Limited data exists on PSGs in pediatric PWS patients. Our aim was to compare respiratory parameters in different age groups.

Methods: We conducted a retrospective chart review of pediatric patients with a genetically confirmed diagnosis of Prader Willi Syndrome from 2007 to 2015. In lab polysomnograms were scored using the AASM criteria for pediatric sleep studies. As central apneas are more commonly seen in infancy with PWS, we categorized patients into < 1 years old and 1-19 years old for comparison.

Results: Fifty-one PSGs were reviewed of which 31 (60.7%) were males and 20 (39.3%) were females. Forty-one PSGs were initial studies and 11 were repeat studies. Age at time of sleep study ranged from 11 days-19 years old. 8 (15%) subjects were < 1 years old and 44 (84%) were 1-19 years old. For patients < 1 year old, mean obstructive hypopnea index (OAHI) was 5.65±3.7, central index (CI)2.2±2.5, mean SpO2(%) 98±.4, SpO2 nadir 86±5.8, and % of time with SpO2 < 90% .16±.314. For patients 1-19 years old, mean (OAHI) was 8.7±13.4, (CI) 0.8±1.25, mean SpO2 96±3.0, SpO2 nadir 81±.10, and % of time with SpO2 < 90% .03±.10. The OAHI trended up in the 1-19 year old group but results were not significant, CI decreased in the 1-19 year old group 2.2 vs 0.8 p < .04.

Conclusion: Our study demonstrated similar results to prior studies in pediatric PWS with an increase in OAHI and decrease in CI with age. SPO2 nadir decreased in the 1-19 year old group but these results were not significant. Ongoing research at our center is looking at possible contributing factors including BMI percentile, GH therapy, and adenotonsillectomy to better understand our findings.

Support (If Any):

0534

DYSPHAGIA SEVERITY IS ASSOCIATED WITH WORSE SLEEP DISORDERED BREATHING IN INFANTS WITH TRISOMY 21

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Introduction: Hypotonia is common in infants with Trisomy 21. This can cause masticatory and oropharyngeal muscle weakness increasing the risk for dysphagia and sleep disordered breathing. Data describing the occurrence of dysphagia and sleep disordered breathing in infants with Trisomy 21 is limited. This study aims to determine the frequency and severity of dysphagia and its relationship to polysomnogram parameters in infants with Trisomy 21.

Methods: Retrospective chart review of patients with Trisomy 21 <12 months old that underwent polysomnography at Seattle Children's Hospital between October 1, 2015-August 23, 2021. Data collected included: sex, age, presence of dysphagia, recommended thickener type and polysomnographic data.

Results: A total of 526 polysomnograms in patients with Trisomy 21 were performed. Forty-one studies were identified in <12 months old. Results in mean ± SD showed: age 6.5 months + 3, 66% were male and 73% were diagnosed with dysphagia through a video fluoroscopic swallow study. In those with dysphagia, 16% can tolerate thin liquids, 20% prescribed nectar-thick, 7% prescribed honey-thick and 57% were G-tube dependent. In patients with dysphagia compared to those without dysphagia: there was higher total AHI of 43.3 +/- 35.3 vs. 22.6 +/- 10.6 (p=0.006), oAHI of 39.7 +/- 35.5 vs. 17.2 +/- 11.6 (p=0.004), CAI of 3.4 +/- 3.4 vs. 3.4 +/- 1.8 (p=0.11), oxygen saturation nadir of 78.6 +/- 10.6 vs. 83.1 +/- 6.6 (p=0.11) and percentage total sleep time TcCO2 >50 mmHg of 44.6 +/- 42.6 vs. 31 +/- 40.3 (p=0.44). Worse dysphagia was positively correlated with a higher oAHI (r=0.38, p=0.03).

Conclusion: There is a high incidence of dysphagia and sleep disordered breathing in infants with Trisomy 21. Dysphagia severity correlated with oAHI severity. Dysphagia in OSA can be due to the sensory and motor changes of the pharynx with impaired swallow-breathing mechanism. Chronic microaspiration can also result in decreased pulmonary reserve from lower airway inflammation or lung parenchymal disease, which may lead to worse sleep disordered breathing. Current guidelines suggest screening at school age or when there are clinical symptoms of OSA in Trisomy 21. However, results suggest the need to evaluate and intervene earlier especially in infants with dysphagia.

Support (If Any):

0535

PREVALENCE OF VARIOUS FORMS OF SLEEP DISORDERED BREATHING IN INFANTS WITH DOWN SYNDROME.

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Introduction: Children with Down Syndrome (DS) are at high risk of sleep disordered breathing (SDB). Undiagnosed SDB in

younger children may confer further risks of cardiovascular and neurocognitive complications associated with DS. However, there is paucity of studies examining SDB in infants with DS. The purpose of the study was to examine the prevalence of obstructive sleep apnea (OSA), sleep hypoventilation (SH) and hypoxemia in infants with DS.

Methods: Infants (≤12 months old) with DS who underwent first polysomnography (PSG) at Seattle Children's hospital over a 6-year period were included. Data collected included obstructive apnea hypopnea index (oAHI), central apnea hypopnea index (CAHI), time spent with CO2 levels > 50 mmHg, time (minutes) spent with saturations <88% (T88), and saturation nadir (minO2sat). Exclusion criteria: follow up studies, and studies post procedures. Data presented by descriptive statistics and comparison by unpaired t-test.

Results: A total of 526 children with DS underwent PSG during the collection time. Forty two fit criteria (Mean age 6.6 months, male 66%). Diagnostic (n=13), split to oxygen (n=29, 69%). Split studies were more severe when compared with full diagnostic AHI (Mean 44.7 vs. 14.8, p=0.0007), T88 (Mean 12.5 vs. 0.2 p=0.03) and minO2sat (77.6 vs. 85.8%, p=0.01). Overall mean oAHI was 33.7 (S.D. 30) CAI was 3.4 (S.D. 3.1). 5/31 with reliable capnography had SH (16.1%) with no difference in age vs. the non-SH group (6.0 [3.2] vs. 6.6 [3.1], p>0.05). Overall, oAHI was more severe in infants with hypoventilation (58.9 [23.6] vs. 29.3 [63],p>0.05). Ten infants spent >5 min with saturations <88% (21.4%). All infants with hypoxemia had OSA (oAHI Mean 66.5 SD 40). Infants with OSA and hypoxemia had worse oAHI than those without hypoxemia (p<0.05).

Conclusion: Our data shows that a large percent of infants with DS (69%) required a split study due to severe OSA (mean oAHI 66.5) or hypoxemia (21.4%). The overall mean AHI for this age group was 33.7. Hypoventilation was present in 16.1%. This study highlights the high prevalence of SDB in infants with DS and supports early PSG assessment in this patient population.

Support (If Any):

0536

ASSOCIATION OF A NOVEL EEG BIOMARKER OF SLEEP DEPTH WITH SLEEP DISORDERED BREATHING IN ADOLESCENTS

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Introduction: The odds ratio product (ORP) provides a standardized, continuous measure of sleep depth that ranges from 0 (deep sleep) to 2.5 (full wakefulness). ORP has been shown to increase during adolescence, representing the decline in sleep depth that occurs during this developmental period. In adults, higher ORP has been associated with sleep disordered breathing (SDB), including obstructive sleep apnea (OSA), while there have been no studies in youth. We aimed to determine the association of ORP with SDB in adolescents.

Methods: We extracted ORP from the sleep EEG of 261 typically developing adolescents aged 12-23y (median 16y) from the Penn State Child Cohort. Higher ORP during rapid eye movement (REM) and non-REM sleep indicates less deep sleep, while higher ORP-9 (i.e., average ORP in the 9-seconds following non-REM cortical arousals) indicates greater arousability. We used general linear models, adjusted for sex, age and race/ethnicity, to examine mean differences in ORP metrics among clinically meaningful groups of SDB based on the apnea/hypopnea index (AHI) consisting of no SDB (AHI<2 and no snoring, n=100), primary snoring (AHI<2 and snoring, n=75), 2≤AHI<5 (n=64), and AHI≥5 (n=22).

Results: Adolescents with primary snoring or 2≤AHI<5 did not significantly differ in ORP metrics from those without SDB (all p≥0.12). Adolescents with AHI≥5 had higher ORP-NREM compared to those without SDB, with primary snoring or with 2≤AHI<5 (all p≤0.01), while ORP-REM was significantly higher compared to those without SDB (p=0.02). ORP-9 was significantly greater in adolescents with AHI≥5 compared to those with no SDB (p<0.01) and those with primary snoring (p=0.02), but not when compared to those with 2≤AHI<5 (p=0.07).

Conclusion: Our data suggest that adolescents with OSA experience lower REM and non-REM sleep depth/intensity (higher ORP) compared to those without SDB. In addition, these adolescents experience a slower progression back to deep sleep following cortical arousals (higher ORP-9), which suggests they remain in a high arousability state and, thus, are more likely to repeat arousals. Commensurate with previous studies in adults, our data show that ORP is a useful sleep EEG biomarker able to capture decreased sleep depth in adolescents with OSA.

Support (If Any): National Institutes of Health (R01MH118308, UL1TR000127)

0537

SYMPTOM IMPROVEMENT REPORTED WITH SOME PAP USE IN NON-ADHERENT PEDIATRIC PATIENTS WITH OSA

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Introduction: Positive airway pressure (PAP) is commonly used in children to treat obstructive sleep apnea (OSA) when surgery is not an option or is ineffective1-3, but adherence is often poor. Observational studies suggest utilization of PAP improves symptoms, signs, and polysomnogram indices of OSA in at least 85% of children4-9. The Agency for Healthcare Research and Quality released the report "Continuous Positive Airway Pressure Treatment for Obstructive Sleep Apnea"10. Conclusions of this report determined that the published evidence reviewed does not support that PAP affects long term outcomes. No pediatric studies were included in this report. Objectives of this study were to determine if pediatric patients with OSA who are non-adherent to PAP therapy report an improvement in symptoms with some use of PAP.

Methods: A retrospective chart review was performed on patients with OSA on PAP seen in the pediatric sleep clinic. Patients were considered adherent to PAP if usage was longer than 4 hours/night for 70% of nights or more. Follow up visits occurred around 3 months, 6 months, 1 year, and 18 months-2 years. Adherence data and reported improvement in symptoms were documented at each visit, and demographical information was obtained.

Results: 235 patients were included in the analysis (63.9% male, 32.3% female, 3.8% missing), with a mean age (SD) at PAP initiation of 12 years (4.5). The sample was predominately Caucasian (51.5%) or African American (38.3%), 85.9% were non-Hispanic, and 53.2% obese. The mean (SD) apnea-hypopnea index was 24.7(27.6)/hr. At first visit post-initiation, of the 138 patients that had adherence data available, 80.4% reported improvement in symptoms with PAP use. Of these patients, 55.86% were non-adherent but reported symptom improvement with some use of PAP. Visit 4 data was available for 74 patients. At visit 4, 91.9% reported improvement in symptoms. Of these, 48.53% were considered non-adherent but reported symptom improvement with some use of PAP.