Polysomnogram characteristics and treatment modalities for OSA in a referred population of young children with Down Syndrome

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Introduction

- Children with Down syndrome(DS) are at high risk for Obstructive sleep apnea hypopnea syndrome(OSAS)
- Untreated OSAS can have negative metabolic, cardiovascular, neurological, cognitive and behavioral consequences
- Current guidelines recommend screening polysomnogram (PSG) in children with DS by the age of 4 yr
- Both surgical and non-surgical treatment options exist to treat OSAS
- Adenoidectomy and Tonsillectomy(AT) is the first line treatment modality for OSAS in children

Objectives

- Describe the clinical characteristics and PSG data of young children with DS(≤ 60 months)
- Most common treatment modalities utilized to treat their OSAS

Methods

- IRB-approved retrospective chart review of baseline PSGs of infants and toddlers with DS performed between 2015 and 2020
- Age ≤ 60 months at the time of baseline PSG
- **Information Collected: D**emographic, polysomnographic, treatment information & relevant medical history
- All information was collected from regular health appointment summaries or PSG reports in the Nemours electronic medical record.

Analysis:

- Descriptive statistics were calculated as appropriate
- Wilcoxon's rank sum test was run to compare the two cohorts
- **Cohorts:**
  - Younger Cohort: 0 - 36 Months (n = 35)
  - Older Cohort: 37- 60 Months (n = 29)

Results

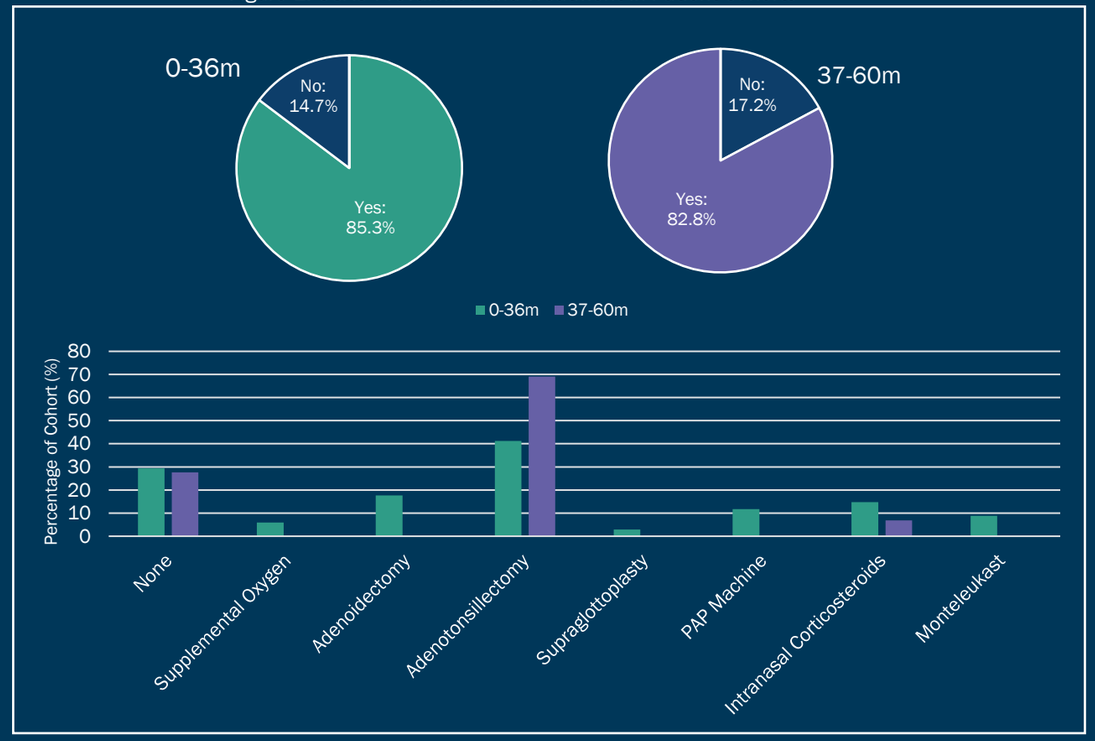
Table 1: Demographic Information

	Sex	Race	Ethnicity
0-36m	Male: 48.6% Female: 51.4%	White: 58.8% Black: 20.6% Asian: 0% Other: 17.6%	Hispanic/Latino: 8.6% Not H/L: 77.1% Other H/L: 11.4%
37-60m	Male: 41.4% Female: 58.6%	White: 65.5% Black: 6.9% Asian: 0% Other: 27.6%	Hispanic/Latino: 20.7% Not H/L: 65.5% Other H/L: 13.8%

Table 2: Sleep Parameters

Mean (SD)	0-36m	37-60m	P-Value
TST (min)	395 (67.7)	409 (60.9)	0.29
Sleep Efficiency (%)	82.4 (9.07)	84.6 (9.12)	0.31
AHI (#/hr)	24.2 (23.2)	18.1 (12)	0.62
CAI (#/hr)	2.2 (1.5)	3.7 (2.0)	0.45
OAI (#/hr)	4.1 (1.5)	2.3 (3.4)	0.15
HI (#/hr)	17.8 (20.2)	12.1 (9.6)	0.51
TST w/spO2 <= 90% (%)	3.4 (9.7)	0.3 (0.8)	0.13
spO2 Nadir (%)	84.5 (9.2)	88.2 (5.1)	0.12
Peak etCO2 (torr)	55.5 (5.3)	56.3 (8.2)	0.73
TST w/etCO2 > 50 torr (%)	19.7(30.5)	22.1 (28.6)	0.64
Arousal Index	34 (20.8)	29.7 (13.1)	0.58

Figure 1: OSAS Prevalence and Treatment in Patient Cohorts



Conclusions

- OSAS was present in 85.3% of children in the 0-36 m and 82.8% of children in 37-60m
- Both cohorts experienced high rates of OSA with high AHIs (21.4 events/hr) and trend towards hypoventilation
- AT was the most common treatment modality utilized by both groups
- Children 0-36 m received a greater variety of treatment modalities
- Findings point to the need for increased suspicion of OSA in younger patients with DS

Limitations and Future Research

- Cohort was drawn from a large pediatric referral center and may represent patients with greater medical complexity and access to medical care
- Population-based study of infants and young children with Down Syndrome to reinvestigate current OSAS evaluation guidelines
- Data from a larger cohort and multiple centers to increase the generalizability of the conclusions

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