Prevalence of obstructive sleep apnoea in young children with Down syndrome

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Introduction
• Down Syndrome (DS) affects between 1/650 and 1/1000 live births worldwide.
• It is the leading genetic cause of intellectual disability in childhood.
• Children with DS are at high risk of obstructive sleep apnoea (OSA) due to macroglossia, mid-facial hypoplasia and obesity.
• Importantly, they may have increased risk of cognitive, behavioural and cardiovascular consequences of OSA due to limited cognitive reserve and underlying cardiac problems.
• Prevalence rates of OSA between 54% to over 90% have been reported, in contrast to 1–4% in otherwise healthy, typically developing children.
• Small samples, selection bias, retrospective reports and use of non-standard scoring and diagnostic criteria limit interpretation of prior studies.

Aims
• To determine the prevalence of OSA in young children with DS.
• To establish a cohort for future follow-up.

Methods
• Children with DS aged 6 months to 6th birthday were recruited from community clinics, hospital registers and parent support groups.
• Exclusion criteria included use of home oxygen, CPAP/BiPAP or cardio-respiratory screening in the preceding 3 months.
• Children attended one of 3 participating research centres.
• Measures included height, weight and socio-demographic data.
• Parents were trained to set up a cardiorespiratory device (Somnotouch, Somnomedics, Germany) at home unless they expressed a preference for sleep laboratory assessment.
• Measures included chest and abdominal RIP, nasal pressure flow, toe pulse oximetry, actigraphy, body position and snore sensor.
• Studies recording ≥ 4 hrs of sleep were scored by an experienced sleep technologist using AASM (2012) rules.
• Parents were contacted 3 months after their child’s study to feedback on their experience of domiciliary monitoring.

Results
Here we report preliminary data on the first 94 of an anticipated 180 children recruited.

Demographics
• Mean age is 39.5 months (SD 21.5) with more male participants (n = 55).
• 69% have a congenital cardiac disease; 34% are on prophylactic treatment for asthma & 27% have allergic rhinitis; 27% had a history of laryngomalacia and 3% have epilepsy.
• 14 children had a history of tonsillectomy on average 18.8 months earlier. These children were significantly older, mean age 54.5 months.

Acceptability of domiciliary studies
• 92/94 parents opted for domiciliary studies. Of these, 11 studies did not meet quality standards: 6/7 were successfully repeated at home and 3/4 as attended studies in hospital.
• The overall success rate for domiciliary studies (7% repeats) was 93%.
• Of 48 parents interviewed after 3 months, 34 reported domiciliary set up easy or OK and 14 as difficult.
• Despite this, 45 would repeat the study at home if needed, 2 were unsure and 1 would choose a study in hospital.

Prevalence of OSA
• OAHI demonstrated a skewed distribution with the majority (53%) of children having mild OSA. (OAHI>1<5/hr) illustrated in Figure 2.
• Different thresholds for a diagnosis of OSA have been used in recently published data. Figure 3 illustrates number of cases of OSA for each.

Discussion
• We believe this to be the largest reported study of OSA in very young children with DS and the first to use unattended domiciliary cardiorespiratory monitoring.
• Consistent with previous studies we report a high rate of OSA ranging from 16 -70%, depending on the diagnostic threshold used.
• Importantly there was no association with age suggesting that clinicians should screen children for OSA from infancy.

References
3 The Preschool Obstructive Sleep Apnoea Tonsillectomy, Adenoidectomy child study ACTRN12611000021976

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