Retrospective review of central event indices in children with repaired cleft palate

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BACKGROUND:

Cleft palate is a midline problem, presenting as an isolated cleft or part of an underlying syndrome. As a regional cleft centre, we perform large numbers of sleep studies in this population. Anecdotal observations suggest that central apnoeas/hypopnoeas appear more prevalent in this group, even after cleft palate repair. This study compares central event frequency in children with repaired cleft palate and age/gender-matched controls.

METHODS:

A retrospective review (2010-2015) of attended in-patient cardio-respiratory sleep studies in children aged ≥1years with repaired cleft palate was conducted. Cases were matched for age and gender with the nearest routine non-cleft patient. Studies measuring airflow and respiratory effort, allowing delineation of central versus obstructive events, were manually scored by registered Clinical Physiologists. Standard statistical analyses were undertaken (IBM SPSS Statistics v21.0; significance level $p<0.05$).

RESULTS:

Participant characteristics are summarised in Table 1. Fifty-two matched pairs were included. Groups did not differ significantly in age (1.6-17.0 years) or gender (70 males, 34 females). No significant differences were observed in the number of central events per hour in bed (CEI), or their mean/maximum duration. However, the index of obstructive events per hour in bed (OEI; $p<0.001$) and overall number of apnoeas/hypopnoeas per hour in bed (AH; $p=0.01$) were lower in the cleft group. SpO_2 nadir was lower in controls ($p=0.04$). CEI reduced with age in both groups (cleft $\rho=-0.41$, $p=0.03$; control $\rho=-0.38$, $p=0.01$). OEI (cleft $\rho=-0.37$, $p=0.01$; control $\rho=-0.31$, $p=0.02$) and AH (cleft $\rho=-0.55$, $p<0.001$; control $\rho=-0.44$, $p=0.001$) were also significantly negatively correlated with age in both groups. SpO_2 nadir was correlated with age (cleft $r=0.47$, $p=<0.001$; control $r=0.45$ $p=0.001$) across both groups.

DISCUSSION:

In this preliminary review of central apnoea/hypopnoea in children with repaired cleft palate, frequency and severity of central events did not differ significantly from age/gender-matched controls. The study is ongoing.

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Table 1: Anthropometric and polygrapic characteristics of participants by group. Parametric variables* were analysed using independent samples t-test and chi-square test. Non-parametric variables were tested using Mann-Whitney U test. Results presented as mean±SD or median(IQR) as appropriate, unless otherwise stated.**

	Cleft n=52	**Control n=52**	**p**
Gender	35 males : 17 females	35 males : 17 females	0.58
Age (years) *	6.4±3.2	6.5±3.3	0.87
1-4 years (n)	*11*	*11*	*0.996*
4-8 years (n)	*28*	*27*	
8-12 years (n)	*10*	*11*	
12+ years (n)	*3*	*3*	
Time in bed (min) *	530.4±68.4	560.2±59.8	0.02
AH per hour in bed **	0 (0-1)	1 (0-3)	0.01
Obstructive events per hour in bed **	0 (0-0)	0 (0-3)	<0.001
*Mean duration (s) **	*9.1±1.8*	*10.4±2.1*	*0.06*
*Maximum duration (s) **	*11.6±5.2*	*15.4±7.1*	*0.09*
Central events per hour in bed **	0 (0-1)	0 (0-0)	0.32
*Mean duration (s) **	*8.3±2.5*	*8.1±1.5*	*0.75*
*Maximum duration (s) **	*10.2±3.7*	*10.4±2.4*	*0.80*
SpO2 nadir (%) *	91.1±3.5	89.4±4.5	0.04