Lung Sickness in Murri Kids: a cohort study in urban Indigenous children

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Background

- Acute respiratory illnesses (ARI) with cough as a symptom are predominant causes of morbidity in Australian Indigenous children.
- With the exception of ear disease, there are limited studies that have addressed burden and outcome. Further, none of the existing studies relate to Indigenous children living in urban areas.
- Here we present our study design and the results of the first 66 children enrolled in the first study that comprehensively examines the incidence, aetiology, risk factors for and outcomes of ARI in this population.

Primary objectives

- To determine the incidence of ARI over a 2 year period amongst urban Indigenous children.
- To determine the incidence of chronic cough (> 4weeks duration) following ARI among urban Indigenous children

Secondary objectives

- To examine the social, cultural, environmental, microbiological and clinical predictors of ARI and its outcomes in urban Indigenous children
- To describe the direct and indirect costs of ARI and ARI outcomes in urban Indigenous children

Study design

- Cohort study of Indigenous children aged < 5 years registered with an urban Indigenous primary health care Service (Murri Health Group, Caboolture, Queensland)
  - children followed monthly for 12 months from enrolment
  - if ARI develops, children followed weekly for 4 weeks and reviewed by respiratory physician if cough persists for >28 days
- Overseen by an Indigenous Research Reference Group
- All recruitment & data collection performed by Indigenous researchers

Eligibility criteria

- Age < 5 years and identified as Indigenous by parent/guardian.
- Registered as client of the primary health service and not planning to move from study area

Data collection

- Clinical, epidemiological, social, economic, environmental, microbiological data collected at baseline
- Monthly follow-up to collect ARI events and changes in child characteristics over time
- At ARI onset, weekly follow-up is initiated including weekly nasal swabs and parent completed cough diary cards

This painting, produced for the TLSiMkids Study portrays the sea turtle. Turtles need strong lungs to survive throughout life

Artist: Indala (2012)

Study endpoints

Primary: Acute respiratory illness with cough as a symptom

Co-primary: Chronic cough, defined as persistent cough for 28 days with no more than a 3 day break in cough

Laboratory Data

- Bilateral anterior nasal swabs collected at baseline and during ARI events

Bacteriology

- PCR testing for *M. pneumoniae, S. pneumoniae*, non-typable *Haemophilis influenza* (NTHi), *M. catarrhalis, S. aureus C. trachomatis, C pneumoniae* and *S. negevensis*

Virology

- PCR testing for human rhinviruses, adenovirus, influenza vairus (A & B), parainfluenza virus 1 - 3, respiratory syncytial virus, human metapneumonovirus, bocavirus, coronaviruses (OC43, 229E,NL63 + HKU1) and polyomaviruses KI and WU

Table 1. Selected baseline characteristics of first 66 children enrolled

		N=66		
Gender:	Male	30	45.4%	
	Female	36	54.6%	
Median age (months)			17.8 (IQR 8.2-30.7)	
Indigenous Status of child:	Aboriginal	60	91%	
	Torres Strait Islander	4	6%	
	Both Aboriginal and Torres Strait Islander	2	3%	
Cultural factors				
Cultural connections maintained at home		41	65.2%	
Identify with Mob/Tribe/Nation		43	65.2%	
Family members of stolen generation		29	42.4%	
Breastfeeding history				**95%CI**
Currently breastfed		8	12.3%	4% - 20%
Never breastfed		17	25%	14% - 36%
Ever breastfed		47	73%	62% - 84%
Birth Information				**95%CI**
Mean birth weight in grams			2473.2	2123 - 2823
Mean Gestational age weeks			38.6	38 - 39
Mean Maternal age at birth of child			26.0	25 - 28
Mean Paternal age at birth of child			31.5	28 - 35
Maternal smoking during pregnancy		33	50%	38% - 63%
Maternal alcohol consumption during pregnancy		14	22%	11% - 32%
Maternal alcohol consumption in 3—6 months before pregnancy		35	53%	40% - 65%
Environmental Factors				**95%CI**
Child Care attendance		18	27%	16% - 38%
Indoor smoke exposure		2	3.5%	2% - 8%
Outdoor smoke exposure		48	75%	63% - 86%
Care type at home: both parents		35	53%	40% - 65%
	single parents	25	37%	26% - 50%
	other carer	6	10%	3.5% - 18%
Crowding Indicator				**95%CI**
Average number of people sleeping in same room as child			1.49	1.22 - 1.76
Average number of children usually living in house			1.84	1.5 - 2.18
Respiratory history				**95%CI**
Wheeze in past 12 months		11	16%	8.6% - 27%
History chronic cough in past 12 months		15	15%	10% - 20%
Hospitalisation of ARI past 12 months		9	16%	8.6% - 27%
Immunisation status				**95%CI**
Flu vaccine in previous 12 months		4	6%	1.6% - 14%
Pneumococcal vaccine ever given		35	85%	75% - 93%
Symptoms suggestive of Obstructive Sleep Apnoea				**95%CI**
Choking/gasping sounds while asleep		14	21%	12% - 33%
Frequent colds		28	44%	31% - 56%
Mouth breathing because of a blocked nose		27	42%	29% - 55%
Snoring		31	48%	35% - 61%
Pauses in breathing at night		10	15%	8% - 26%
Excessive daytime sleepiness		29	45%	32% - 58%

Table 2. ARI events recorded to date (n = 66 children)

Child-weeks of follow up		1189
Total ARI reported in cohort		67
ARI/per 100 child-weeks		5.7 (95%CI 4.4 - 7.1)
Cough at ARI onset:	**Dry**	35%
	Wet	40%
	Variable	15%
	None	10%
Persistent cough at day 28:	**Yes**	20%
	No	73%
	Unknown	7%
Cough type at day 28:	**Dry**	31%
	Wet	54%
	Variable	15%

Conclusion

- This is the first study to comprehensively describe the incidence, predictors and outcomes of ARI in urban Indigenous children.
- The proportion of children developing chronic cough post ARI is higher than that currently reported in the literature[1]
- Challenges faced during the recruiting and follow up have included:
  - Transience of children and carers
  - Limited access to communication resources e.g. internet ,email,
- The study will provide data that informs prevention and management of ARI in this population

References

1. Hay AD, Wilson AD. Br J Gen Pract. 2002; 52: 401 - 409

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