Otitis Media in Indigenous Children: A cross sectional study of remote and urban communities

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Outline

- Background
- Aims
- The project
- Results
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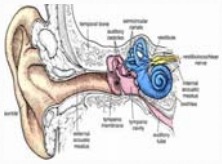
- Future direction



Background

- Australian Indigenous children have high rates of otitis media
  - 30% of remote Indigenous children have some form of ear disease[1]
- Otitis media is responsible for the majority of hearing problems in Indigenous children [2]
- Deterministic thinking attributed high rates of ear disease in Indigenous people to anatomical or immunological differences [3, 4]

Background

- Poor physical environment and socio-economic factors are thought to be critical influences in the development of otitis media, irrespective of ethnicity [5-10]
- Limited research of Indigenous children living across different environments
- Very limited evidence regarding otitis media in urban Indigenous children

Aims

- Do Indigenous children in urban environments have similarly high rates of otitis media compared to rural Indigenous children?
- Do urban Indigenous children also experience severe otitis media?

Perforated tympanic membrane

- Is exposure to risk factors similar between rural and urban communities?

Methods

- Cross sectional study comparing data collected from Medicare funded Indigenous Child Health Checks (aged 0-14 years – Medicare item number 715)
  - Urban location → Inala Indigenous Health (n=462)
  - Rural location → Northern Territory Emergency Response Child Health Checks Prescribed Area (n=9373)
- Recruitment March 2007 – March 2010
- Ethics approval was given by the University of Queensland with support from local Inala Indigenous Elders Incorporated

Results

Table 1

Demographic Data

	Inala n (%)	Northern Territory n (%)
Age (years)		
0-5	227 (49.2)	4170 (44.5)
6-11	171 (37.1)	3724 (39.7)
12-15	63 (13.7)	1479 (15.8)
Sex		
Female	207 (53.5)	4531 (48.3)
Male	247 (44.8)	4805 (51.3)

Results

Table 2

Comparison of Tympanic Membrane: Inala versus Northern Territory[a]

	Inala (n=462) All ages n (%)	NT (n=9373) All ages n (%)	RR	95% CI	P value
Variable					
Appearance of tympanic membrane					
Abnormal	75 (16.2)	2811 (30)	1.85	1.50, 2.28	<0.001
Dry Perforation	5 (1.1)	614 (19.4)[b]	17.93	7.48, 42.98	<0.001

[a] all analysis conducted using chi-squared analysis

Results

Table 3

Comparison Risk Factor Exposure: Inala versus Northern Territory [a]

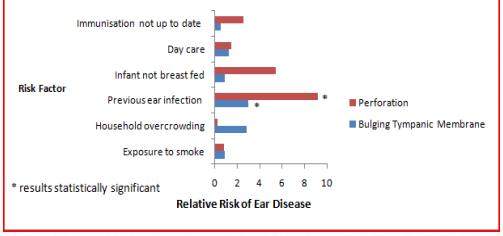
	Inala (n=462) All ages n(%)	NT (n=9373) All ages n(%)	χ^2	RR	95% CI	P value
Variable						
Exposure to known risk factors						
Exposure to Smoke [b]	340 (73.6)	7209 (76.9)	2.72	1.05	0.99, 1.11	0.099
Immunisation not up to date	92 (19.2)	1444 (15.4)	6.79	0.77	0.64, 0.94	0.009

[a] all analysis conducted using chi-squared analysis

[b] Exposure to smoke = either parental smoking or subject smokes

Results

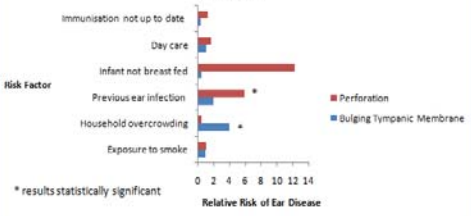
Figure 1 - Relationship of ear disease and exposure to risk factor in Inala (all ages)



* results statistically significant

Results

Figure 2 - Relationship of ear disease and exposure to risk factor in Inala (0-5 years)



* results statistically significant

Take Home Message

- Urban Indigenous children have lower rates of otitis media and less severe disease
- The same risk factors predict otitis media in both urban and rural locations
- Attention to environmental risk factors is critical to reduce rates of otitis media
  - Household overcrowding
  - Risk factor modification of children with previous ear infection
- Readily modifiable risk factors may be particularly important
  - Exposure to smoke
  - Breastfeeding
- Target age group 0-5 years

Limitations of Data

- Data collection
  - Convenience sample
  - Selection bias
  - One urban setting - small numbers
  - Clinic based – missing data
- Measured variables
  - Retrospective → recall bias
  - Potentially sensitive information → under reporting
  - Difficulties in defining variables
- Limited availability of data from the Northern Territory for comparison
- Other risk factors that weren't considered
- Ideal study - Large community or population based study in multiple sites with the primary objective of comparing urban and rural rates of otitis media

Future Direction

- A broader analysis of differences in rates of exposure to a greater number of risk factors for otitis media between urban and rural Indigenous children
- May include
  - Greater sample size from an urban location
  - Greater availability of data from the Northern Territory

Benefits to the Community

- Reduce disproportionate burden of disease experienced by Indigenous children through targeted, evidenced based interventions
- May lead to improved education outcomes and reduced social and economic disadvantage
- May assist in closing the gap in morbidity and mortality between Indigenous and non-Indigenous Australians

Thank you

Questions?

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