

NATIONWIDE SURVEILLANCE OF PAEDIATRIC EMPYEMA IN NEW ZEALAND 2014 -2016

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BACKGROUND

- Empyema is a rare yet serious complication of childhood pneumonia
- Mortality in children is low
- Significant morbidity is associated with potential for surgical intervention, prolonged hospital stay and intensive care
- Incidence is increasing worldwide; despite reductions in pneumonia and invasive pneumococcal disease associated with pneumococcal conjugate vaccine (PCV)¹
- *Streptococcus pneumoniae* is the most common causative organism with *Staphylococcus aureus* also important in New Zealand.^{2,3}

AIMS

- To document the burden of empyema in children aged <15 years in New Zealand including infectious aetiology, demographic and underlying conditions
- To describe surgical and medical management, complications and outcomes

METHODS

- Monthly notification of empyema cases in children aged 0-14 years admitted to hospital were notified to the New Zealand Paediatric Surveillance Unit (NZPSU) 1st May 2014 through to 1st June 2016.
- Clinician questionnaires were used to collect demographics, management, laboratory results, complications and outcomes.

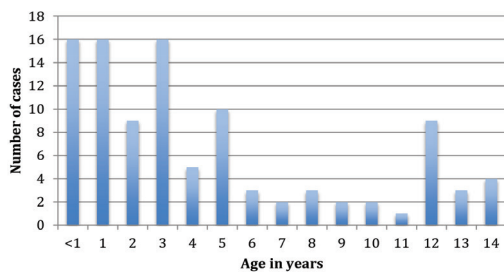
RESULTS

- 127 notifications were received with 109 fulfilling the case definition and complete data available for 101 cases (93%)
- Annual incidence of empyema related hospitalisations was 5.7/100,000 in children <15 years

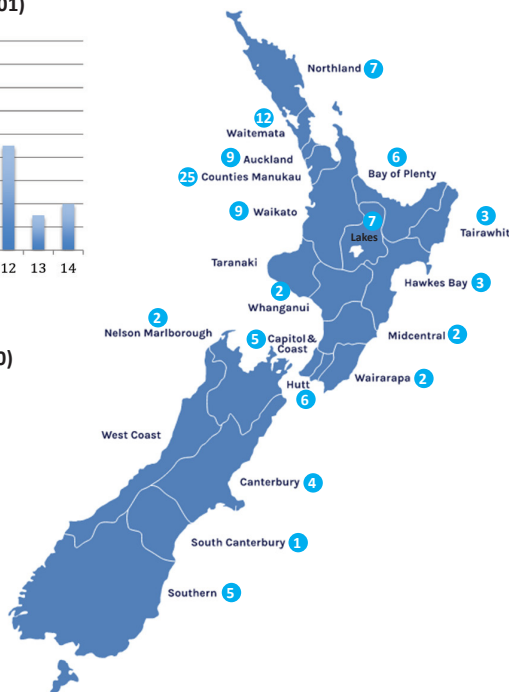
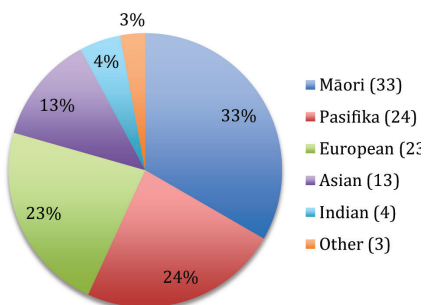
Demographics:

- Gender distribution 54% male
- Median age 3.8 years (range 2 months to 14.9 years)
- 61% aged < 5yrs
- 46% of cases lived in the greater Auckland area
- Immunisation status; Hib 92%, PCV ≥3 doses 63%, Influenza <1%
- 26% of children had comorbidities ranging from mild asthma or eczema to immune-compromising conditions (such as Type 1 DM, neuroblastoma or polyarticular JIA on etanercept)

Age at presentation with empyema (N=101)



Prioritised ethnicity of empyema cases (N=100)



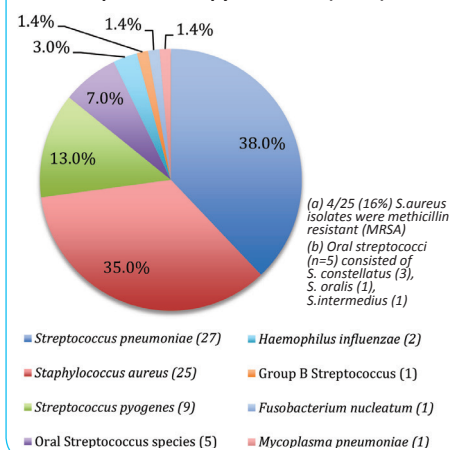
Management:

- 81% required surgical intervention including pleural aspirate alone, pleural drain, pleural drain+fibrinolytic, Video Assisted Thorascopic Surgery (VATS) or open thoracotomy
- 19% managed conservatively with IV antibiotics alone
- 87% of cases were treated with empiric antibiotics in line with clinical guidelines^{4,5}

Microbiology:

- Causative organism was detected in 70%
- Of the 71 organisms detected, *S. pneumoniae* was the most common organism followed by *S. aureus* and *S. pyogenes*

Organisms detected in sterile sites in hospitalised empyema cases (N=71)



Hospital Stay:

- Mean length of hospital stay: 18 days (range 6 to 56 days)
- 32% of cases required intensive care unit admission
- Mean length of ICU stay: 9 days (range 1 to 36 days)
- No deaths attributed to empyema

DISCUSSION

- Paediatric empyema rates in NZ appear higher than the UK (2.7/100,000) and Australia (<1/100,000) at 5.7/100,000
- Māori and Pasifika children were over-represented (33% and 24% of cases respectively)
- Nearly ¾ of empyema cases had a bacterial pathogen identified
- *S. pneumoniae* was the most common organism (38%) followed closely by *S. aureus* (35%) of which 20% were MRSA
- Increasing incidence of MSSA invasive disease is well reported in NZ with stable MRSA proportion but we report high MRSA in this cohort⁶
- Empyema cases reflect significant morbidity with a majority requiring surgical intervention, 1/3 requiring ICU, and prolonged hospitalization (18 days).

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