Investigating trends in Hepatitis B epidemiology within Indigenous populations in the Northern Territory

Ashleigh Qama, Benjamin C. Cowie, Joshua S. Davis, Jane Davies
14 August 2018

Chronic hepatitis B in Australia

1% of Australians have CHB
3.7% of Indigenous Australians have CHB


3.4% 6.1%

Highest CHB prevalence is in the NT
HBV vaccination in the NT

- **1990**: Universal infant vaccination against HBV introduced
- **1998**: School catch-up program for children aged 6-16 years
- **30%**: of the NT population identifies as Indigenous

Vaccination rates in Indigenous infants are now the same as non-Indigenous children.

Methods

- Results for all* HBV tests between 1991 – 2011 in the NT were sourced
- Matched with NT patient data
  - Demographics – age, current residential location, Indigenous status
  - Track people over time
- Tests included HBsAg, anti-HBs, anti-HBc, HBeAg, anti-HBe
  - No titres
  - Viral loads for < 1% of tests
  - No vaccination records
- Vaccination status assessed longitudinally by person, not per individual test

*all = 97.9%
Serology status classification

No markers
- HBsAg negative
- anti-HBs negative
- anti-HBc negative

HBV positive
- HBsAg positive
- anti-HBs negative
- anti-HBc either

Vaccinated
- HBsAg negative
- anti-HBs positive
- anti-HBc negative

Isolated cAb
- HBsAg negative
- anti-HBs negative
- anti-HBc positive

Natural immunity
- HBsAg negative
- anti-HBs positive
- anti-HBc positive

Unknown
- HBsAg negative
- anti-HBs negative
- anti-HBc negative

Demographics

219,134 tests
103,147 individuals
32 years old
545 days
Demographics

- Female: 60.4%
- Indigenous: 47.2%
- Remote or very remote: 43.9%
- Eligible for routine vaccination programs: 21.8%

Yearly HBsAg point prevalence, 1991 to 2011
Yearly HBsAg point prevalence, 1991 to 2011

Universal infant vaccination
School catch-up vaccination program

% HBsAg positivity

Year

OR = 4.27 (4.06, 4.49)

Yearly HBsAg point prevalence, school catch-up cohort

% HBsAg positivity

Year

OR = 3.01 (2.61, 3.48)
Yearly HBsAg point prevalence, universal vaccination cohort

OR = 1.24 (0.93, 1.66)

Vaccination status, eligible for routine vaccination programs
Vaccination status, eligible for routine vaccination programs

% of tests

- Indigenous
- Non-Indigenous

No markers | Vaccinated | Natural immunity | HBV positive | Isolated Ab

* p < 0.05
Test of two proportions, Bonferroni adjustment

Vaccination status, school catch-up cohort

% of tests

No markers | Vaccinated | Natural immunity | HBV positive | Isolated Ab

* p < 0.05
Test of two proportions, Bonferroni adjustment
Vaccination status, school catch-up cohort

- % of tests
- No markers, Vaccinated, Natural Immunity, HBV positive, Isolated CD8
- Indigenous vs. Non-Indigenous
- * p < 0.05
  Test of two proportions, Bonferroni adjustment

Vaccination status, universal vaccination cohort

- % of tests
- No markers, Vaccinated, Natural Immunity, HBV positive, Isolated CD8
- Indigenous
Summary of our findings

- HBV is still an issue in the NT, with a higher yearly point prevalence than the national average
  - Even in the universal infant vaccination cohort
  - Prevalence is being driven by 79.2% of participants not eligible for routine vaccinations
- HBV rates are higher in Indigenous Australians than non-Indigenous people
  - This gap is narrowing for children born after 1990
- Vaccine-derived immunity is lower in Indigenous people over 28 years old
- Immunity through past infection is higher in Indigenous people
Future directions

Why are levels of vaccine-derived immunity lower in Indigenous people?

How long did it take susceptible people to contract HBV?

What about those people with viral load data available?

How many people seroconvert, and are there any predictive factors?

Acknowledgements

Jane Davies
Department of Global and Tropical Health, Menzies School of Health Research

Ben Cowie
WHO Collaborating Centre for Viral Hepatitis, at the Peter Doherty Institute for Infection and Immunity

Josh Davis
Division of Medicine, John Hunter Hospital
Acknowledgements

WHO Collaborating Centre for Viral Hepatitis
VIDRL, Doherty Institute – Epidemiology Unit
Nicole Allard, Chelsea Brown, Benjamin Cowie,
Jennifer MacLachlan, Karen McCulloch, Ashleigh Qama,
Nicole Romero, Laura Thomas

Research & Programmatic Funding
Department of Health and Ageing, Australian Government
Department of Health and Human Services, Victoria
Melbourne Health Office for Research & RMH Foundation
Cooperative Research Centre for Spatial Information
Peter Doherty Institute for Infection and Immunity

+ our Research Advisory Group
www.doherty.edu.au/whoccvh