Travel Vaccination Update

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HealthEd.
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COI
• Current – nil
• Historical pharmaceutical industry funding to my research institute (MCRI) for special risk and vaccine safety projects

Outline
• Travel advice
  • General
  • Vaccines (age specific recommendations)
    • BCG
    • Meningococcal
    • Influenza
    • others
  • Malaria prophylaxis

General Advice

http://www.rch.org.au/kidsinfo/fact_sheets/Travel_health_advice/

Checklist

PRE-TRAVEL CHECKLIST
Pre-travel medical appointment (at least 6 weeks before your trip)
Travel insurance
Letter from your doctor (living medical problems, medications, equipment)
Car seat
FIRST AID kit
Oral rehydration solution
DEET-containing insect repellent for travel to tropical areas
Bed nets and insect repellent treatment for clothing for travel to tropical areas

http://www.rch.org.au/kidsinfo/fact_sheets/Travel_health_advice/

Steffen graph: travel epi

http://www.rch.org.au/kidsinfo/fact_sheets/Travel_health_advice/
What about the kids?

Risk factors

- Risk of infection & severity
  - Gastrointestinal (dehydration)
  - Influenza (hospitalisation)
  - Malaria

- Risk of adverse events following immunisation (AEFI)
  - BCG
  - Yellow fever (must be > 9-months of age)

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Diarrhoea


Medications: Travelers diarrhoea

- Beware

  ![Antibiotics: Azithromycin; Norfloxacin; Ciprofloxacin](image-url)
Vaccine(s) efficacy children

- Polysaccharide vaccines don’t work in infants < 2-years……
  - PPV23
  - Typhoid vaccines
  - Influenza vaccine > 6-months
    - Require maternal immunisation for protection
- Live –vaccines
  - Interaction with maternal antibody
  - Measles (consider @ 9-months of age)- high risk destination (e.g. Philippines; Disneyland)

Specific vaccines

BCG Background

- BCG- Isolated from a cow with TB [Mycobacterium bovis]
- Attenuated over a 10 year period - early 1900s- used since 1921
- ‘7 daughter strains’- different laboratories
- Uncertainty... re differences in efficacy and safety

BCG Rationale

- Highest efficacy for infants in the 1st year of life
  - ~ 70-90% TB meningitis and miliary TB
- Australian recommendations [state funded]
  - Children, < 5 years, who will be travelling to countries where annual TB incidence is > 40/100,000
  - > 1-month; frequent trips (cumulative)
  - Aboriginal and Torres Strait Islander neonates living in high-incidence areas
  - Neonates born to parents with leprosy or a family history of leprosy.

5000 Queensland babies on waiting list for tuberculosis vaccine
### Current Vaccines Australia

<table>
<thead>
<tr>
<th>Name</th>
<th>Strain</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG 10 (Poland)</td>
<td>0.1 mL contains 1.5–6x10⁵ cfu of Brazilian Moreau strain, Polish variant</td>
<td>Multi dose vial (MDV) Intradermal 0.05ml &lt;12-months 0.1 ml &gt; 1 year</td>
</tr>
<tr>
<td>Serum Institute India (SII)</td>
<td>0.1 mL contains 2–8x10⁵ cfu of Moscow strain (also known as BCG: Russia)</td>
<td>As above</td>
</tr>
</tbody>
</table>

### Pragmatics
- No licensed TGA product
- Authorised prescriber- informed consent
- Focus on children < 12-months
- No TST required if nil previous travel/ TB case (household contact)

### SA Health

Update on availability of BCG vaccine
Tuesday, 4 July 2017

No BCG vaccine registered by the Australian Therapeutics Goods Administration (TGA) has been available for use in Australia since December 2015. It is not certain when a registered BCG vaccine will be available on a secure basis.

As a temporary alternative in 2017, a BCG vaccine product from the Serum Institute of India (SII), which is a World Health Organisation (WHO) prequalified, has been obtained by the SA Health Immunisation Program. This BCG vaccine has been assessed by the Australian Technical Advisory Group on Immunisation (ATAGI) as suitable for use on quality and safety grounds, but it is not registered or approved for marketing by the TGA in Australia. Therefore its provision will be through special prescribing arrangements with the TGA and will require a specific process of informed consent by the patient or parent/guardian before vaccination can occur.

### RCH Melbourne
- Public clinic (weekly) for infants < 12-months

http://www.rch.org.au/immmunisation/clinics/
Meningococcus

- Neisseria meningitidis, often referred to as *meningococcus*, is a Gram-negative bacterium
- Six main serogroups that cause disease:
  - A, B, C, W135, Y (and X...)

Invasive Meningococcal Disease (IMD) presentation

- Typical
  - Septicaemia
  - Meningitis
- Atypical
  - Pneumonia
  - Septic arthritis
  - Pericarditis

IMD Outcome

- Mortality 5-10%
- Long term sequelae 10-20 %
  - Significant burden
  - Scars (5%), neurological deficits (2.6%)
  - Partial/full amputation of limbs (1.7%)
  - Deafness (0.9%),

Global Epidemiology

SAEFVIC: BCG AEFI

- Primary reaction
  - Abscess
  - Lymphadenopathy
  - Rash
  - Drug error (Program error)
  - Nodule at injection site

**Meningococcus**

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- Six main serogroups that cause disease:
  - A, B, C, W135, Y (and X...)
Australian IMD (by serogroup)

IMD in Australia [2016]

<table>
<thead>
<tr>
<th>Sero-group</th>
<th>VIC</th>
<th>TAS</th>
<th>WA</th>
<th>ACT</th>
<th>NSW</th>
<th>NT</th>
<th>QLD</th>
<th>SA</th>
<th>Aus</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>18</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>27</td>
<td>2</td>
<td>17</td>
<td>23</td>
<td>94</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>W</td>
<td>48</td>
<td>4</td>
<td>12</td>
<td>1</td>
<td>27</td>
<td>0</td>
<td>13</td>
<td>5</td>
<td>110</td>
</tr>
<tr>
<td>Y</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>16</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td>Rate (per 100,000 pop)</td>
<td>1.3</td>
<td>1.0</td>
<td>0.8</td>
<td>0.5</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.8</td>
<td>1.1</td>
</tr>
</tbody>
</table>

11 deaths (7 Men W; 2 Men B; 2 Y)

Age specific Men W rates [2012-16]

IMD - vaccine preventable

- National Immunisation Program (NIP)
- Hib-Men C @ 12-months

Meningococcal vaccines available

- MenB
  - Bexsero [GSK]
- Men ACWY (conjugate vaccine)
  - Menveo [GSK]
  - Menactra [Sanofi]
  - Nimenrix [Pfizer]
Men ACWY [polysaccharide vaccines]

- Menomune [Sanofi]
- Mencevax [Pfizer]
- Not on market since ~ March 2017

Opportunistic travel advice

- IMD vaccines
- Should be in the fridge....
  - Father tip to the Hajj
  - Adolescent – Year 10 trip to South America
  - Pre-teen- school trip to Vietnam
- Infant 6-months*, who came for BCG only!
  - Also recommend an influenza vaccine
- *note vaccine recommendations in infants < 2years vary by MenACWY brand

Incidence of suspected meningitis cases declined by 57% (95% CI 55–59) in vaccinated compared with unvaccinated populations, with some heterogeneity observed by country....

In fully vaccinated populations, the incidence of confirmed group A disease was reduced by more than 99%.

Case

- 2 year- 2 month old going to live with family in northern Thailand for 6-months
- Parents working for an NGO
- What vaccines to consider?
Travel vaccines [age recommendations]

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A</td>
<td>&gt; 12-months</td>
<td>2-doses; &gt;6-months apart (lifelong protection)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can consider even if present day before departure...</td>
</tr>
<tr>
<td>Typhoid injected</td>
<td>≥ 2-years</td>
<td>Single dose (booster 3-5 years) Can be Vivax (Hep A-Typhoid)</td>
</tr>
<tr>
<td>Influenza (annual)</td>
<td>≥ 6-months</td>
<td>2-doses 1st year if &lt;9 years ½dose if &lt; 3-years (junior)</td>
</tr>
</tbody>
</table>

Malaria

- General advice re- mosquitoes
- Clothing
- Use ‘strong’ (30% DEET) repellant
  - all ages
- Risk (dawn and dusk)
- Mosquito net
- Other diseases (Dengue; Chikungunya; JE)

Malaria prophylaxis

<table>
<thead>
<tr>
<th>Medication</th>
<th>Age / wt limit (dose variation)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefloquine (Lariam)</td>
<td>&gt; 3-months or 5 kg</td>
<td>2-3 weeks pre, during and 4 weeks post travel</td>
</tr>
<tr>
<td>Atovaquone-proguanil (Malarone)</td>
<td>&gt; 5-kg</td>
<td>for 1-2 days pre, during and 7 days post travel</td>
</tr>
</tbody>
</table>

*Doxycycline contraindicated in children < 8-years
Take away points

• Think about the kids...not just young adults
• Vaccine recommendations vary by age
  • BCG vaccine available & recommended
  • but ongoing issues with TGA approval
• IMD now potentially vaccine preventable @ all ages B & ACWY
• Consider seasonal influenza vaccine for all travellers > 6-months of age
• Malaria prevention & prophylaxis
• Cost considerations- specialist advice as required

Acknowledgements

• RCH Immunisation service
• SAEFVIC- vaccine safety service
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