Travel-Related Infections in Canadian Children

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Objectives

- To discuss travel-related illnesses in Canadian children
- To review the TRIP study results
- To provide some preliminary data from the TRIP-VFR study
- To describe areas for future consideration
> 7,400,000 Canadians traveled internationally in 2007
- Up to 75% develop travel-related health problems

~300,000 Canadian children

Pediatric travellers have a disproportionate risk of travel-related hospitalizations
- British study showed 23% of children with fever post-travel to the tropics had a potentially fatal illness
Pre-Travel Assessment

- Assess the risk:
  - Details of the travel itinerary: destination, duration, style and purpose of travel, travel-related activities
  - Season of travel, time before departure
  - Underlying health and immunization status
- Ensure routine immunizations have been given
- Recommend appropriate vaccines
- Provide malaria prophylaxis if required
  - http://www.cdc.gov/malaria/risk_map/
- Discuss use of bednets, insect repellent, clothing
- Discuss care with water and food, management of diarrhea
- Discuss risk of injury and road accidents
Post-travel History

- Regular history PLUS
  - Details of the travel itinerary (micro-epidemiology):
    - Destination(s): all locations, rural or urban
    - Duration: timing of travel (incubation period)
    - Style and purpose of travel: VFRs, MKs
    - Travel-related activities: fresh water exposure, animal exposure, insect exposure
    - Food and water precautions and exposures
    - Potential exposures to blood-borne pathogens
  - Season of travel
  - Underlying health and immunization status
  - Health during travel: illnesses, medications taken
Who travels?
Who travels?
Demographics - Immigrants

- 247,243 immigrants entered **Canada** in 2008
  - 50,303 (20%) of those were < 15 years old
  - Top 5 countries of origin: China, India, Philippines, USA, UK
  - 9% refugees

- 11,221 immigrants entered **Manitoba** in 2008 (4.5% vs. 3.6% of Canadian population)
  - 72% stayed in Winnipeg
  - Top 5 countries of origin: Philippines, Germany, India, China, Korea
  - 9% refugees

Data from Citizenship and Immigration Canada:
Immigration by Source Country

Canada – Permanent residents by top 10 source countries, 2006-2008

Immigration by Province (2008)

- Northwest Territories (0.1%)
- Newfoundland & Labrador (0.3%)
- Prince Edward Island (0.6%)
- Nova Scotia (1.1%)
- New Brunswick (0.8%)
- British Columbia (17.8%)
- Québec (18.3%)
- Alberta (9.8%)
- Saskatchewan (2.0%)
- Manitoba (4.5%)
- Ontario (44.9%)

VFRs - Visiting Friends and Relatives

- Immigrant children are most likely to visit country of origin (>100,000 Canadian pediatric VFRs per year)
- Highest morbidity rates of all travelers
  - Enteric fever, malaria, hepatitis A, febrile illnesses, nondiarrheal intestinal parasites, respiratory diseases, TB, STIs
  - Increased risk of severe disease
- Often unaware of the risks associated with travel
- Lack of knowledge about immunity
- May not seek travel advice or malaria prophylaxis prior to visits
Why does this matter?

- Immigrant children and children who travel internationally: ~1,000,000 children in Canada
- Burden of illness and unmet gaps in the system unknown
  - Travel-related illnesses
    - Most are preventable
    - Many have associated morbidity, potential mortality, potential public health implications
Travel-related Illnesses in Pediatrics (TRIP) CPSP Survey

- How frequently do CPSP participants see paediatric patients with travel-related illnesses?
- Where have these patients travelled?
- What types of illnesses have they acquired?
Methods

- Canadian Paediatric Surveillance Program
  - Active surveillance program
  - ~2,500 pediatricians and pediatric sub-specialists
  - Monthly mailings
- Survey developed
- Mailed out August 2008 (last response returned Sept. 2009)
TRIP Survey

- 631 respondents (25%)
  - 29% (185) had seen children with travel-related illnesses (TRI) in the last 12 months
  - Number of children with TRIs
    - Mean – 7
    - Median – 3
Number of children with TRIs seen by CPSP participants over the preceding 12 months

- 1-4 children: 60%
- 5-10 children: 28%
- 11-20 children: 8%
- >20 children: 4%
Type of pediatric travelers seen by CPSP participants

- VFRs: 71%
- Tourists: 46%
- Immigrants: 46%
Categories of children travelers with TRIs seen by CPSP participants

- Tourists only: 9%
- VFRs only: 28%
- Immigrants only: 11%
- VFRs and Tourists: 10%
- VFRs and Immigrants: 9%
- Tourists and immigrants: 6%
- VFRs/Tourists/Immigrants: 15%
- Not specified: 12%
Destination of travel for children with TRIs

- Africa: 51%
- South/Central America: 24%
- Mexico: 28%
- Caribbean: 29%
- India: 43%
- China/Hong Kong: 18%
- Other Asian countries: 31%
- Other: 6%
Most commonly seen TRIs

- **Diarrheal diseases requiring hospitalization**
  - No. of respondents – 105 (57%)
  - Minimum no. of cases – 152
- **Enteric fever**
  - No. of respondents – 65 (35%)
  - Minimum no. of cases – 107
- **Malaria**
  - No. of respondents – 64 (35%)
  - Minimum no. of cases – 119
Denotes cases requiring hospitalization.

Examples of other parasitic infections were schistosomiasis and helminths.

Examples of zoonotic diseases (transmitted by animals) were leptospirosis and anthrax.

Examples of other insect-borne diseases were rickettsia, viral fevers including yellow fever and chikungunya, and leishmaniasis.
Potentially fatal TRIs – 44%

- Malaria
- Enteric fever
- Dengue
- TB disease
- Japanese encephalitis
- Animal bites (rabies)
Potentially preventable TRIs – 70%

- Vaccine preventable
  - Enteric fever
  - Hepatitis A
  - Hepatitis B
  - Japanese encephalitis

- Insect precautions
  - Malaria
  - Dengue
  - Zoonotic diseases
  - Other insect-borne diseases

- Food and water precautions
  - Diarrheal diseases requiring hospitalization

- Chemoprophylaxis
  - Malaria
Limitations

- 25% response rate
- Most severe and more uncommon TRI cases are referred to pediatricians, but not all
- CPSP restrictions
Discussion points

- ~1/3 of CPSP respondents have seen ≥ one child with a TRI
- 71% have seen TRIs among pediatric VFRs
  - Africa, India, other Asian countries
- > 40% of TRIs were potentially fatal
- 70% of TRIs were potentially preventable
  - 29% were vaccine preventable
Travel-related illnesses in pediatric VFRs (TRIP-VFRs)

- 71% of respondents had seen TRI in VFRs
- Currently there is very little data regarding TRIs in pediatric VFR travellers
- CPSP surveillance study: Travel-related illnesses in paediatric travellers who visit friends and relatives abroad
  - Numbers
  - Epidemiology
  - Clinical manifestations and severity of illnesses
  - Risk factors
- Surveillance began in March 2009
Results from TRIP-VFRs

- Cases from March 1 to December 31, 2009
  - 50 reported
  - 1 duplicate
  - 8 excluded
  - 11 pending
  - 30 confirmed
## Types of TRIs acquired by pediatric VFRs

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue</td>
<td>1</td>
</tr>
<tr>
<td>Enteric fever (suspected /confirmed)</td>
<td>11 (3/8)</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>4</td>
</tr>
<tr>
<td>Malaria</td>
<td>4</td>
</tr>
<tr>
<td>TB symptomatic disease</td>
<td>1</td>
</tr>
<tr>
<td>Parasitic infections</td>
<td>3</td>
</tr>
<tr>
<td>Severe respiratory illness</td>
<td>2</td>
</tr>
<tr>
<td>Severe diarrheal illness</td>
<td>3</td>
</tr>
<tr>
<td>Sepsis</td>
<td>1</td>
</tr>
</tbody>
</table>
Region of travel associated with TRIs

- Middle East
- Africa
- Asia
- Central/S America
Presentation

- Fever  70%
- Diarrhea  40%
- Vomiting  20%
- Abdominal pain  20%
- Headache  17%
Risks for TRIs

- Type of accommodation
  - All stayed in family homes
  - 10% with air-conditioning and/or insect screens
- Ingestion of food from street vendors – 17%
- Ingestion of unsafe water – 30%
- Ingestion of unpasteurized dairy products – 7%
- Uncooked/unpeeled fruits and vegetables – 27%
Pre-travel advice

- 10 did not seek pre-travel advice
- 8 – unknown
- 12 obtained pre-travel advice
  - 6 from a travel clinic
  - 2 from a family doctor
  - 3 from a pediatrician
  - 1 - unknown
Pre-travel advice

Among the 12 who sought pre-travel advice
- 17% received inappropriate advice
- 25% did not follow the advice received
- 50% - unknown if advice was inappropriate or not followed
- 1 patient – given Typhoid vaccine but got enteric fever (S. typhi)
Outcomes

- 19 patients (63%) required hospitalization
- Average length of stay = 7 days
- 1 death due to septic shock
Future areas for consideration

- More detailed information regarding TRIs in Canadian children
- Knowledge translation
  - Family education
  - Physician education
  - Advocacy for improved access to pre-travel advice
- CaNTRIP (Canadian Network for Travel-Related illnesses and Immigrant health in Pediatrics)
Acknowledgements

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