Rare Influenza B Skin Rash in Northern Health

Background:
There are three types of influenza viruses: A, B and C. Human influenza A and B viruses cause seasonal widespread activity of disease generally between October and May in the northern hemisphere\(^1\). Influenza type C is rare and believed to cause sporadic mild influenza-like illnesses in children and it is not included in the seasonal vaccine\(^2\).

Presenting symptoms of influenza do not typically include skin rash. Symptoms typically include the sudden onset of:
- Fever or feeling feverish/chills
- Cough
- Sore throat
- Runny or stuffy nose
- Muscle or body aches
- Headaches
- Fatigue (tiredness)
- Some people may have vomiting and diarrhea, though this is more common in children than adults.

During the week of March 10th, 2014, 15% and 9% absenteeism rates were reported in the elementary and secondary schools respectively in McBride, in the Northern Interior HSDA. Initial follow-up investigation by the Public Health Nurse manager revealed a cluster of exanthematous rash and fever. Hive-like appearance of some of the rash was noticeable. The rash affected the face, the torso and the upper and lower limbs. The other common symptom was transient high fevers. A total of 23 children were initially affected in both schools. Most of the children are not eligible for the free flu vaccine offered by the province.

Introduction:
This brief report will describe the subsequent investigations of this cluster including interviews, case finding of those with a similar rash, and laboratory identification.

Clinical Signs and Symptoms:
Initially, six of the students experiencing a rash were reported to public health nursing. Two of these students were seen earlier by the local physician who excluded all six-numbered childhood diseases that are associated with rash (exanthemata) but none was consistent with the presentation of the cases (Table 1). The physician also excluded Hand Foot Mouth Disease (Coxsackie virus) — which was rumoured to be active in the schools.

Virological Tests:
Virology was conducted to identify the virus and to measure antibody levels in serum produced by the body against the infection.

a. Virus isolation
The PHN manager took naso-pharyngeal swabs and urine samples from six rash cases for microbiology at the PHSA Laboratories in Vancouver. Additional viral identification studies were conducted.

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Increasing influenza B activity in BC
In week 10 (March 2 to 8, 2014), influenza activity remained stable, low levels in BC but with increasing contribution from influenza B. At the BC provincial laboratory, the overall influenza positivity rate was 15% in week 10 with influenza B viruses now comprising about half of all influenza positive specimens (23/45), up from just 5% in weeks 3-5, and suggesting late-season circulation of this virus warranting further monitoring. In week 10, 87% of subtyped influenza A viruses were A(H1N1) pdm09 and 13% were A(H3N2). Relatively few influenza A(H3N2) viruses have been detected cumulatively this season, compared to the 2012/13 season when A(H3N2) viruses predominated.

In week 10, two long-term care facility outbreaks and three school outbreaks were reported with laboratory results pending or due to unknown pathogens.

Table 1. Six Exanthematous Childhood Disease

| First disease: Measles (morbilliform viral rash) |
| Second disease: Scarlet fever (scarlatina) Group A streptococcus |
| Third disease: Rubella (German measles, viral rash) |
| Fourth disease: Filatov Duke disease - Exanthema subitum |
| Fifth disease: Erythema infectiosum Parvovirus B19 |
| Sixth disease: Roseola human herpesvirus 6 (HHV-6) |

Physician Actions Requested:
Northern Health physicians are reminded to include influenza tests for (pediatric) patients who present with rash and a history of fever, especially those occurring in clusters.

Acknowledgements:
Dr. M. Jackson, McBride District Hospital, McBride BC.
Dr. Danuta Skowronski, MD, FRCPC. Epidemiology Lead, Influenza & Emerging Respiratory Pathogens BC Centre for Disease Control
Dr. Mel Krajden, MD, FRCP(C) Medical Head, Hepatitis - Clinical Prevention Services Associate Medical Director, BCCDC Public Health Microbiology and Reference Laboratory BC Centre for Disease Control

References:

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b. Serological studies
Acute serological studies are being conducted for measles, influenza and parvovirus. Convalescent serum will be analyzed three weeks after the acute batch.

Results:
- Viral isolation tests including PCR detected Influenza B in five of six swabs sent to the PHSA Laboratories. Further characterization of influenza B virus is pending at the National Microbiological Laboratory in Winnipeg. The PHSA lab did not isolate any other viruses.
- Acute serological assays: These are pending.

Discussion:
Influenza is usually a respiratory viral infection with very few skin manifestations. Its classical symptoms of fever, chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, fatigue (tiredness) can be complicated by croup, bronchiolitis, pneumonia, bacterial sepsis, and cardiac, muscle or renal complications. There are some reports of influenza A being associated with a rash, but there are only three other reports of the influenza B virus being associated with a rash. All the previously reported cases occurred in children in Germany, United Kingdom and India.

This McBride report may be the first report of rash associated with influenza B in North America and the fourth globally.

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Dr. M. Jackson, McBride District Hospital, McBride BC.
Dr. Danuta Skowronski, MD, FRCPC. Epidemiology Lead, Influenza & Emerging Respiratory Pathogens BC Centre for Disease Control
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References:

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**Increased Pertussis Activity in the Northwest HSDA**

**Background:**
There has been a significant increase in the number of laboratory-confirmed cases of pertussis in the Northwest HSDA, particularly in the West Cluster (Prince Rupert and Haida Gwaii). The cases started emerging in late February and into March, and as of March 26, 2014, there are six confirmed cases in the Northwest, and one in the Northern Interior.

**Epidemiology & Control**
Pertussis is a highly infectious vaccine preventable respiratory bacterial condition that affects all ages. In unimmunized infants, Pertussis can be a more serious disease which starts as a common cold progressing into a cough. The cough can become severe, with or without the whooping sound and may be accompanied by gasping, gagging, shortness of breathing and vomiting as well as pneumonia. There may also be a mild, associated fever. Pregnant women are at risk if they are in the last three months of their pregnancy as whooping cough can cause serious disease and complications to the fetus.

**Introduction:**
The following sections will summarize the situation recently observed in the Northwest HSDA, with specific reference to the monitoring and control activities in place. The section also includes a depiction of the appropriate PHSA recommended nasopharyngeal swabbing for Pertussis bacteriological diagnosis.

**Figure 1: Epidemic Curve for Masset & Prince Rupert**

- **Masset**
- **Prince Rupert**

**Figure 2: Relationship graph**

**Summary**
The first of the six confirmed cases (an adult) was notified on March 6, 2014 in Masset. The epidemic curve below details the sequence of the onset of the remaining five cases. One infant was transferred to BC Children’s Hospital. Five additional confirmed cases were reported in Masset, Prince Rupert and Fort St. James (see figure 1 & 2, below). Appropriate public health follow-up was conducted to protect eligible close contacts to all the cases in accordance with the BC Communicable Disease Guidelines.

**Clinicians’ Role in Pertussis Control:**
- **Immunizations:** Doctors and other health care providers are encouraged to enquire about their patients’ immunization status and ask them to update their Pertussis and other immunizations where indicated.
- **Assisting Accurate Laboratory Diagnosis:** In addition to the need for early reporting and treatment of the widely known characteristic spasmodic coughs and inspiratory whoops, proper naso-pharyngeal swabbing assists with good laboratory tests and definitive diagnosis. The Provincial Health Services Agency Laboratories have provided in a one-page chart (below) the appropriate steps for clinicians to obtain adequate naso-pharyngeal swabs to assist with correct Pertussis laboratory confirmation.

**Source:**

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Dr. William Osei, MHO
Northern Interior HSDA

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Laboratory Collection Instructions for Pertussis Testing

Specimens:

- Optimal samples are pernasal swabs but postnasal swabs are also accepted, though less sensitive. DO NOT SUBMIT THROAT SWABS.
- Only Dacron tipped swabs with aluminum wire shafts should be used. COPAN swabs below are ideal.

COPAN 125C Amies Charcoal (soft aluminum wire, green tip)

Collection:

- **Personal protection during specimen collection:** Minimize self exposure by minimizing the amount of time spent in taking a sample, wearing personal protection and following infection control practices. Hands should be washed and fresh gloves used for each new patient.

Procedure:

1. **1st Choice: Pernasal specimens**
   1. **Label** the container with the patient’s full name and date of birth.
   2. Gently insert swab into one nostril straight back (not upwards) until it reaches the posterior wall. The distance from the nose to the ear gives an estimate of how far back the swab should be inserted. Do not force the swab. If an obstruction is encountered, try the other side.
   3. Rotate swab a few times, loosening the cells in the mucus cavity and then remove.
   4. Place the swab into the accompanying vial of Amies transport media.
   5. Fill out the **PHSA Labs Bacteriology & Mycology Requisition** form. (Available at [http://www.phsa.ca/AgenciesAndServices/Services/PHSA-Labs/Testing-Requisitions/Diagnostic.htm](http://www.phsa.ca/AgenciesAndServices/Services/PHSA-Labs/Testing-Requisitions/Diagnostic.htm))
   6. Seal in biohazard bag, refrigerate and ship as soon as possible in a cooler containing ice packs.

2. **2nd Choice: Postnasal specimens**
   1. **Label** the container with the patient’s full name and date of birth.
   2. Incline the patient’s head as required and insert the swab into the patient’s mouth.
   3. To avoid contamination from the oral cavity, bend the wire to an angle of 135° about 1 cm from the tip.
   4. Rest the swab against the posterior wall of the pharynx and move the tip up and down a few times.
   5. Place the swab into the accompanying vial of Amies transport media.
   6. Fill out the **PHSA Labs Bacteriology & Mycology Requisition** form.
   7. Seal in biohazard bag, refrigerate and ship as soon as possible in a cooler containing ice packs.