Measles infection

the japan times
NEWS

NATIONAL / SCIENCE & HEALTH

Measles infections confirmed in Tokyo following outbreak in Okinawa

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PRINT SHARE

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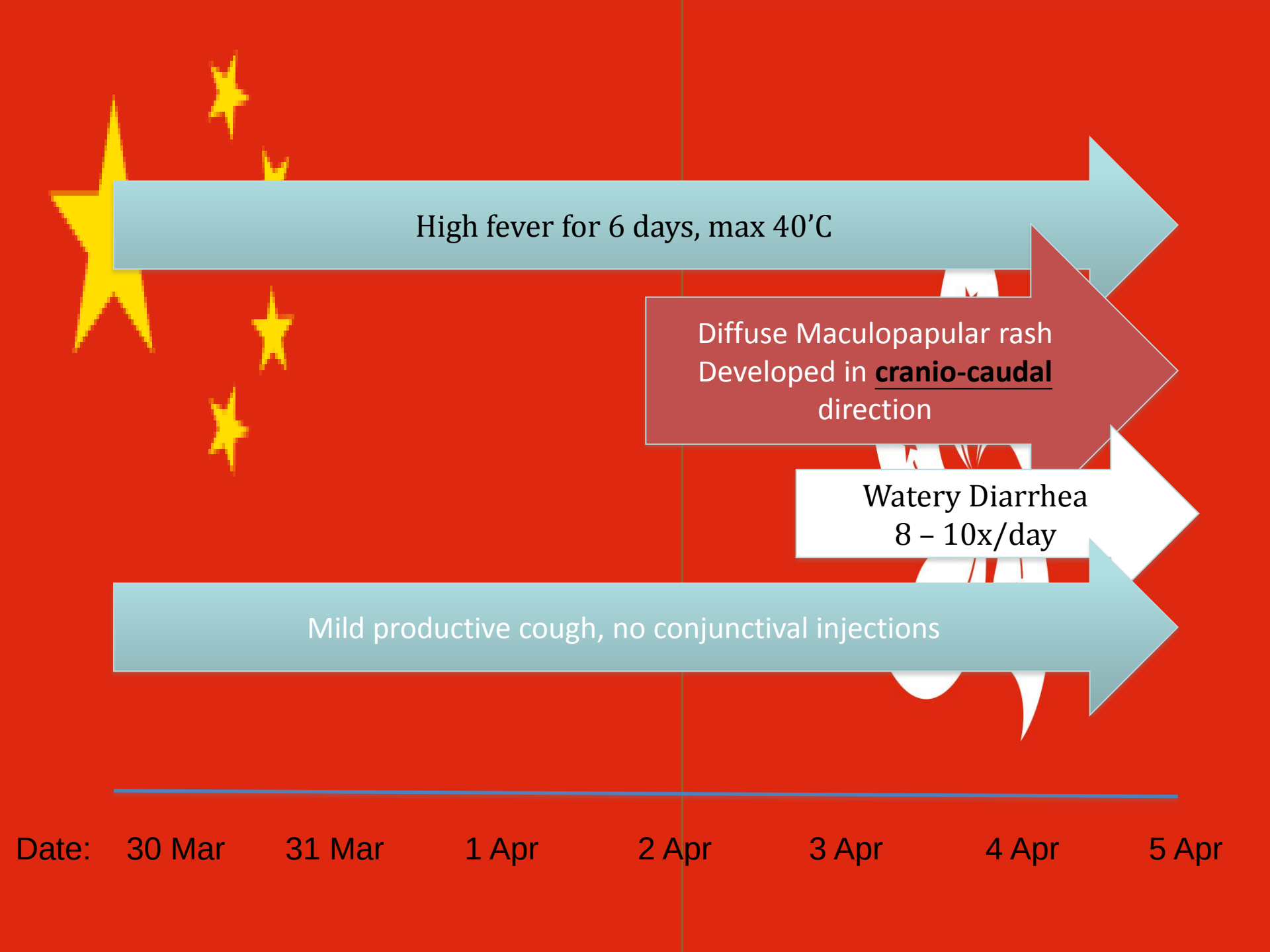
ARTICLE HISTORY

A Tokyo woman has been diagnosed with a measles infection, indicating the contagious disease has spread from Okinawa Prefecture to the

History

- 10 month old boy
- Birth history unremarkable
- Good past health
- Immunization history:
  - According to MCHC schedule up to 6months old
  - Not yet vaccinated with MMR-V vaccine
- Referred from Tsuen Wan Adventis Hospital to Princess Margaret Hospital for fever and rash


High fever for 6 days, max 40'C
Diffuse Maculopapular rash
Developed in cranio-caudal
direction
Watery Diarrhea
8 – 10x/day
Mild productive cough, no conjunctival injections
Date:
30 Mar
31 Mar
1 Apr
2 Apr
3 Apr
4 Apr
5 Apr

Contact History

- Travelled to **Jiang-Men, China** 19/3/2018 – 2/4/2018
- Visited wet market in China with live poultry at the vicinity
- Grandmother developed herpes zoster recently
- Mother developed fever on day of admission

Physical Examination

- Temperature 37.5'C
- Stable vitals
- No conjunctival injection
- Generalized macuopapular rash on face, neck, trunk, back and four limbs
- **Koplik Spots** present over bilateral buccal mucosa

- Working diagnosis: Measles!

Investigations

- Complete blood count
  - WCC 7.8, ANC 2.2, ALC 3.9, Monocyte 1.5
- Liver and renal function tests – normal
- NPA for respiratory viruses – negative
- **Measles IgM – positive!**
- Rubella IgM – negative
- Urine and Throat swab **Measles RNA Detected by RT-PCR**

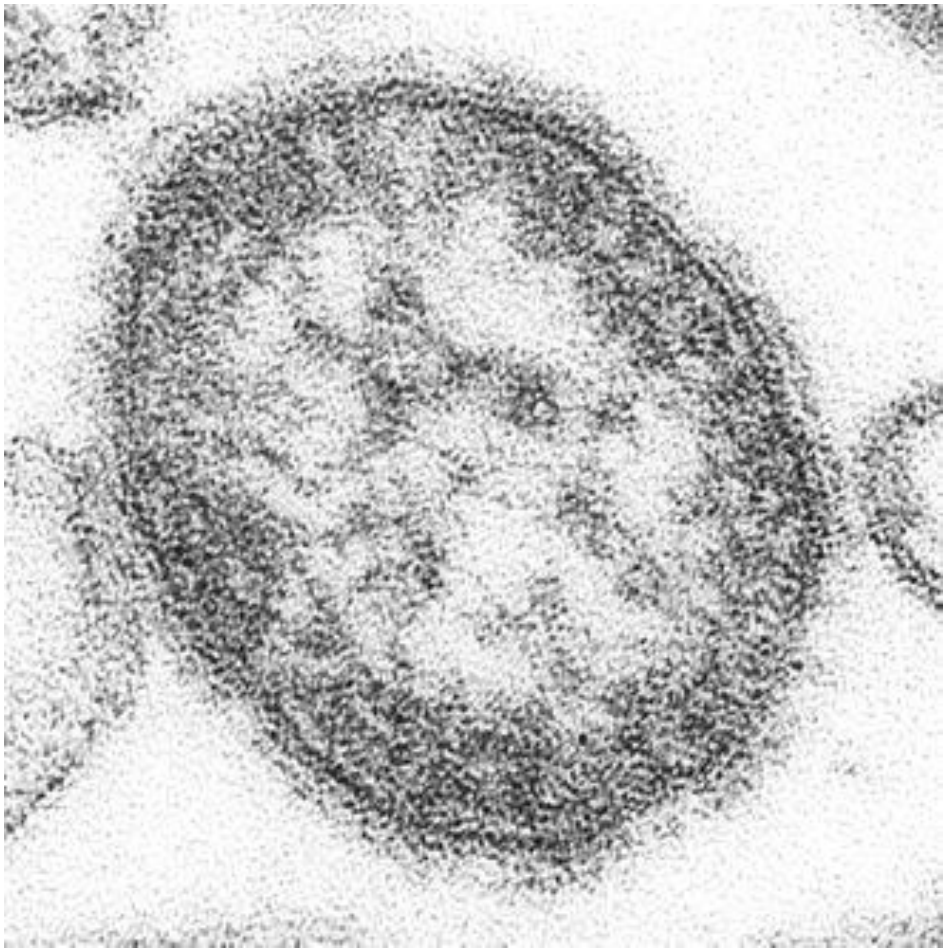
Progress

- Supportive therapy was given
- Rash and fever gradually subsided
- Improvement in oral intake
- Discharged on 5th day of admission (Day 11 illness)

Measles (*Rubeola, 1st Disease*)

- One of the earliest viral exanthem to be recognized,
- Globally, caused significant morbidity and occasional mortality through its complications,
- Measles elimination is a public health priority,
  - In 2016, estimated 7 million people were affected
- In September 2016, Hong Kong was certified by the WHO as having eliminated measles,
  - *Defined as absence of endemic measles transmission (existence of continuous measles transmission of indigenous or imported measles virus that persists for at least 12 months)*

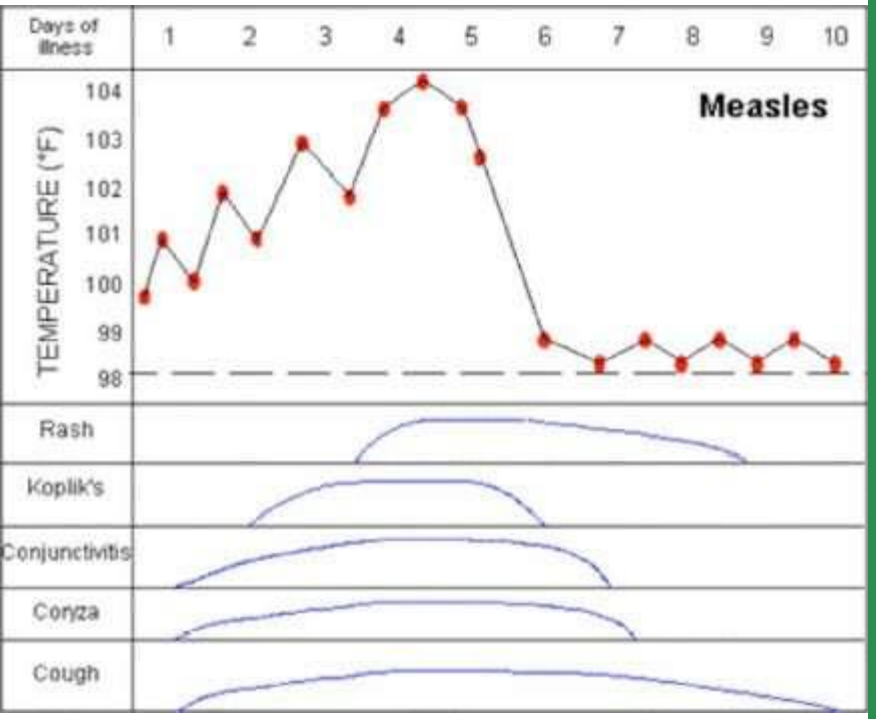
Measles Virus



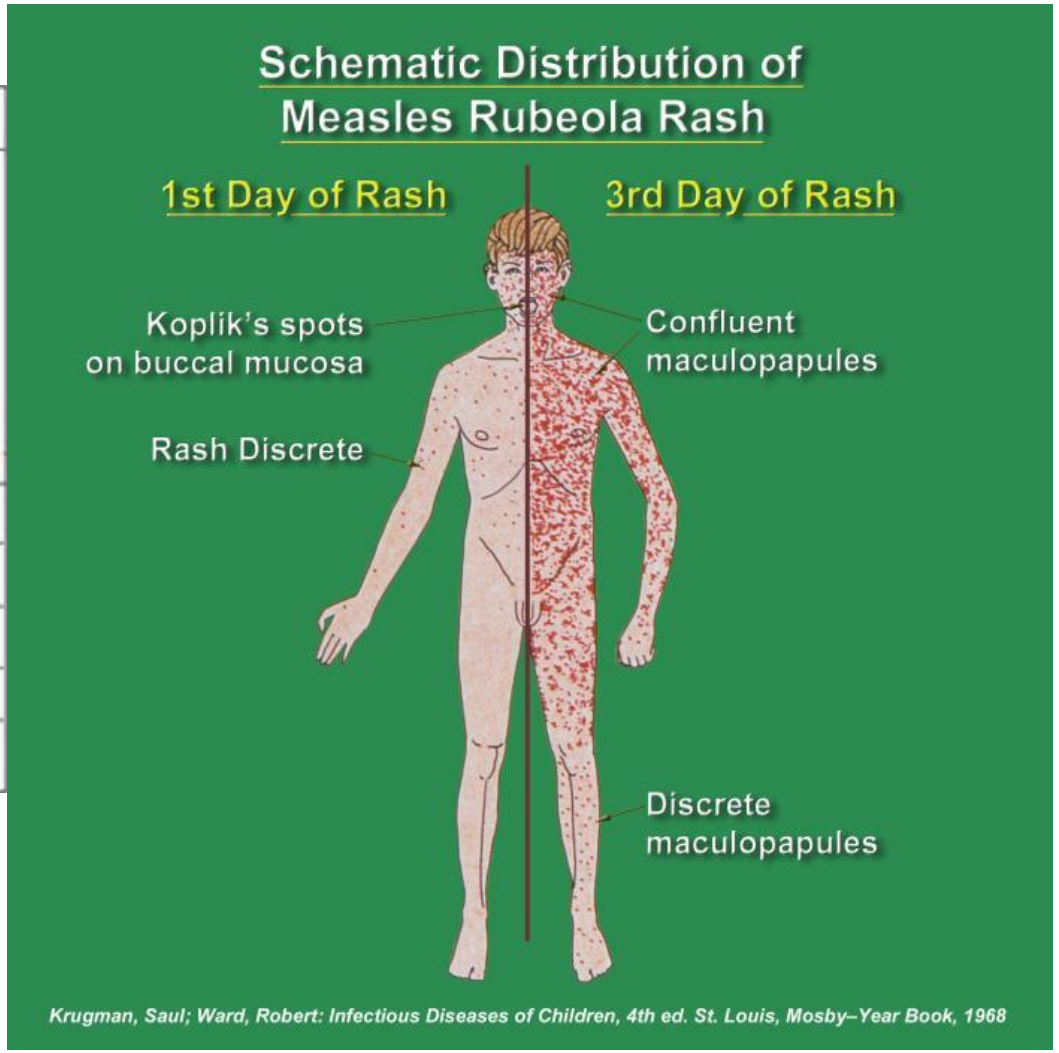
- Genus Morbillivirus
- Member of the Paramyxovirus family (副黏液病毒)
- Single stranded RNA and lipid envelop
- Human is the only host
- 1 Serotype

Measles Pathogenesis

- Respiratory transmission of virus
  - Aerosolized droplets of respiratory secretions
- Replication in nasopharynx and regional lymph nodes
  - Primary viremia 2-3 days after exposure
  - Secondary viremia 5-7 days after exposure with spread to tissues
- Establishment of infection in the skin and other viremic sites (respiratory tract)


Days of illness
1
2
3
4
5
6
7
8
9
10
Measles
TEMPERATURE (°F)
104
103
102
101
100
99
98
Rash
Koplik's
Conjunctivitis
Coryza
Cough

Measles


Schematic Distribution of
Measles Rubeola Rash
1st Day of Rash
3rd Day of Rash
Koplik's spots
on buccal mucosa
Confluent
maculopapules
Rash Discrete
Discrete
maculopapules
Krugman, Saul; Ward, Robert: Infectious Diseases of Children, 4th ed. St. Louis, Mosby–Year Book, 1968

Really Sick Children Must Take No Exercise

Qworld.co.in
HIGH YIELD PEDIATRICS
USMLE _ AIPGMEE

NUMBER OF DAYS AFTER FEVER ONSET THAT A RASH WILL APPEAR:

1 DAY: RUBELLA

2 DAYS: SCARLET FEVER/ SMALLPOX

3 DAYS: CHICKENPOX

4 DAYS: MEASLES (KOPLIK SPOTS ONE DAY PRIOR TO RASH)

5 DAYS: TYPHUS + RICKETTSIA (VARIABLE)

6 DAYS: NOTHING

7 DAYS: ENTERIC FEVER (SALMONELLA)

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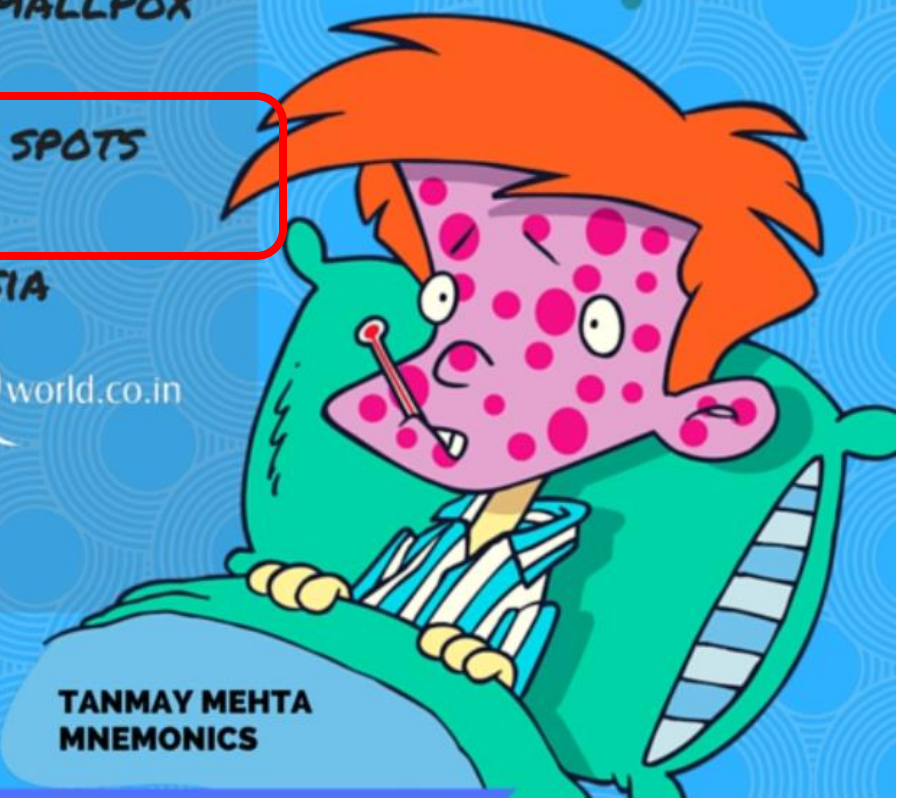

TANMAY MEHTA
MNEMONICS

Clinical Manifestation

- Highly contagious
- 90% of susceptible exposed individuals becoming infected
- Subclinical disease infrequent
- Incubation period: 8-12 days
- Average interval between appearance of rash in the index case and subsequent cases is 14 days (7-21 days)

Clinical Manifestation

- Acute viral disease, symptoms of common cold
- Fever, Cough, Conjunctivitis (photophobia) and Coryza
- Faint maculopapular rash beginning on the face then spread Cephalocaudally and Centrifugally
  → **Confluence,** especially on the trunk
- Within 2-3 days, the rash fade and take on a coppery darker color, then brownish discolouration (measles staining)
- Desquamation may occur
- Associated symptoms e.g. Diarrhea

- Koplik spots (Enanthema)
  - appears at the initial stage of the illness
  - Pathognomonic
  - First arise on the buccal mucosa opposite the lower molars, then spread quickly to involve most of the buccal and lower labial mucosa
  - Backround mucosa appears bright red and granular

Diagnosis

- Clinical: 3"C"s
  - Cough
  - Coryza + Diarrhea
  - Conjunctivitis
- Beware of "Atypical Measles"
  - *Modified Clinical Manifestations of Measles in Young Infants: 10 Years' Experience in a Tertiary Referral Centre of Hong Kong. Hong Kong Journal of Paediatrics (New series) 2010; 15: 126-131.*

Modified Clinical Manifestations of Measles in Young Infants: 10 Years' Experience in a Tertiary Referral Centre of Hong Kong

HK J Paediatr (New Series) 2010;15:126-131

WM Chan, SY Lee, YW Kwan, CB Chow, CW Leung

- From 1999-2008, study population (n=165) was divided into 2 groups:
  - 29 infants were aged <7 mths and 136 infants were 7-12 mths of age.
- The mean duration of fever in infants:
  - 4.6 vs 6.8 days in <7 mths and 7-12 mths respectively (p<0.001, 95% CI 1.24-3.04).
- The onset of skin rash:
  - 2.3 vs 3.7 days after the onset of fever in <7 mths and 7-12 mths respectively (p=0.001, 95% CI 0.58-2.12)
- Conjunctivitis (p=0.001) and staining of skin rash during convalescence (p=0.026) were significantly less common in the younger group
- There were no significant differences between the 2 groups regarding presence of coryza (p=0.07), cough (p=0.28), Koplik's spots (p=0.18), diarrhoea (p=0.72), pneumonia (p=0.74) and the use of antibiotics (p=0.74).

Anti-measles IgM Antibody

- 20% false negative if taken < 72 hours after rash onset (*AAP Red Book*)
- May need to repeat if taken too early
  - Detectable for at lease 1 month after rash onset in unimmunized people
  - May be absent or present only transiently in immunized people

- Should also test for rubella

Complications

- More common in young or malnourished (Vitamin A deficiency) children, immunocompromised hosts
  - Otitis media
  - bronchopneumonia
  - Laryngotracheobronchitis (croup)
  - Diarrhea - dehydration
  - Acute encephalitis (1/1000)
  - Death

Measles eye disease

Treatment

- **Supportive** (Fever, hydration, cough, nutrition)
- **Appropriate antibiotics** targeted at bacterial complications
- **Vitamin A treatment**

Vitamin A treatment

- Low serum concentrations of vitamin A was associated with severe measles
- Developing countries
  - Decrease morbidities and mortalities
- WHO recommends vitamin A for all children with measles regardless of their country of residence
- Administered once daily for 2 days, at dosage:
  - 200,000 IU for children 12 months or older
  - 100,000 IU for children 6 through 11 months of age
  - 50,000 IU for infants younger than 6 months
  - An additional age-specific dose should be given 2 through 4 weeks later to children with clinical signs and symptoms of vitamin A deficiency

Mortality

- Young (< 5 years of age)
- Immunocompromised
- Malnutrition (Vitamin A deficiency)

Diagnostic challenge

- Solely reliance on symptoms (fever + cough + coryza + rash) may not be adequate
- Recognize diarrhea as one of the common symptoms of measles
- Beware of “atypical measles”

- Remember to enquire a detail contact and travel history
- Immunization history
  - At risk of measles?
  - Beware of post-MMR rash

- Timely blood taking for anti-measles IgM
- Obtain appropriate specimens for viral study