PEDIATRIC INFECTIOUS DISEASE SOCIETY OF THE PHILIPPINES

PIDSP JOURNAL

Vol 16, No. 1
January-June 2015

Vol.16 No.1
January-June 2015

Pediatric Infectious Diseases Society of the Philippines Journal
Vol 16 No.1 pp. 36-40 Jan – Jun 2015
Sengson RF, Barro RJ, Tiopengco B. Fever and Rash in Mother and Baby

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INSTRUCTIVE CASE

YOUR DIAGNOSIS PLEASE: FEVER AND RASH IN MOTHER AND BABY

INTRODUCTION

B.S. was born live, full-term male, appropriate for gestational age, to a 40 year-old G2P2 (2002) mother via emergency repeat cesarean section (CS). His APGAR score was 8 and 9 at 1 and 5 minutes. His mother had an unremarkable course of pregnancy with regular pre-natal checkups. She had no history of hypertension, diabetes, asthma, thyroid disease, and no exposure to smoke, alcohol or x-ray.

However, one day prior to delivery, his mother developed intermittent low to moderate grade fever (T: 37.6-38C) with accompanying maculopapular rashes over the trunk and abdominal area. There were no joint pains or body malaise. This progressed and persisted until a day after, hence, emergency CS was done. Mother was discharged 48 hours after delivery afebrile but still with maculopapular rashes on the trunk and abdominal area.

Due to maternal fever, B.S. was admitted and worked-up for possible early-onset neonatal sepsis. On his first hour of life, blood culture and sensitivity were done and he was started on Ampicillin and Cefotaxime. His CBC revealed leukocytosis of 25.36 with predominance of neutrophils (67) and platelet count of 246 (Table 1). He remained to have stable vital signs, thermoregulated, active, and with good suck.

Table 1. Complete Blood Count Results of B.S.

CBC (normal values)	1st day of life	3rd day of life	7th day of life	10th day of life	12th day of life
Hemoglobin (110-200g/l)	242	178	154	157	122
Hematocrit (%)	63	51	41	43	35
WBC ($5\text{-}20\ 10^9$/L)	25.36	7	14.62	25.10	18.07
Neutrophils (%)	67	81	55	51	45
Lymphocytes (%)	21	12	31	37	44
Monocytes (%)			8		10
Eosinophils (%)			2		1
Platelet count ($150\text{-}400 \times 10^9$/L)	246	198	160	112	160

On the 72nd hour of life, patient developed intermittent low to moderate grade fever (37.8–38.3C) with accompanying macular rashes on the trunk and abdomen gradually spreading to both upper and lower extremities

Figure 1. Macular rashes on Trunk

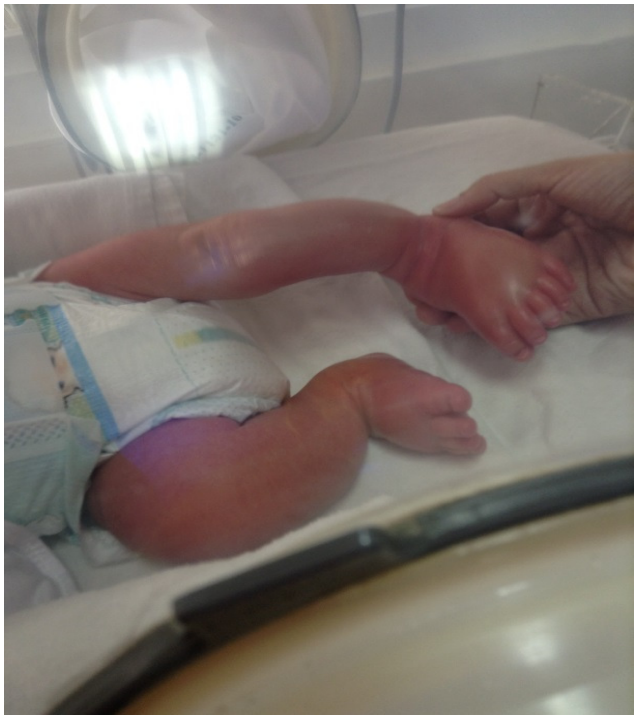

Figure 2. Edema of all Extremities

(Fig1). Hence, repeat CBC was done which revealed a wbc count of (7.0) and platelet count of (198). Thus, Ampicillin and Cefotaxime were shifted to Meropenem and Amikacin. C-Reactive Protein was also requested which revealed normal result.

On his 4th day of life, although his fever went down to 37.8C, he developed jaundice from face to chest and pitting edema in all his extremities (Fig2). There was one episode of circumoral cyanosis which lasted a few seconds. Cardiac rate and respiratory rate remained normal. Oxygen was started via nasal cannula at 2 LPM which provided improvement of cyanosis. Continuous phototherapy was started. He was referred to a pediatric infectious disease specialist and pediatric cardiologist. Chest X-ray and cranial ultrasound were requested. Result of blood culture was released and showed negative growth.

On his 5th day of life, he became afebrile. However there was another episode of circumoral cyanosis, which lasted for a few seconds. There was no noted change in the appearance of maculopapular rashes. In addition, the patient was noted to cry a lot when his extremities were extended.

On his 6th day of life, he remained afebrile with good suck tolerating oral milk feedings of 30-45cc every 3 hours. Vital signs remained stable. There was noted persistence of the rashes and edema.

What is your diagnosis?

YOUR DIAGNOSIS PLEASE: FEVER AND RASH IN MOTHER AND BABY

DENOUEMENT

During this time, his mother have been at home, one day after discharge, where she had recurrence of low to moderate grade fever (T: 37.7-38C), right leg swelling and joint pains. The attending pediatricians were then informed that the patient's mother was re-admitted and was managed accordingly as a case of Chikungunya. Further history revealed that the patient's father and two other members of their neighborhood had the same manifestations a week earlier, which resolved spontaneously.

Considering the clinical manifestations in our patient, as well as those in the mother, chikungunya PCR and IgM were requested as the diagnosis of neonatal chikungunya infection was entertained. Paired serum of both the patient and his mother were done for chikungunya serology IgM and PCR, and sent to the Research Institute for Tropical Medicine. This was the patient's 7th day of life, in where he manifested with episodes of bradycardia (heart rate 90-100 beats/min); no murmurs were noted. He was maintained on oxygen supplementation, his oxygen saturation via pulse oximeter remained >92%. CK-MB was requested and was slightly elevated 11 (N: 0-7.2ug/L). ECG and 2D-Echo were done and showed sinus arrhythmia and showed patent foramen ovale, respectively.

On his 8th – 10th day of life, no episodes of cyanosis were noted. Rashes and facial edema had gradually decreased. Peripheral edema had lessened, though more noticeable on his right lower extremity than the left. No crying/pain noted upon extension of his extremities. His heart rate remained between 98 – 117 beats/min, with regular rhythm and no murmurs appreciated. Oxygen saturation remained > 95% at O2 1 LPM, with good air entry and clear breath sounds. He remained afebrile, tolerates oral feedings at 40 - 60cc every 3 hours. Probiotics was started. Rest of his vital signs remained stable.

On his 11th- 12th days of life, he became more active with stable vital signs. There were no episodes of cyanosis; there was noted further decrease in the edema of right lower extremity. However, the left lower extremity had been persistently edematous. He was weaned off from oxygen, which he tolerated.

On his 13th day of life, only edema of his left foot remained. Desquamation was noticeable along his extremities and some along the trunk and abdominal area (Fig3). He remained active, with good oral milk intake and active motor movement. Meropenem and Amikacin were completed and consumed.

On his 14th day of life, vital signs remained stable. Chikungunya IgM and PCR results for both the patient and his mother came out and revealed reactive and positive for viral RNA, respectively (Table 2). Given that both PCR and IgM were positive, a final diagnosis of Neonatal Chikungunya was thereby established. Patient was subsequently been discharged with a final diagnosis of Neonatal Chikungunya with Viral Myocarditis, resolved.

DISCUSSION

Chikungunya is an arboviral disease caused by the Chikungunya virus which belongs to the genus alpha virus of the family Togaviridae. The virus is transmitted by mosquitoes of the genus Aedis (mainly A. aegypti and A. albopictus). The virus was first isolated in 1952 and is found in eastern Africa, India, and Southeast Asia [2]. Symptoms of infection are high fever and disabling muscle and joint pain, often associated with a rash and mild bleeding. Persons infected usually recover

spontaneously in several days to a week. Fever and arthralgia may occur for several months or even years. Patients are treated only for their symptoms because there is no specific treatment for the underlying infection.

Mother-to-child transmission was first reported in a study by Fritel, et al during the 2005-2006 outbreak on Reunion Island France. There were a total of 1400 pregnant women included in the study. Of the total, 705 (50%) reported chikungunya symptoms during pregnancy; 668 (48%) reported no symptoms, and 27 (2%) reported symptoms before pregnancy. Specific serologic tests confirmed the diagnosis of chikungunya infection for 658 (93%) of 705 who reported symptoms during pregnancy. Among the 658 women, infection occurred during the first trimester for 99 (15%) women, the second for 387 (59%), and the third for 172 (26%). Maternal signs and symptoms were fever (408 cases, 62%), arthralgia (615 cases, 93%), headache (354 cases, 54%), edema (355 cases, 54%), diarrhea (78 cases, 12%), aphthae (63 cases, 9.6%), epistaxis or gingivorrhagia (59 cases, 9%), and rash (496 cases, 76%).

In a study by Gerardin et al, vertical transmission of the infection was first documented. 7504 pregnant women were recruited and they gave birth to 7629 viable neonates. 678 of the mothers were infected during the antepartum and 61 pre- or intrapartum. The attack rate was 8.3% in pregnant women during the epidemic. This supports the transmission of infection during the birthing process with the infection probably occurring when free virus particles in maternal blood passively passed through breaches in the placental barrier. In addition, the time of greatest risk of transmission of virus from mother to fetus appears during birth if mother acquired the disease few days before delivery[7].

In our case, the mother presented with fever, maculopapular rashes on the trunk and abdominal area, leg swelling and joint pain who had a prior exposure with her husband and two other members of their neighborhood who also presented with the same symptoms. These symptoms seen one day prior to delivery may be suggestive of a possible chikungunya infection. The incubation period for the virus typically ranges from 2-4 days but can range from 1-12 days and viremia typically lasts 2-10 days. The classic triad of symptoms includes fever, arthralgia and rash distributed on the trunk, limb and face.

In the study of Ramful et al, clinical manifestations of chikungunya infection in the neonate were described. Total of 38 neonates were enrolled and all were symptomatic and presented symptoms on the third to seventh day of life. The mean interval between onset of maternal illness and onset of neonatal illness was 5 days. The most frequent clinical signs in the neonate were fever (79%), pain (100%), rash (82%), and peripheral edema (58%). Thrombocytopenia (76%), lymphopenia (47%), decreased prothrombin time (65%), and elevation of aspartate aminotransferase (77%) were detected. Our patient presented on the third day with low to moderate grade fever with eruption of multiple macular rashes on the trunk followed by edema in all extremities and joint pains manifested as crying whenever his extremities were extended. He was initially managed as a case of neonatal sepsis and was treated with a course of IV antibiotics based on these initial manifestations.

Chikungunya infections can be confirmed by the detection of the virus, viral RNA, or specific antibodies in patient samples. Blood test is the only reliable way to identify chikungunya since the symptoms are similar to much more deadly dengue fever. Viral RNA can be easily detected by reverse transcriptase-polymerase chain reaction (RT-PCR)

in serum specimens obtained from patients during the acute phase of infection. Enzyme-linked immunosorbent assays (ELISA) detect both anti-CHIKV immunoglobulin (Ig) M and IgG antibodies from either acute- or convalescent-phase samples.

Treatment of Chikungunya fever is symptomatic and supportive. Adequate fluid intake must be ensured. Paracetamol or nonsteroidal anti-inflammatory drugs (NSAIDS) may be used for symptom relief. Aspirin should be avoided due to its effect on platelets. Published evidence does not support the use of corticosteroids, antibiotics, or antiviral drugs in the management of Chikungunya fever, and indiscriminate use of these agents can be hazardous. Electrolyte imbalance, pre-renal acute renal failure, and bleeding manifestations should be watched carefully and managed accordingly.

Educating the community and public health officials, vector control measures such as elimination of breeding sites and spraying of insecticides should be initiated at the individual and community levels as this can be rewarding. Vector surveillance and control is a key element in containing Chikungunya fever epidemics. Active involvement of community and public health authorities with regard to hygiene and mosquito control measures is essential to stand a chance in the war against the mosquitoes.

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