

Neonatal Dengue Case Report

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Abstract

Dengue is an acute viral disease, exclusive to humans, caused by a Flavivirus of the Togaviridae family. Four variants of dengue are recognized; serotypes DEN 1, 2, 3 and 4. Dengue is a major health worldwide problem, with an estimated of 390 million infections in risk areas and 20,000 deaths from dengue each year. In Honduras, 90,487 cases have been reported in 2023, of which 1,200 are severe dengue and 34 of them ended up in deaths. A series of 3 cases of neonatal dengue were reported at the San Francisco General Hospital, Juticalpa, Honduras in the periods of June to December of 2019. It was possible to detect that the cases occur by vertical transmission, presenting in the first days of life. The clinical suspicion was confirmed with the positive NS1/IgM serological test. The newborns studied presented variable symptoms from asymptomatic with some laboratory alterations, and one of them presented pump failure but his resolution was satisfactory medical discharge. Is interesting notice that maternal clinical evolution is not directly proportional to the newborn. In endemic areas, neonatal dengue should be suspected whenever there are pregnant women with febrile acute illness. Preventing the spread of the mosquito is the most important pillar in reducing dengue cases in our area.

Keywords: dengue; endemic areas; vertical transmission; ns1; prevention

Introduction

Dengue is an acute viral disease, exclusive to humans, caused by a flavivirus of the Togaviridae family. It is transmitted through the bite of an infected Aedes mosquito and manifests itself in an endemic - epidemic manner in the tropical and subtropical regions of Africa, Asia, America [1]. The virus belongs to the Flaviviridae family and four variants are recognized: serotypes DEN 1, 2, 3 and 4. Infection by a serotype confers permanent immunity against that serotype and only for a few months against the rest of the serotypes [2]. Dengue is a major global health problem. An estimated 3 billion people live in areas at risk of dengue, and there are approximately 390 million infections (96 million of which are symptomatic) and 20,000 deaths from dengue each year [3]. With more than 11 million cases of dengue, Latin America and the Caribbean are currently reporting twice as many cases as in all of 2023. However, the fatality rate remains below 0.05 %. In Honduras, 90,487 cases have been reported, of which 1,200 are severe dengue and 34 of them are deaths [4]. Vertical transmission of dengue is rare, with an estimated prevalence of 1.6 to 10.5%. The latency

period of dengue is 3 to 25 days and more commonly 5 to 8 days. It is more common in endemic areas and can occur when the mother is infected in the third trimester of pregnancy [5]. The appearance of signs and symptoms in the newborn has been described, which can occur from nine hours after delivery to 11 days of extrauterine life, with the average being 3 to 4 days [6]. Dengue infection may be due to a vertical infection, with maternal history being important and, in the case of clinical suspicion, establishing the diagnosis with the detection of NS1 in serum from day 0 to 5 days after the onset of symptoms and IgM after this period [7]. Dengue presents a wide range of clinical manifestations from asymptomatic patients with petechiae, ecchymosis, bleeding of different entities, fever to shock. The newborn should always be considered as a patient with potential risk of serious complications.

Case description

A series of three cases of neonatal dengue is reported from the Neonatology area of the San Francisco General Hospital, of the Health Services of Olancho, Honduras, detected from June to December 2019.

Patient clinical data

Case	1	2	3

Sex	Male	Female	Female
Gestational age	39 weeks	38 weeks	38 weeks
maternal fever prior to birth	Two days of evolution; vomiting, arthralgia and myalgia. Non-severe dengue with no warning signs.	Fever of 4 days' duration; gingivorrhagia, rash, severe dengue Postpartum hemorrhage.	Fever of 3 days' duration, myalgias and arthralgias. Non-severe dengue without warning signs.
Patient evolution	Hypoactive day, thrombocytopenia, leukopenia, elevated transaminases, with pump failure supported with dobutamine.	Fever for 3 days, leukopenia. Rash appears on the 4th day. Without further alteration.	Fever for 3 days, poor suction, leukopenia, moderate thrombocytopenia, elevated transaminase, with satisfactory clinical evolution.
Maternal blood count on admission	Leu: 3.6, HTC: 30.2, PLT: 132,000 Ns1: positive	Leu: 10, HTC: 28.5 PLT: 40,000. Ns1: positive	Leu: 8 Htc: 35 Plt: 150 Ns1: positive
NS1	Positive	Positive	Positive
Blood culture	Negative	Negative	Negative
Resolution	High	High	High

Discussion

In 2019, an increase in dengue was observed globally. In Honduras, 112,708 cases were reported, of which 93,273 cases were dengue without warning signs and 19,453 cases were severe dengue, where 180 deaths occurred. The most affected departments were the Central District and Yoro. The increase in dengue transmission is due to social and environmental factors, population density, human mobility, access to reliable water and climate change [10]. In our hospital unit, 3 cases of vertical transmission have been reported, where dengue was suspected days before delivery based on maternal and clinical history. Clinical manifestations in newborns depend on the gestational age at which the mother developed the disease; consequences in the fetus have been observed such as intrauterine growth restriction and fetal death, which is explained by several pathophysiological mechanisms such as the increase in pro-inflammatory cytokines such as interleukins and tumor necrosis factor alpha (TNF-alpha) [11], where the production of uterine activating proteins is activated, thus triggering labor [12]. Additionally, thrombocytopenia and extravasation of fluid caused by dengue lead to injury to the placental circulation and hypoxia [13]. In the second and third trimester postpartum, vertical transmission occurs in the mother to her child, which manifests with a wide range of symptoms such as fever, petechiae, erythema, thrombocytopenia, leukopenia and hepatomegaly, in addition to nonspecific symptoms such as poor feeding tolerance and alterations in alertness [14].

Romero Sancruz describes 7 cases of neonatal dengue, where he describes that all cases presented with leukopenia, thrombocytopenia and fever, which were reported on the third or fourth day after birth; others presented with liver failure, kidney failure, thrombocytopenia, and there were no deaths. Infants who contract the disease may present variable clinical manifestations, depending on whether they acquired IgG antibodies from their mother, which neutralize the dengue virus, so the manifestations are mild or the patient is asymptomatic. Normally this protection decreases at 6 months of age due to IgG clearance. The three cases described in the hospital presented leucopenia in their complete blood count and 2 of them had significant thrombocytopenia, in addition to fever in all 3 cases and in one of them the rash was observed on the fourth day. One of them presented signs of hypovolemic shock, so the water protocol recommended by the WHO was implemented, where it was necessary to use vasoactive amines with dobutamine due to significant bradycardia, which was followed for 4 days, without requiring blood products or plasma. This patient remained hospitalized for 10 days in the neonatal unit, with medical discharge. The symptoms of dengue in newborns are nonspecific and can be confused with bacterial sepsis, so it should always be suspected, especially in endemic areas and when the mother has an acute febrile illness. In this report, the mothers and their children had positive serological tests for dengue [15]. One of the approaches to prevent dengue infection is to control the vector that transmits it. In the case of congenital dengue, the main objective would be to avoid

maternal infection, using the same tools as in the general population. This includes eradicating possible breeding sites by avoiding stagnant water, using repellents and also using insecticides to reduce the population of *A. aegypti*, among others [17].

Conclusion

In our environment, dengue is one of the most common endemic diseases, which represents great challenges for public health. With the increase in cases in pregnant women, vertical transmission must always be suspected in order to make a timely diagnosis and manage the disease in the newborn, since the manifestations can be so variable, from being asymptomatic to organ failure, which without timely treatment would have fatal outcomes. It must be taken into consideration that the severity of the mother is not directly proportional to the severity of the newborn or vice versa, which is why the importance of timely diagnosis for proper management of the patient is emphasized. Prevention remains the pillar in the management of the disease, since in this way we will have a considerable decrease in dengue cases in our country.

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