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DENGUE TYPE 2 OUTBREAK IN THE SOUTH OF THE STATE OF BAHIA, BRAZIL: LABORATORIAL AND EPIDEMIOLOGICAL STUDIES

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SUMMARY

During March 1994 cases of a exanthematic acute disease were reported in the municipalities of Itagemirim, Eunápolis and Belmonte, state of Bahia. Dengue fever was confirmed by serology (MAC-ELISA) and by dengue virus type 2 isolation, genotype Jamaica. Signs and symptoms of classic dengue fever were observed with a high percentual of rash (73.8%) and pruritus (50.5%). Major haemorrhagic manifestations were unfrequent and only bleeding gum was reported. Dengue virus activity spreaded rapidly to important tourism counties like Porto Seguro, Ilhéus, Santa Cruz de Cabrália, Prado, Alcobaça and others, representing a risk for the spreading of dengue virus into the country and abroad.

KEYWORDS: Dengue virus type 2; Outbreak; Bahia.

INTRODUCTION

After dengue virus type 1 (DEN-1) epidemic in the state of Rio de Janeiro in 1986 dengue virus activity was observed along east coast of Brazil [9, 10]. Dengue fever epidemics occurred mainly in the states of Alagoas and Ceará, although other states as Pernambuco and Bahia also reported small outbreaks. Since then cases of dengue fever have been reported annualy in the states of Alagoas and Ceará. In both states, four years after DEN-1 introduction dengue virus type 2 (DEN-2) was also isolated reproducing the epidemiological situation of the state of Rio de Janeiro in 1990-91 [8, 11].

In the state of Bahia dengue activity was detected in 1987 as a localized outbreak in the municipality of Ipupiára where 623 cases were reported [3]. Although 108 of 336 municipalities of the state were positive for *Aedes aegypti* during this period, measures to vector control was soon implemented and the transmission was interrupted. During the following six years no cases of dengue infection were reported in the whole state [3].

This report presents virological and epidemiological aspects of dengue fever outbreak occurred in the south of the state of Bahia in 1994.

MATERIAL AND METHODS

Serum specimens were obtained from 1120 patients suspected of dengue infection. Acute and convalescent sera were collected by veinpuncture and delivered to LACEN in Salvador for serological confirmation by MAC-ELISA test [6]. All virus isolations were carried out at the Department of Virology, Oswaldo Cruz Foundation in Rio de Janeiro. Acute sera were diluted 1/10 in Leibovitz medium (L - 15) and inoculated on monolayers of C6/36 clone of *Aedes albopictus* cells supplemented

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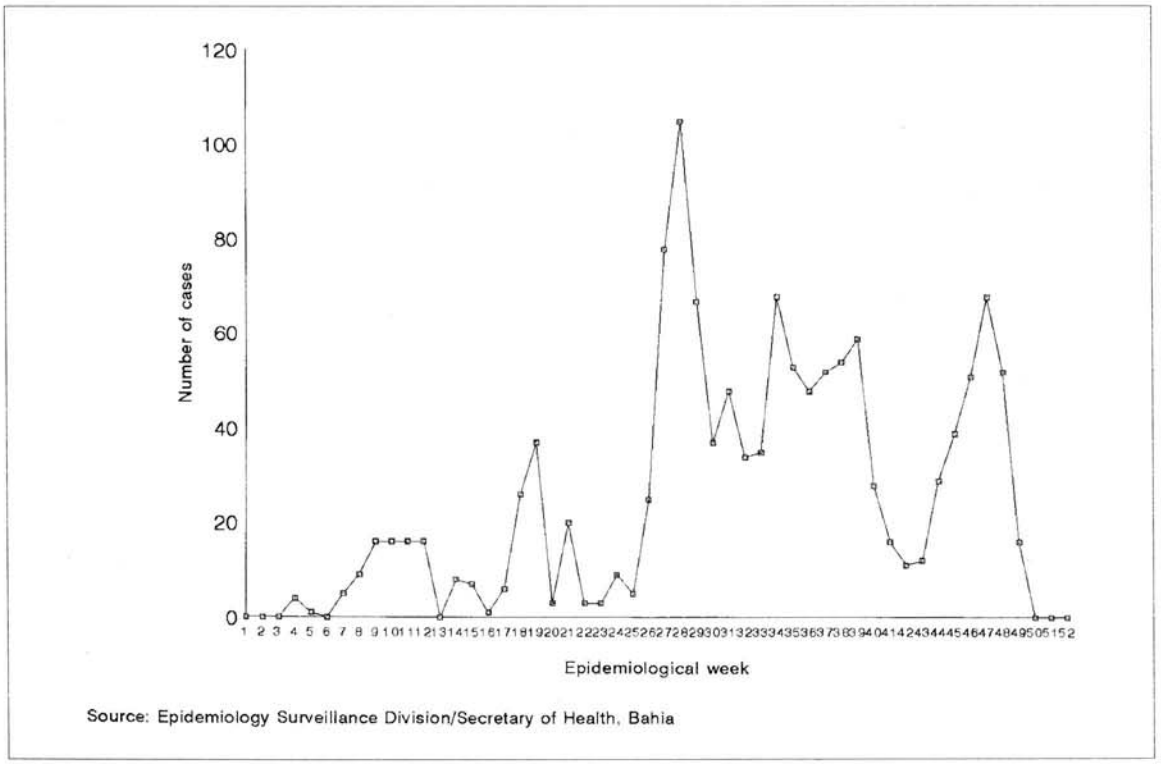

Fig. 1 - Dengue reported cases by epidemiological week during dengue type 2 epidemic in the South of Bahia, 1994.

with 1% non-essencial aminoacids, 10% tryptose phosphate broth and 2% inactived fetal calf sera. Dengue virus were type-identity confirmed by indirect immunofluorescence tests using monoclonal antibodies [4].

The haemagglutination inhibition test (HI) was carried out according CLARKE & CASALS (1958) [2], adapted to microtiter plates.

RESULTS

Virological and serological results

DEN-2 virus was isolated from 6 out of 186 acute specimens inoculated. MAC-ELISA showed positivity in 27.8% (312/1120) of the studied cases. HI antibodies to DEN-1 and DEN-2 viruses in 33 patients showed higher titers and sometimes specific response to DEN-2 antigen. In five cases a secondary response was detected, with HI antibodies titers ranging from 2560 to 10240.

Epidemiological and clinical findings

Between 10th and 16th epidemiologic week of 1994 the Epidemiological Surveillance Division at the Secretary of Health, state of Bahia noticed an increasing of rubella-like cases, in the municipalities of Itagimirim, Belmonte and Eunápolis. From 27 sera sample collected from these cases no anti-rubella IgM and IgG were detected. Then, IgM capture test (MAC-ELISA) was applied and two of them showed specific positive results for DEN-2 antigen. Figure 1 shows the distribution of dengue reported cases by epidemiological week during 1994. Dengue cases were soon confirmed by serology and/or virus isolation on other municipalities in south region of the state (Table 1).

Clinically, dengue cases were characterized by fever, headache, rash, arthalgia, myalgia, retroorbital pain, pruritus and asthenia. Figure 2 shows signs and symptoms in 107 dengue confirmed cases by virus isolation and/or MAC-ELISA.

DISCUSSION

In spite of several dengue epidemics in Brazil, to recognize dengue virus as an aetiologic agent of exhantematic disease is still troublesome. The explosive

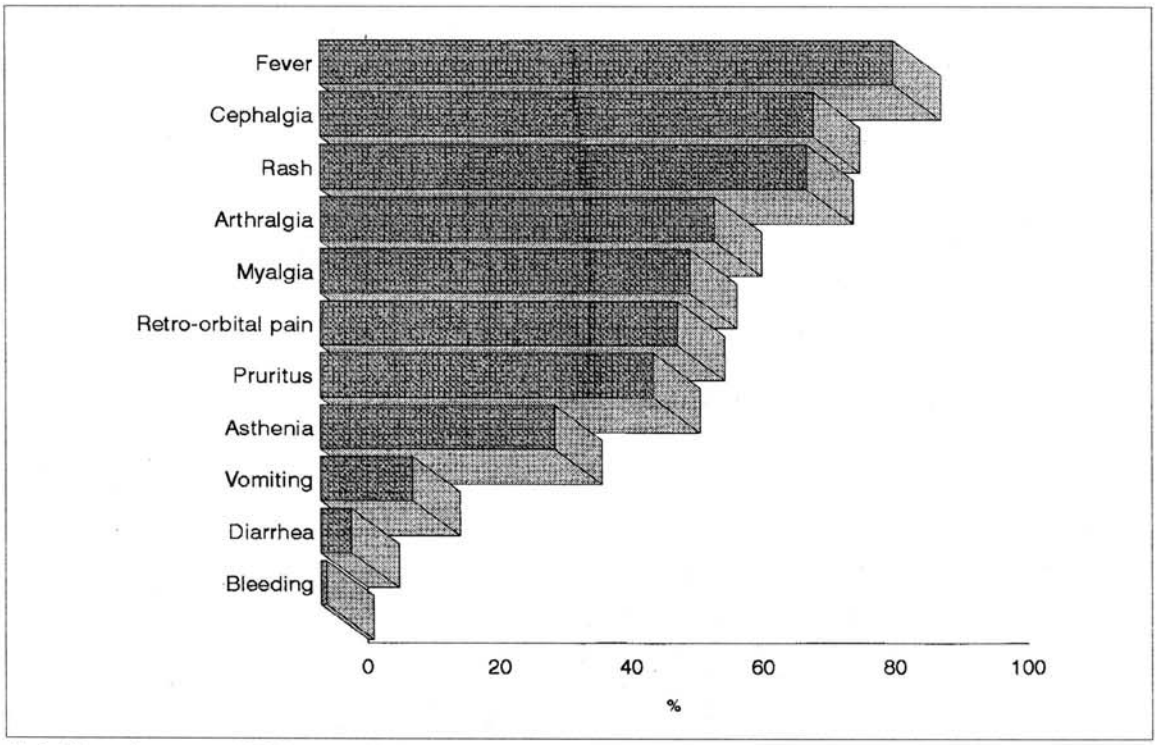

Fig. 2 - Signs and symptoms of 107 dengue confirmed cases in the South of Bahia, 1994.

TABLE 1

Distribution of dengue reported cases by municipalities, 1994.

Municipalities	Number of cases
Alcobaça	13
Belmonte	73
Caravelas	63
Eunápolis	340
Guaratinga	9
Ilhéus	581
Itabela	144
Itabuna	1
Itagimirim	89
Itamarajú	53
Porto Seguro	10
Prado	28
Santa Cruz de Cabrália	38
Teixeira de Freitas	74

Source: Epidemiology Surveillance Division/Secretary of Health, Bahia.

character and the presence of the vector *Aedes aegypti* in one region must to be considered as dengue at least as an differential diagnosis. Many times rubella diagnosis has been done in clinical grounds, mostly when fever is not so high as usually expected in dengue cases. Consequently, differential diagnosis by laboratorial tests are definitive to characterize the causal agent. A rapid laboratory confirmation of dengue cases should be achieved through improvement and expansion of the network laboratories able to carry on at least the serological confirmation by MAC-ELISA test.

The high percentual of rash in that outbreak and a lack of handling dengue fever by the local physicians, misleads dengue fever diagnosis. Analysing epidemiological bulletins, 4 cases of rubella were even reported on 4th epidemiological week in Itagimirim. At 27th epidemiological week 203 cases of rubella were still notified. A percentual of rash (73.8%) and pruritus (50.5%) were observed, higher than in DEN-2 epidemic in the state of Rio de Janeiro, 35.7% and 21.4% respectively [7]. Haemorrhagic manifestations were unfrequent and only bleeding gum was reported.

Although no dengue cases were reported in that area before, serological evidence for well documented

secondary infection was observed in 5 from 33 patients, showing previous contact with other flavivirus.

Rapid spreading in surroundings counties was a characteristic of this outbreak, since until the 26th epidemiological week, only 4 municipalities had dengue cases and at 27th week 11 municipalities had already reported dengue cases.

Porto Seguro, Prado, Santa Cruz de Cabrália and Ilhéus far about 700 Km from Salvador are important tourism areas in the northeast of Brazil. That area received along the year, specially in summer, people from several parts of the country and as well as foreigners. This point should be considered due to the presence of dengue activity in 17 states in Brazil, representing about 2/3 of the country, with a high risk of the introduction of dengue virus types 1 and 2 in all of them in the very next future.

The low rate of virus isolation could be explained by the difficulties of keeping sera in proper conditions and due to a long distance before reaching the laboratory. Dengue virus isolation is very important to determine the origin of strain and the impact on population. The sequencing of strains isolated during this outbreak confirmed Jamaica genotype (Miagostovich, unpublished data). This DEN-2 genotype seems to have a greater potential to cause severe disease than Porto Rico prototype and may be cause for concern in those areas in which high rates of antibody to DEN-1 predispose populations to severe disease [1, 5].

RESUMO

Surto de dengue tipo-2 no sul do estado da Bahia, Brasil: estudos laboratoriais e epidêmicos

Em março de 1994, casos de uma doença exantemática foram notificados nos municípios de Itagimirim, Eunápolis e Belmonte, sul da Bahia. Infecção por dengue foi confirmada por sorologia (MAC-ELISA) e pelo isolamento de virus dengue tipo 2 (genotipó Jámaica). Sinais e sintomas de dengue clássico foram observados com um alto percentual de exantema (73,8%) e prurido (50,5%). Manifestações hemorrágicas não foram importantes e apenas casos de gengivorragia foram descritos. A atividade dos virus dengue espalhou-se rapidamente para importantes áreas de turismo da região, tais como Porto Seguro, Ilhéus, Santa Cruz de Cabrália, Prado, Alcobaça e outros, representando um risco da dispersão do virus para outras regiões do país e exterior.

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