



DISTRIBUTION OF BLOOD GROUP TYPE IN DIAGNOSED NS1 Ag POSITIVE DENGUE PATIENTS IN HYDERABAD, TELENGANA STATE, INDIA.

Pathology

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ABSTRACT

The aim of this study was to determine the distribution of blood group type in diagnosed NS1 Ag positive dengue cases. The ABO phenotypes were identified by use of blood from patients with dengue virus infection prospectively, in newly diagnosed patients at a tertiary care hospital in south India. A total of 162 NS1 Ag positive cases were collected with dengue illness. The greatest number (25%) of dengue cases were seen in the 11-20 year age group. Males were predominantly effected(58%).It was found that majority(45%) of cases belonged to blood group O.

KEYWORDS

Dengue fever, NS1 antigen, Blood groups.

INTRODUCTION:

Dengue fever is a tropical disease caused by Dengue virus belonging to family Flaviviridae, an Arthropod borne disease. Virus is widely distributed throughout the world in tropics and subtropics [1]. Aedes egypti, the urban yellow fever mosquito is the principal vector [2]. Four stereotypes of virus exist referred to as DEN-1, DEN-2, DEN-3, DEN-4 [3]. DV is positive stranded encapsulated RNA virus composed of 3 genes coding for core protein(C), a membrane (M) protein, envelope(E) protein and 7 non-structural(NS) protein[4].All the four stereotypes can cause full spectrum of diseases ranging from dengue fever to fatal dengue hemorrhagic fever.

The blood group ABO antigens are carbohydrate in nature; the immune dominant sugar in the case of the A determinant is N-acetyl-D-galactosamine, and that in the case of the B determinant is D-galactose. Galactosyltransferases are involved in the synthesis of these carbohydrate[5]. The antibody that recognizes these carbohydrates is primarily natural IgM. Interestingly, several dengue viral proteins have been shown to be glycosylated, and antibodies, particularly IgM, produced in patients with dengue-virus infection have been shown to cross-react with host cells [6]. Therefore, the results of present study suggest that blood O is the risk factor for dengue infection. It is also the most frequent position of ABO blood group system among the blood donors in Hyderabad, Telengana state, India[7].

MATERIALS AND METHODOLOGY

The study was carried over one year (May2018toJune2019), 162 NS1Ag positive subjects were studied. The data collected included date of admission, age, gender, laboratory investigations. Prospective cases were patients attending outpatient department and patients admitted for dengue. According to the protocol of the hospital, samples for the blood group testing were sent from all the diagnosed dengue patients. Blood samples were collected under aseptic precautions by venipuncture from children and adults with acute febrile illness [8]. Serum was separated by centrifuging samples at 3000 rpm for 5 minutes and tested using tube method. In tube method, three test tubes labeled as A,B,O containing patients serum,one drop of commercially available antisera A, antisera B were added to the respective tubes and checked for agglutination and results were noted. All the samples showing O blood group with agglutination were tested for Bombay blood group by slide and tube methods.In slide method,one drop of commercially available anti-H and negative control normal saline) were placed on slide,mixed and checked for agglutination.In tube method,one drop of anti-H lectin and one drop of 5% redcell suspension,washed in isotonic saline solution were mixed,shaken to homogenize, centrifuged and checked for agglutination under microscope. Standard hemagglutination assay were used to type the blood groups. The standard method we use is the test tube method not the slide method. Data of 162 samples was compiled in Microsoft Excel.

To minimize the risk of infection, safe laboratory techniques (i.e. use of personal protective equipment, appropriate containers for collection and transportation of samples, etc.) were practiced as described in WHO's laboratory biosafety manual [9]. Acute dengue-virus infections were diagnosed (by ELISA and NS1+ Ag test) [10].

RESULT

Table-1: Percentage distribution of dengue among Male and Female

Sex	Number of individuals Affected	% of individuals Affected
Female	67	42%
Male	95	58%
Total	162	100%

Table 1 : shows the gender distribution of dengue patients under study. 95 case were male(58%) and 67(42%) females were affected with dengue illness. Hence males are more affected than females.

Table-2 : Age distribution of dengue illness.

Age group	Number of individuals affected	% of affected Individuals
0-10	37	23%
11-20	41	25%
21-30	39	24%
31-40	19	12%
41-50	9	6%
51-60	8	5%
61-70	7	4%
71-80	1	1%
91-100	1	1%
Total	162	100%

Table -2 shows age distribution of dengue infection. Majority of dengue illness were between the age group of 11-20 years(25%), followed by 21-30 years(24%) and 0-10 years(23%).

Table-3: Distribution of dengue among different blood group and Rh types.

ABO & Rh type	Number of cases	Percentage of individuals Affected
A+ve	12	7%
A-ve	0	0%
B+ve	59	37%
B-ve	3	2%
AB+ve	12	8%
AB-ve	0	0%
O+ve	72	44%

O-ve	4	2%
Bombay	0	0%
Total	162	100%

Table-3 depicts distribution of dengue among different blood groups and Rh type. It was found that o blood group was predominant, followed by B (38%) and A (7%).

DISCUSSION

Dengue fever, an acute febrile arbo-viral disease has become a major public health problem in tropical and subtropical regions of the world, especially in India. Hence, a clinical study of the dengue cases was done to analyze the blood group at risk and prevent the disease. The results of the present study suggest that blood group O may be a risk factor predisposing for dengue disease.

In studies carried out by Kalayanaurooj *et al* [11] and Khode *et al.*, [12] O blood group was the predominant, hence this finding was comparable with the present study. Hence people with Type O blood are found to be more attractive to mosquitoes than those with Type A blood. Also, blood group O distribution was consistent with Indian population which could have been a confounding factor. Studies in the Southern India described 'O' as the most frequent and 'B' as the second most common blood group [13] [14] [15] [16]. Studies confirmed that O group is the most frequent position of ABO blood group system among the blood donors in Hyderabad, Telangana state, India [7].

In studies carried out by Attiya *et al* [17], Ashraf Khaskheli *et al* [18] and Nadeem Afraz *et al* [19], stated that males were effected more than the females. The results of these studies were similar to the present study. Male gender was predominant which may be attributed to the fact that in Asian culture, males spend more time outside their houses and thus are more likely to be exposed when compared to females [20], [21]. Also there has been a growing recognition that biological differences between male and female based on genetic, immunological and hormonal factors, may determine the susceptibility to disease and clinical outcome, including for dengue infection. [22], [23]. Females may mount a more vigorous immune response to infection than males [24].

Therefore, the results of the present study suggest that blood group O is the risk factor.

Because of the limitations of the sample size in the present study, further studies may be conducted during subsequent dengue season to determine whether dengue and ABO are independent variables and severity of dengue in relation to blood groups needs to be assessed.

CONCLUSION AND SUGGESTIONS:

- Blood group O individuals must exercise extra caution compared to the general population since O group are more prone to develop dengue.
- Personal prevention consists of reducing the outdoor time and hence preventing the exposure to mosquitoes. Use of mosquito nets on windows, repellants, use of DEET-impregnated bed nets, and avoiding endemic areas. Avoiding stagnation of water around the house. Application of larvicides to items such as buckets, gutters, septic tanks etc.

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