

Ocurrence of Neutrophil Left Shift in Dengue Haemorrhagic Fever *

E. Villegas, N. Villegas, A.J. Rodriguez-Morales.

Instituto Experimental José Witremundo Torrealba, Universidad de Los Andes, Trujillo, Venezuela.

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Resumen

El uso de la neutrofilia o desviación a la izquierda en la formula Blanca, en el diagnóstico de enfermedades infecciosas e inflamatorias ha sido evaluado en estudios previos, indicando que los cambios morfológicos en los neutrófilos, tienen tanto una alta especificidad (contaje de bandas) en predecir algunas enfermedades infecciosas y por ende ser clinicamente utiles. Por estas razones se evaluaron las características clínicas y el contaje anormal de bandas de neutrófilos (>3%) en pacientes con diagnóstico de dengue (FD) y dengue hemorrágico (DH). En este estudio se evaluaron 48 pacientes (54,2% hombres), 39,58% <15 años de edad. Sus características clínicas fueron: 100% presentaron fiebre y cefalea, 83,3% mialgia, 64,6% hematemesis (78,4% en aquellos con DH y 22,2% en FD, $p < 0.01$), 60,4% epistaxis, equimosis solo en aquellos con DH (10,8%), 47,9% dolor abdominal (59,5% en aquellos con DH y 11,1% en FD, $p = 0.03$) y hepatomegalia solo en DH (29,2%). Las alteraciones hematológicas fueron: hemoconcentración y trombocitopenia (solo en aquellos con DH, 83,8% para ambas), 18,8% leucopenia, 29,2% linfocitosis, linfocitos atípicos (solo en DH, 40,5%), 68,8% monocitosis, y tiempos de coagulación prolongados, solo en DH (59,5% para PT y 67,6% para PTT). Finalmente, el contaje incrementado de bandas de neutrófilos se observó exclusivamente en pacientes con DH (en 45,9%). Algunos estudios han indicado que estos contajes pueden ser usados como indicador de agudeza en el dengue. Adicionalmente, las evidencias indicant que el nadir de neutrófilos ocurre en 4to a 5to día después del inicio de la fiebre, y en algunos casos la supresión medular inducida por el virus dengue también ha sido sugerida. En todo caso, su utilidad debe ser mas estudiada.

Palabras claves: dengue, dengue hemorrágico, formula blanca, neutrofilia. *Rev Soc Med Quir Hosp Emerg Perez de Leon* 2003; 34(1-2):6-8.

Abstract

Use of neutrophil left-shift parameters in the diagnosis of inflammatory and infective disease has been evaluated previously in some studies, indicating that morphologic changes in neutrophils, either have a high specificity (band count) in predicting some infectious diseases and therefore may be a clinically useful tool. For these reasons we evaluated clinical features and the anormal neutrophil band count (>3%) in patients with diagnosis of dengue (FD) and dengue haemorrhagic fever (DHF). In this study 48 patients (54.2% male), 39.58% were <15 y-old. Clinical features were: 100% presented fever and cephalgia, 83.3% myalgia, 64.6% hematemesis (78.4% in those with DHF and 22.2% in DF, $p < .01$), 60.4% epistaxis, equimosis only in those with DHF (10.8%), 47.9% abdominal pain (59.5% in those with DHF and 11.1% in DF, $p = .03$) and hepatomegaly only in DHF (29.2%). Hematological alterations were: hemoconcentration and thrombocytopenia (only in those with DHF, 83.8% for both), 18.8% leucocytopenia, 29.2% lymphocytosis, atypical lymphocytes (only in DHF, 40.5%), 68.8% monocytosis, and elapsed coagulation times, only in DHF (59.5% for TP and 67.6% for TTP). Finally, increased neutrophil band count was observed exclusively in those with DHF (in 45.9%). Some studies in Thailand have indicated neutrophil counts could be used as acute dengue illness indicator. Additionally, evidences indicated that neutrophil nadir occurrence on the 4th to 5th day after onset of fever, and in some cases dengue virus-induced marrow suppression has been suggested. Another related aspect is the neutropenia and thrombocytopenia in DHF, which has been explained in part due to the increased binding of neutrophil and platelet to endothelial cell. However, further deep research is expected.

Key words: dengue, haemorrhagic dengue, WBC formula, neutrophilia. *Rev Soc Med Quir Hosp Emerg Perez de Leon* 2003; 34(1-2): 6-8.

Introduction

Use of neutrophil left-shift parameters in the diagnosis of inflammatory and infective disease has been evaluated previously in some studies, indicating that morphologic changes in neutrophils, either have a high specificity (band count) in predicting some

infectious diseases and therefore may be a clinically useful tool¹⁻⁸.

Methods

For these reasons we evaluated clinical features and the anormal neutrophil band count (>3%) in patients with diagnosis of

dengue (DF) and dengue haemorrhagic fever (DHF).

Dengue diagnosis was initially clinical and epidemiological, then serologically confirmed.

Clinical classification was made according international criteria in DF and DHF.

Results

In this study we evaluated 48 patients with dengue: the sex distribution was: 54.2% male and 45.8% female (NS differences between DF and DHF groups), being in the age distribution 39.58% <15 y-old.

In this group of patients, in those whose developed DF 11.1% has had previous dengue infections, and those with DHF only 2.7% referred this.

The clinical features of these patients were:

- 100% presented fever and 100% cephalaea,
- 83.3% myalgia,
- 64.6% hematemesis (78.4% in those with DHF and 22.2% in DF, $p < 0.01$),
- 60.4% epistaxis, equimosis only in those with DHF (10.8%),
- 47.9% abdominal pain (59.5% in those with DHF and 11.1% in DF, $p = 0.03$)
- and hepatomegaly only in DHF (29.2%) (Figure 1).

Other clinical complains in these patients were ostemuscular pain (83.33% with NS differences), skin eruptions (29.73% in DHF and 11.1% in DF), vomiting (51.35% in DHF and 44.4% in DF).

About the hematological alterations, these were:

- hemoconcentration and thrombocytopenia (only in those with DHF, 83.8% for both),
- 18.8% leucocytopenia (21.62% in DHF and 11.1% in DF),
- 29.2% lymphocytosis (35.14% in DHF and 11.1% in DF), with atypical lymphocytes (only in DHF, 40.5%),
- 68.8% monocytosis (72.97% in DHF and 66.67% in DF), and
- elapsed coagulation times, only in DHF (59.5% for TP and 67.6% for TTP).

Finally, increased neutrophil band count was observed exclusively in those with DHF (in 45.9%) (Figure 2).

Figure 1. Clinical features observed in those patients with DF and DHF in our study.

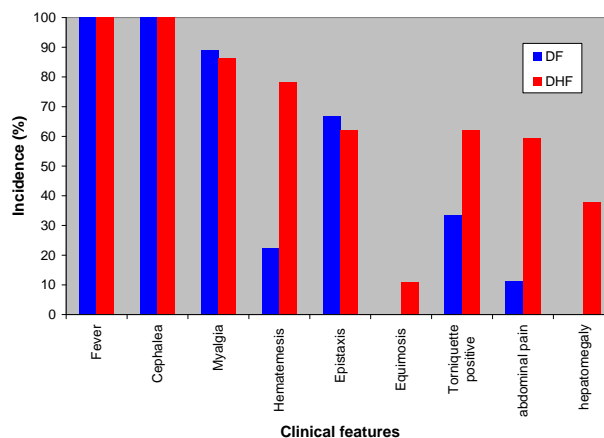
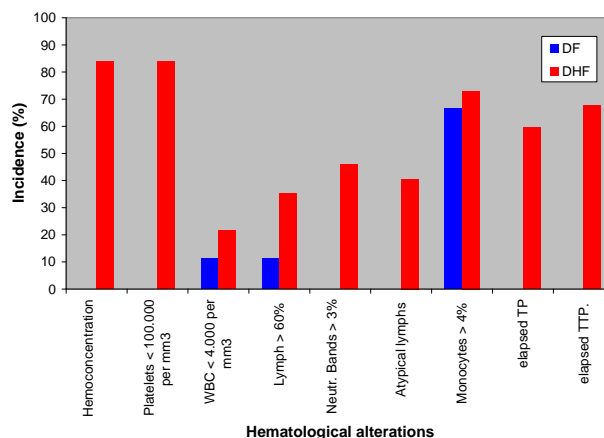


Figure 2. Hematological alterations observed in those patients with DF and DHF in our study.



Discussion

Some studies in Thailand have indicated neutrophil counts could be used as acute dengue illness indicator^{1,2}.

Additionally, evidences indicated that neutrophil nadir occurrence on the 4th to 5th day after onset of fever, and in some cases dengue virus-induced marrow suppression has been suggested³⁻⁵.

Another related aspect is the neutropenia and thrombocytopenia in DHF, which has been explained in part due to the increased

binding of neutrophil and platelet to endothelial cell⁴⁻⁸.

In the case of neutropenia, some studies have indicated that IL-8 levels are increased in most patients with dengue virus infection and correlate with degranulation of neutrophils as well as with some clinical and hemodynamic variables, suggesting a role for IL-8 in the pathogenesis of dengue virus infection³.

Validation and usefulness of these results should be further and deeply investigated.

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Corresponding Author: Alfonso J Rodriguez Morales, email: ajrodriguezmd_md@hotmail.com.

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