**Original Article**

# A Prospective Study on Effect of High Dose of Steroid on Platelet Count in Acute Stage of Dengue Fever with Thrombocytopenia

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## Abstract

**Background:** Dengue was the second disease after "yellow fever" that was shown to be caused by virus. The present study was conducted to assess effect of steroid on platelet count in acute stage of dengue fever. **Subjects and Methods:** 112 patients of dengue fever were divided into 2 groups. Group I was prescribed intravenous dexamethasone 8 mg initially followed by 4 mg every 8 hours thereafter for 4 days and group II patients was given only IV fluids and antipyretics. **Results:** Group I had 30 males and 26 females and group II had 25 males and 27 females. The mean platelet count (thousands) in day 1 was 29846.8 and 32442.4 in group I and group II respectively, on day 2 was 56003.4 and 44284.6, on day 3 was 78012.6 and 74224.6 and on day 4 was 126124.8 and 114620.4. The difference between both groups was non- significant (P> 0.05). **Conclusion:** High dose dexamethasone regimen was not effective in achieving a higher rise in the platelet count in the acute stage of dengue fever.

**Keywords:** Dexamethasone, dengue, Platelet.

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## Introduction

The origin of word "dengue" is derived from the Swahili phrase ka-dinga pepo which describes the disease is being caused by an evil spirit.[1] In 1906, Aedes mosquitoes transmitting the dengue fever was confirmed and in 1907, Dengue was the second disease after "yellow fever" that was shown to be caused by virus. Dengue is believed to infect 50 to 100 million people worldwide in a year. The mortality is 1-5% without treatment and less than 1% with treatment.[2] Severe disease carry a mortality of 26%. The incidence of dengue in increased 30 fold between between 1960 and 2010. This increase is believed to be to be due to multiple factors like, rapid urbanization, population growth, increase is believed international travel from endemic areas and lastly global warming. The geographical distribution is around the equator mainly affecting Asia and pacific regions.[3]

Thrombocytopaenia is a constant manifestation in dengue fever, which often leads to life threatening Dengue hemorrhagic Fever (DHF) and the dengue shock syndrome (DSS). Both haemorrhagic diathesis and circulatory collapse are the fatal complications of the dengue infection. Thrombocytopaenia and bleeding tendencies are the common problems in

dengue, which cause concern for the patients and the treating doctors.[4]

Steroids are used in the treatment of idiopathic thrombocytopaenic purpura to increase the platelet count, which is mediated by auto antibodies. This hypothesis would support the use of steroids in dengue fever.[5] The present study was conducted to assess effect of steroid on platelet count in acute stage of dengue fever.

## Subjects and Methods

The present study comprised of 112 patients of dengue fever of both genders. All enrolled patients were made aware of the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. A though history and clinical examination was performed. The patients were screened for dengue NS1Ag, IgG ELISA, IgM ELISA. Patients were divided into 2 groups of 56 each. Group I was prescribed intravenous dexamethasone 8 mg initially followed by 4 mg every 8 hours thereafter for 4 days and group II patients was given only IV fluids and antipyretics. Platelet count, temperature, pulse, BP, weight, fluid intake

output chart, oedema, haematocrit value, blood glucose and electrolytes were determined daily. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## Results

**Table 1: Distribution of patients**

| Groups | Group I | Group II |
|--------|---------|----------|
| M:F | 30:26 | 25:27 |

[Table 1] shows that group I had 30 males and 26 females and group II had 25 males and 27 females.

**Table 2: Comparison of mean platelet count (in thousands)**

| Days | Group I | Group II | P value |
|------|---------|----------|---------|
| 1 | 29846.8 | 32442.4 | 0.12 |
| 2 | 56003.4 | 44284.6 | 0.87 |
| 3 | 78012.6 | 74224.6 | 0.91 |
| 4 | 126124.8 | 114620.4 | 0.14 |

[Table 2, Figure 1] shows that mean platelet count (thousands) in day 1 was 29846.8 and 32442.4 in group I and group II respectively, on day 2 was 56003.4 and 44284.6, on day 3 was 78012.6 and 74224.6 and on day 4 was 126124.8 and 114620.4. The difference between both groups was non-significant (P> 0.05).
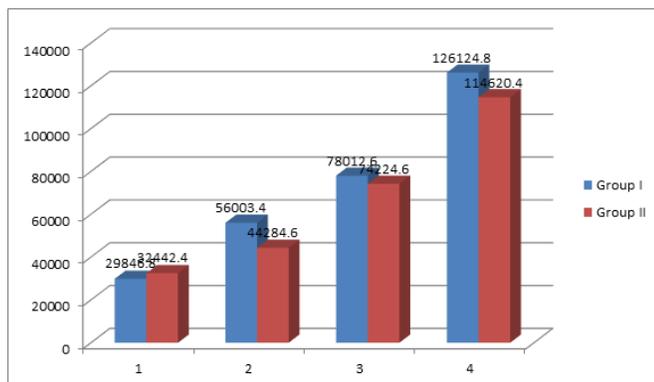


**Figure 1: Comparison of mean platelet count (in thousands)**

## Discussion

Dengue is a disease caused by any one of closely related dengue viruses (DEN1, DEN 2, DEN 3 & DEN 4). The viruses are transmitted to human by the bite of an infected mosquito, Aedes Aegypti but 2001 outbreak in Hawaii was transmitted by Aedes Albopictus. The Asian genotypes of DEN-2 and DEN-3 are frequently associated with severe disease. Dengue virus is a RNA virus of the family flaviviridae; they are otherwise called arboviruses. The dengue virus genome contains 11,000 nucleotide bones.[6] They have 3 different protein molecules that form virus partied (C, prM and E) and 7 other types of protein molecules (NSI, NS2a, NS2b, NS3, NS4a, NS4b, NS5) that are found in infected host cells and are required for replication of virus. There are 4 strains of virus, ex; DEN1, DEN2, DEN3, DEN4. ALL 4 serotypes can cause full blown disease. Infection with 1 serotype is believed to produce lifelong immunity to that serotype, but he can be infected with other serotypes in future.[7] The present study was conducted to assess effect of steroid on platelet count in acute stage of dengue fever.

In present study, group I had 30 males and 26 females and group II had 25 males and 27 females. Shashidhara et al,[8] determined whether an intravenous high dose dexamethasone was efficacious in increasing the platelet count in acute stage of dengue fever with thrombocytopenia. Methods: During the study period between June 2010 - 2011 in JSS Hospital Mysore, 127 patients were screened for dengue fever with thrombocytopenia. The baseline data age, sex, and the mean duration of the illness, Hb%, haematocrit, and platelets were similar in both the groups. The analysis of variance (ANOVA) statistics showed a significant linear association of the mean platelet counts with the days in either group. The mean platelet counts increased steadily in both the groups from days 1 to 4: day 1 (0.687), day 2 (0.34), day 3 (0.530) and day 4 (0.844). There was no significant difference between the two groups.

We found that mean platelet count (thousands) in day 1 was 29846.8 and 32442.4 in group I and group II respectively, on day 2 was 56003.4 and 44284.6, on day 3 was 78012.6 and 74224.6 and on day 4 was 126124.8 and 114620.4. Panpanich R et al,[9] observed an increased mortality after the use of steroids in DSS and DHF and opined that it was difficult to conduct a study on life threatening illnesses like DSS and DHF, as steroids would have compounding effects on the outcome of the disease. Sam Kularathne et al,[10] used low dose dexamethasone ie 4mg initially, followed by 2mg q 8 hours for 4 days in dengue fever with thrombocytopaenia (platelets less than 50000/cumm) in a placebo controlled study and concluded that it was not effective in increasing the platelet count. They advised to conduct similar studies using high dose dexamethasone.

The critical phase, if it occurs, follows the resolution of the high fever and typically lasts one to two days. During this phase there may be significant fluid accumulation in the chest and abdominal cavity due to increased capillary permeability and leakage.[11] This leads to depletion of fluid from the

circulation and organs. During this phase, organ dysfunction and severe bleeding (Typically from the gastrointestinal tract) may occur. Shock and hemorrhage occur in less than 5% of all cases of dengue but those who have previously been infected with other serotypes of dengue virus ("Secondary infection") have an increased risk of this.[12]

## Conclusion

Authors found that high dose dexamethasone regimen was not effective in achieving a higher rise in the platelet count in the acute stage of dengue fever.

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