SUMMARY

In India, dengue infection is one of the leading cause of morbidity and mortality. A progressive increase in the number and severity of cases of dengue poses a need for the early diagnosis of dengue infection. Considering the constraints in obtaining more specific laboratory support such as virus isolation, molecular diagnosis or detection of viral antigen, in the present study, it was aimed to identify haematological and biochemical markers which do not require much sophisticated laboratory for the diagnosis of dengue infection. For this purpose, a two year cross-sectional study was conducted in Salem, Tamilnadu, where dengue cases are reported every year. The study population included 254 dengue probable patients, 50 patients with OFI and 50 healthy persons as control group.

Blood samples were collected from the study population and tested for IgM antibodies to dengue by IgM capture ELISA. Of 254 dengue probable patients, 99 (39 %) had IgM antibodies and hence dengue infection was confirmed in these patients. Based on the ELISA result, dengue probable patients were further divided into dengue confirmed and laboratory negative dengue patients. The age of dengue confirmed patients by serology ranged from 1.5 months to 56 years. The children constituted 40 % and the adults 60 %. The male and female ratio of dengue confirmed patients was 09:1. The clinical presentation of the study groups clearly indicated that myalgia, arthralgia, rash and retroorbital pain were more specific for dengue infection than OFI and laboratory negative dengue patients.
The results of haematological investigation carried in the study population showed that thrombocytopenia (39 %) was more common in dengue confirmed patients than laboratory negative dengue (19.4 %) and OFI patients (18.7 %). There was no significant difference in the level of platelets between children and adults. Leucopenia was found in 16.2 % of dengue confirmed patients, 25.2 % of laboratory negative dengue patients and 14.2 % of OFI patients. The mean count of WBC less than 1000/µl in dengue confirmed patients was 5.9 ± 1.1 which was significantly lower than OFI and the control group. ESR was altered in 11.1 % of dengue confirmed patients and there was no significant difference between males and females or children and adults in the alteration of ESR. Anaemia (6-9 g/dl) was observed in 25.3 % of the dengue confirmed patients. But, there was no significant difference in the percentage of occurrence of anaemia between dengue confirmed and OFI patients.

Biochemical analysis showed that there was an increase in the level of AST (68.68 %) and ALT (49.49 %) in dengue confirmed patients. The mean AST and ALT levels in dengue confirmed patients were 109.94 U/L and 71.48 U/L respectively. Comparison of aminotransferase levels among study groups indicated that there was a significant difference in both AST and ALT levels between dengue confirmed patients and laboratory negative dengue patients and also between dengue confirmed and patients with OFI. There was no significant difference in the mean aminotransferase levels between males and females. The mean values of ALP, LDH and CPK were 147.6±10, 322.50 U/L and 321 IU/L. The alteration in the level of ALP, LDH and CPK occurred in 56.56 %, 43.43 % and 43.43 % respectively of dengue confirmed patients. The difference in the levels of these three enzymes between dengue confirmed patients and OFI
patients were significantly different. The levels of liver enzymes did not differ significantly between children and adults or males and females.

The mean values of TG, HDL, LDL, VLDL and cholesterol in dengue patients were found to be 215.1, 25.06, 61.32, 29.34 and 150.3 mg/dl respectively. There was a significant decrease of cholesterol, HDL and LDL and a significant increase in triglycerides and VLDL patients in dengue confirmed patients as compared to control group or patients with OFI.

Alteration of cholesterol level was observed in 51.51 % of dengue confirmed patients, altered triglyceride was observed in 63.63 %, HDL, LDL and VLDL concentration was found to be altered in 49.49, 25.25 and 3.03 % of the patients.

The mean values of sodium, potassium, chloride and calcium in dengue patients were found to be 129.38, 5.4636, 115 and 7.908 meq/l respectively. There was a significant decrease in the mean value of sodium in dengue confirmed patients when compared to control group or patients with OFI. The prevalence of dengue patients with hyponatremia was 58 %.

The mean level of albumin found in the dengue confirmed patients was 3.49 mg/dl. 22 % of the patients with confirmed dengue had hypoalbuminemia. There was a significant decrease in mean level of total protein in DF patients as compared to either OFI or control group. In the present study, there was no significant difference in the level of globulin between dengue confirmed patients and control group.

A significant increase in the mean level of serum creatinine, urea and uric acid was seen in dengue confirmed patients. However, only very low percentage DF patients showed increase in creatinine (35.35 %), urea (16.16 %)
and uric acid (10.1 %) levels. Hyperbilirubinemia was observed in 22 % of the dengue confirmed patients

There was an alteration in antioxidants SOD, GPX, TAS, MDA in the dengue patients than the other study groups but the difference was not much when compared to laboratory negative dengue patients. There was a significant difference in these levels dengue between confirmed and OFI patients.