RESEARCH NOTE

PLASMA D-DIMER LEVELS IN PATIENTS WITH TYPHOID FEVER

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Abstract. The plasma levels of D-dimer can be used as a marker of fibrin formation and degradation. Plasma D-dimer levels in the febrile phase of 6 patients with typhoid fever and in the afebrile convalescent phase of 4 of them were measured. D-dimer levels were high in the febrile phase of all 6 patients and within normal range in the afebrile convalescent phase of all 4 patients. Our results indicate that thrombus formation and fibrinolysis may occur in the febrile phase of patients with typhoid fever.

INTRODUCTION

Thrombus formation is followed by activation of the fibrinolytic system and D-dimer is formed by plasmin-mediated proteolysis of cross-linked fibrin. It is well known that the plasma D-dimer level is frequently elevated in patients with thrombus formation. Typhoid fever is an acute febrile infectious disease, and a very common bacterial disease in tropical and subtropical areas, however, the pathophysiological findings in patients with typhoid fever are limited. We measured plasma D-dimer levels during the febrile and afebrile convalescent phases of patients with typhoid fever in order to determine the frequency of thrombosis formation.

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PATIENTS AND METHODS

Patients

The profiles of the patients are shown in Table 1; all the patients contracted their disease outside Japan. The diagnosis of typhoid fever was confirmed through finding *Salmonella* serovar Typhi found in the blood or stool of the patients.

Methods

Plasma D-dimer levels were investigated during the acute febrile phase of 6 patients with typhoid fever, as well as in the convalescent afebrile phase of 4 of these 6 patients. D-dimer levels were assayed by a commercially available kit using a latex turbidimetric immunoassay (Daiichi Pure Chemicals, Tokyo, Japan). The normal range of the plasma D-dimer level is <1.0 μg/ml.

RESULTS

Table 2 shows the plasma D-dimer levels of patients with typhoid fever. Plasma levels of D-dimer were elevated in all patients

Table 1
Patient profiles.

Total number	6
Men/women	4/2
Age	16-30 years (mean 23.0)
Sampling	
Acute febrile phase	2-22 days of illness
Convalescent afebrile phase	15-51 days of illness

Table 2
Plasma D-dimer levels (μg/ml) in patients with typhoid fever.

Patient No.	Febrile phase (days of illness)	Afebrile phase (days of illness)
1	10.9 (4)	0.8 (34)
2	3.7 (7)	0.2 (41)
3	34.3 (2)	0.4 (15)
4	8.9 (22)	ND
5	4.2 (5)	ND
6	4.1 (7)	0.8 (51)

ND = not done

during the febrile phase, and were decreased in all investigated patients in the afebrile convalescent phase.

DISCUSSION

The plasma levels of D-dimer can be used as a marker of fibrin formation and degradation (Bick and Baker, 1992), and assays of D-dimer are thought to be helpful in the diagnosis and management of patients with diseases associated with fibrinolysis (Wilde *et al*, 1999). It has been reported that 40% of patients with typhoid fever had evidence of associated fibrinolysis (Koul *et al*, 1995). Our findings suggest that thrombus formation and degradation may occur during the febrile phase of most patients with typhoid fever. Moreover, the plasma D-dimer levels then decreased during the afebrile convalescent phase in all investigated patients. This reveals that thrombus formation and degradation do not occur during the afebrile convalescent phase of typhoid fever.

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