

## TRAUMATOLOGY

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### Consecutive Measurement of New Coagulation and Fibrinolytic Markers in Acute Ischemic Stroke Patients

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**Objective:** In order to elucidate the consecutive focal coagulo-fibrinolytic changes in acute ischemic stroke patients, the changes in new coagulation and fibrinolytic markers were investigated: thrombin-antithrombin III complex (TAT), plasmin  $\alpha_2$ -antiplasmin complex (PAP), and fibrin-degradation-product D-dimer (FDP-D-dimer).

**Methods:** Thirty-five patients with acute cerebral infarction (<72 hours after onset, mean age = 70 years) were categorized into three groups: Group P, infarction in perforating arteries (n = 15); Group C-R(+), infarction in cortical arteries with recanalization (n = 8); and Group C-R(-), infarction in cortical arteries without recanalization (n = 12). The markers were measured on the day of admission, and one, two, three, four and eight weeks after onset.

**Results:** As shown below, the level of markers are high in weeks one through four. The changes in Group C, especially Group C-R(+), were greater than in Group P. The markers might reflect the etiology of infarction, the volume of damaged brain, and the presence of hemorrhagic infarction.

	Adm	1wk	2wk	3wk	4wk	8wk
TAT (ng/ml)	4.5	6.0	10.0	13.0	8.2	6.1
PAP (ug/ml)	1.2	1.5	1.9	1.7	1.8	1.1
D-dimer (ng/ml)	154	352	373	355	450	400

**Conclusion:** Consecutive measurements of these markers are useful clinically to follow the coagulo-fibrinolytic changes during the acute stage of cerebral infarction.

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### Plasmapheresis in the Emergency Department

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Plasmapheresis has many applications, ranging from the treatment of chronic diseases to various kinds of organ failures. Its utility is widely recognized. In the field of Emergency Medicine, plasmapheresis also is a useful treatment. Various kinds of plasmapheresis have been used to treat many cases with drug toxicity, fulminant hepatitis, renal failure, Guillain-Barre syndrome, and multiple-organ failure caused by shock.

With the exception of fulminant hepatitis and Guillain-Barre syndrome, plasma exchange has produced poor results for most of these diseases. Hemofiltration has been the first choice of treatment even for multiple-organ failure. Thus, it is possible that hepatic insufficiency in multiple-organ failure caused by various kinds of shock can be treated only through continuous hemofiltration without the use of plasma exchange. This is because there is a difference in etiology between postoperative hepatic insufficiency treated in the general intensive care unit (ICU) and hepatic insufficiency treated in the emergency department. Therefore, criteria for use of plasmapheresis in Emergency Medicine must be different from those used for general digestive surgery and internal medicine. In this report, several cases are presented and discuss our findings on the indication and utility of plasmapheresis in Emergency Medicine are discussed.

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### Early Physical Therapy in the Acute Phase of Ischemic Stroke Patients

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**Objective:** Clinical safety and significance of early physical therapy (PT) was investigated in angiographically proven ischemic stroke patients (n = 316).

**Methods:** Patients who received early physical therapy (started within seven days after onset) were classified into two groups by type of infarction: 1) Group P (n = 204), infarction of perforating arteries; and 2) Group C (n = 157), infarction of cortical arteries. The groups were analyzed by level of consciousness using the Japan Coma Scale (JCS); progression in physical therapy program (Stage I, ROM exercises; Stage II, training to sit on bed; Stage III, standing and walking training); and by complications.

**Results:** 74.5% of the patients (80.4% in Group P, 66.9% in Group C) received early physical therapy. Most of the patients in JCS I achieved physical therapy programs and progressed to Stage III (92.4%), but those in JCS II and III did not progress to Stage III (30.8% and 18.2%, respectively). Common subjective complications were neurological symptoms (nausea, vertigo, etc.) and cardiac symptoms (palpitation, dyspnea, etc.), which were observed in 20–30% in both groups. Objective complications, such as abnormal blood pressure and heart rate, were observed in 32.4% of Group C and 4.3% of Group P. Deterioration of consciousness or hemiparesis was not found in any case.

**Conclusion:** Early physical therapy in acute phase of ischemic stroke is safe under close observation of vital signs (especially for patients in Group C) and is significantly promising in patients with a good level of consciousness.