VALUE OF STREPTOKINASE AND HEPARIN IN TREATMENT OF ACUTE DEEP VEIN THROMBOSIS

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regression was not always accompanied by improvement of the phlebograms. Administration of streptokinase was regularly followed by a high blood fibrinolytic activity. The plasminogen fell to 1 to 4% and the fibrinogen to 64% of the initial value. No split products could be demonstrated 24 hours after the infusion. In several of the streptokinase-treated patients bleeding complications occurred after the infusion during the treatment with subcutaneous heparin.

Our findings show that streptokinase is superior to heparin in the treatment of acute venous thrombosis.

TABLE I

DOSES OF STREPTOKINASE AND HEPARIN GIVEN INTRAVENOUSLY IN THE THREE SERIES

Streptokinase-treated Patients				Heparin-treated Patients		
Series	Initial Dose	Maintenance Dose (units streptokinase/hr)	Infusion Time (hr)	Initial Dose (mg)	Maintenance Dose (mg heparin/hr)	Infusion Time (hr)
I	2 × TID (90 min)	50,000	12	75 (90 min)	20	12
II	2 × TID (90 min)	100,000	24	75 (90 min)	20	24
III	2 × TID (90 min)	100,000	72	75 (90 min)	20	72

mg/24 hr) for a period of six to seven days. In all three series the trial was carried out by the double-blind method. The diagnosis was made by phlebography in the acute stage with the exception of the first nine patients in series I. The results of treatment were followed by phlebography on the first and fifth days after the infusion. The effect of treatment was judged by a panel of five to eight doctors before the code was broken and classified as good (++), fair (+), or poor (–) (Table II).

TABLE II

EFFECT OF TREATMENT OF VENOUS THROMBOSIS

	Good	Fair	Poor
<i>Series I</i> (50,000 units/hr—12 hr)			
Streptokinase (12 cases)	4	7	1
Heparin (8 cases)	4	2	2
<i>Series II</i> (100,000 units/hr—24 hr)			
Streptokinase (8 cases)	5	2	1
Heparin (8 cases)	1	2	5
<i>Series III</i> (100,000 units/hr—72 hr)			
Streptokinase (7 cases)	3	1	3
Heparin (7 cases)	1	1	5

In series I no difference was found between the effect of streptokinase and heparin; in series II streptokinase was three times, and in series III, twice as good as heparin. Even those cases that responded well to treatment with streptokinase still showed small residual thrombi. In a few of the streptokinase-treated patients in series II and III phlebography showed that the previously involved valves were intact after treatment. The results of treatment with heparin appear much poorer in series II and III than in series I. This is probably because several of the patients in the heparin group in series I were not examined phlebographically and because good clinical

provided a sufficiently large maintenance dose (100,000 units/hour) is given and that treatment is continued for at least 24 hours. The fact that it proved possible to save venous valves in veins containing thrombus, something we have never observed after treatment with heparin alone, is a further strong indication for streptokinase therapy.

THE TREATMENT OF DEEP VEIN THROMBOSIS

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Twenty-six patients with extensive thrombosis but whose symptoms were of less than three days' duration were allocated, by a random method, to one of three treatment groups. All received a continuous intravenous infusion of physiological saline containing either streptokinase (Kabikinase, Kabi Pharmaceuticals Ltd, a plasminogen activator, 150,000 units hourly; Arvin (Twyford Laboratories Ltd), an enzyme which specifically destroys fibrinogen (Reid and Chan, 1968), 1 unit/kg body weight every 12 hours; or the anticoagulant heparin, 20,000 units every 12 hours. The loading doses given at the start of the treatment were 500,000 units of streptokinase in 30 minutes, 160 units of Arvin in six hours, or 10,000 units of heparin in five minutes.

The infusion was stopped after seven days or earlier if the disappearance of radioactivity suggested, and phlebography confirmed, the complete dissolution of all thrombi from the limb. This occurred in six of 15