Summary

As introduction reference is made to the importance of the training of the doctor in the management of anticoagulant therapy: the pharmacology of these substances as well as their exact clinical use must be learned. Anticoagulant therapy takes much of the doctor’s time because the danger of bleeding requires constant supervision of the patient. For comparative purposes the incidence of thrombosis and its mortality rate in obstetrics and gynecology are given for Scandinavia, Switzerland and the Frauenspital Basle. The percentage of fatal lung embolism in the total mortality is considered. The part played by constitution is also mentioned.

In obstetrics the percentage of fatal lung embolism in the total mortality in recent years (1943 to 1946/49) varies from 3 % (Scandinavia) to 10 % (Switzerland) and 20 % (Basle). The absolute mortality from lung embolism varies from 0.03 ‰ (Sweden) to 0.2 ‰0 (Switzerland) and 0.21 ‰ (Basle).

In postoperative gynecology the percentage averages 12 % (Sweden), 30 % (Switzerland) and 24 % (Basle). The absolute mortality from lung embolism varies from 1.3 ‰0 (Sweden) to 3.9 ‰ (Switzerland) and 1.8 ‰ (Basle).

The clinical symptoms by which the course of thrombosis is assessed are then cited, whereby the subjective disturbances and the fluid balance are given a particular significance.

In addition, the methods for the various laboratory investigations used in practice are described. These include inter alia: test for the heparin excreted in the urine, the fibrinolytic action of the urine; various methods for estimating coagulation time (beginning and end), retraction, antithrombin; prothrombin, factor V, consumption test, hematocrit readings.

As a result of numerous tests in human subjects the pharmacology of heparin and dicumarin is described in detail with consequent emphasis on the marked superiority of heparin. Depot-heparin and the neutralization of its action by protamine sulphate receive much attention: protamine sulphate is effective not only intravenously but also intramuscularly. The cause and significance of hematoma formation in depot-heparin treatment are also mentioned. Every case of thrombosis should receive heparin treatment initially. Dicumarin or depot-heparin should be given only after the end of the acute stage.

The dosage of the various anticoagulants is decided at the patient’s bedside by careful observation of the course of the thrombosis. That progressively smaller doses of heparin are necessary as recovery proceeds is shown by the excretion test results.

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The i. v. heparin dosage must be adapted daily to the clinical picture; we differentiate as follows:

A minimal initial heparin dose which immediately arrests the thrombotic process, according to the case in question: 50,000-120,000 I.U./24 hours.

An intermediate dose which is given as soon as the progress of the thrombotic process is arrested: 50,000-80,000 I.U./24 hours.

A terminal dose: 40,000-60,000 I.U./24 hours.

A minimal dose for the prophylaxis of fatal pulmonary embolism: 40,000 I.U./24 hours.
A warning is given against the danger of underdosage which favours the occurrence of fatal prodromeless pulmonary embolism or delays clinical progress. A dosis maxima simplex of 25,000 I.U. is proposed in order to avoid hemorrhage and hematuria. When the daily dosage exceeds 80,000 I.U. it should be spread over 6, instead of 4, injections at 4-hourly intervals.

A special section deals with the changes in the coagulation mechanism occurring during i. v. heparin therapy. Thrombosis can only be treated successfully if there is a distinct cumulative heparin effect built up by successive injections spread over the day; e.g., the coagulation time by Fonio’s method which is normally 30 minutes increases in the evening before the 4th and last injection to 2-3 hours. The percentage of the injected heparin excreted in the urine over 24 hours varies from 15-20 %.

The effect of dicumarin is often unsatisfactory and the therapeutic margin very narrow; the prothrombin level must lie between 10 % and 20 % of normal, with consequent increased danger of hemorrhage.

The indications for anticoagulant therapy in the various types of thrombosis are described and attention drawn to the necessity for early treatment and to the danger of hemorrhage. Sections on practical therapeutic procedure with heparin and on the incidents are also given.

Two clinical concepts, the crisis and lysis of thrombosis are introduced in order to facilitate judgment of the clinical course of thrombosis, especially during administration of anticoagulants. An acute beginning of the recovery phase is described as the crisis: the negative fluid balance suddenly becomes positive and there is a distinct cumulation of the heparin effect in the blood in cases without thrombolic swelling. Lysis consists of a shortened recovery phase with massive elimination of edema and frequently increased fibrinolytic substances in the urine. Crises and lysis are of every rare incidence in conservatively treated cases of thrombosis and it is the aim of anticoagulant therapy to obtain them. Methods of treatment and dosage are inadequate if they do not induce crisis and lysis.

In conclusion the following are discussed: the advantages of specific over conservative treatment, the physical after-treatment of thrombosis in the early post-thrombotic stage, the after-effects, the question of capacity for work and the cost of the specific treatment. The single after-effect of heparin therapy which must be mentioned is a marked but benign falling out of hair occurring from one to four months after the end of the treatment. The problem of the prophylaxis of thrombosis is also discussed and emphasis is laid upon adherence to the conservative prophylactic measures.

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