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0724 HEPARIN ANTICOAGULATION: A SYSTEMS APPROACH.

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Failure to give heparin in a repeatable manner has prevented definition of conditions which optimize heparin's use. We have set up an algorithm (AL) for continuous IV heparin to be given in a standard manner to pts. with suspected venous thrombolic disease(TED). AL's intent was to allow intermittent adjustment of heparin to keep the activated clotting time(ACT) between 170-200 secs.(1½-2 x normal). Other pts. not on AL who received continuous IV heparin and were monitored by the ACT served as a non-random concomitant control population. Five community hospitals provided 120 pts managed by nurses using AL. AL kept the ACT in the goal range (76% vs 54%) and bleeding was diminished but not eliminated (<2% per day exposure). Bleeding, in spite of good control of the ACT, occurred only between days 2 and 9. This decrease in bleeding occurred despite increased amounts of heparin (1767 u/hr. mean vs 1200 u/hr., literature's mean). No clinical recurrences were recognized but efficacy could not be tested because TED was not always documented by phlebography. Physicians' acceptance of the nurses role has been excellent. With AL, hypotheses concerning infusion conditions to optimize heparin's safe and efficacious use can now be tested.

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0725 HEPARIN TREATMENT OF DEEP VENOUS THROMBOSIS: CLINICAL USEFULNESS OF BLOOD TESTS

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280 patients with phlebographically proven DVT have been treated with heparin infusion for 5 days followed by control phlebography. Daily blood samples were analyzed for heparin activity by 3 different assays (amidolytic assay, APTT, thrombin cl. time) to see if there exists a correlation between the clinical effects (on the local thrombotic process, on embolization, and on bleeding complications) and the results of laboratory tests.

Four patients suffered from major bleedings, and one was fatal. Compared to mean results, heparin activity was clearly exessive in three of these patients, particularly with the amidolytic assay. About ten per cent of the patients had minor bleedings.

A transient drop in the antithrombin concentration was observed in most patients, but sustained subnormal concentration (< 70 %) was seen in ten patients. One patient developed thrombocytopenia and DIC. The influence of heparin dosage on heparin activity/concentration and on the thrombotic process will be evaluated.

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0726 HEMATOLOGIC ANALYSIS FOLLOWING INTRAVENOUS CALCIUM AND SODIUM HEPARIN ADMINISTRATION.

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Twenty normals received in randomized order a dose of 1000 units each of calcium and sodium heparin intravenously seven days apart. The heparin used for preparation of the calcium salt was from the same batch as the sodium salt. Blood tests were obtained pre, 15 and 60 minutes after injection. Values of hematocrit, hemoglobin, RBC, WBC, prothrombin time and platelet adhesive index showed no significant response to the quantity of heparin. Lee White, activated partial thromboplastin time, activated clot time, thrombelastograph and thrombin calcium clot time doubled at 15 minutes. Heparin levels reached 0.4 U/ml (Anti X assay) at 15 minutes while factor X was decreased by 15% for both heparin salts. A differential response to the heparin salts was seen at 15 minutes where the FSP was increased (average difference $\pm$ standard error of the difference) by $1.6 \pm .6$ ug/ml, fibrinogen decreased 49 ± 20 mg/ml and plasminogen dropped $2.3 \pm .6$ mg/ml for the sodium salt compared to the calcium preparation. With the exception of fibrinogen, these statistically significant differences between the salts disappeared by 60 min. ATIII levels were slightly lower for the sodium heparin. Significant changes in C'3, C'4 and serum calcium were noted with both heparins. These results suggest similar hematologic effects following intravenous sodium or calcium heparin except for an apparent increased fibrinolytic response at 15 minutes when the sodium salt was administered. Due to the small magnitudes of these fibrinolytic changes, these findings may be of questionable clinical significance, but merit further investigation at higher dose levels.