Maycock, British Experience with Dextran 275

Fletcher F. (1953) : Personal communication.

Bleeding Time Prolongation after Dextran Infusion

Edward Adelson
Washington, District of Columbia, USA

Of 165 normal humans, 77 or 45.7% developed a prolonged bleeding time after infusion of 1000 ml of commercial dextran. This prolongation was demonstrable by the Duke and Ivy methods of measuring bleeding time, as well as by a modification of the Ivy method whereby skin temperature is controlled, and bleeding is measured by volume of blood loss as well as by duration. The interaction of dextran and the hemostatic system was not immediate, since the bleeding time prolongation reached maximum in 3 to 9 hours. A similar hemostatic defect was found in dogs that received intravenous dextran.
Several minor deficiencies of plasma coagulation components were demonstrated by standard methods of measurement, but these were probably on the basis of dilution. Fibrinogen alterations, fibrinolytic activity and hypervolemia were all ruled out as etiologic agents. A decrease in tensile strength of the clot was demonstrated. The higher the molecular weight of dextran, the more marked its effect, but even material with a weight as low as 20,000 produced the hemostatic defect. The following evidence points to the platelet as the site of this action of dextran:
1. A positive tourniquet test develops in those patients with prolonged bleeding times. 2. Dextran in vivo and in vitro produces interference with prothrombin consumption. 3. In dogs dextran causes a transient thrombocytopenia and platelet
clumping. In humans, platelet clumping does not occur and the slight thrombocytopenia
is probably due to hemodilution. 4. The most sensitive human was a
patient with moderate thrombocytopenia. 5. In dogs made moderately thrombocytopenic
by irradiation, the hemostatic defect was markedly exaggerated.
C14-labelled dextran was mixed with whole blood in siliconized glassware with
sequestrene anticoagulant. After an appropriate period of incubation, the platelets
were separated and repeatedly washed. It was impossible to free the platelets of the
radioactivity. This points to a tendency for dextran to coat the platelet and may
explain the hemostatic defect after dextran infusion.

Blood Volume Changes after Infusion of 6\%/o and 10\%/o
Dextran Solutions*

K. H. Koster, V. Sele, E. Sindrup and M. Schwartz
Copenhagen, Denmark

Abstract

Previous investigations of blood volume after infusion have shown conflicting
results.
In 40 healthy persons the blood volume was measured (I131 tagged human
albumin) before, 1 hour and 4 hours after infusion of 500 ml dextran - 6 % and 10 %
solution.
The increase in blood volume corresponds to about 18 ml per gram dextran
(substance).
The effect of anaphylactic reactions in lowering the blood volume is shown, and
the relation between blood-dextran concentration and plasma proteins is investigated.

* Published in extenso in the Lancet, 1957/II.