Scottish National Blood Transfusion Association.

ANTIHAEMOPHILIC FRACTION.

There are a number of conditions other than haemophilia which give rise to a family history of bleeding with or without a prolonged clotting time. The factors which are deficient in certain of these conditions are not present in the Antihaemophilic Fraction. Consequently, unless there is a definite diagnosis of haemophilia, the Fraction should not be relied on, and fresh blood, or fresh plasma should be used in preference.

Description.

The preparation is a protein fraction obtained from fresh human plasma by the ethanol fractionation method of E.J. Cohn. It consists mainly of fibrinogen, containing in addition the antihaemophilic factor. Each ampoule contains 200 mg. dried protein, with less than 0.5% moisture. Reconstitution with 10 ml. of sterile distilled water gives an isotonic 2% protein solution at approximately neutral pH.

The Fraction is prepared from 15 donor pools of fresh plasma from selected donors who have no history of clinical jaundice, and no recent contact with a case of jaundice. The risk of serum hepatitis from this material is considered to be no greater than from the small-pool plasma in general use.

Synonyms: "Fraction I" (Cohn), "Antihaemophilic Globulin", "Fibrinogen Fraction". A similar fraction is prepared by ether fractionation (Kekwick).

Use.

In general Antihaemophilic Fraction may be regarded as a substitute for fresh (or specially prepared and stored) plasma in the control of bleeding in haemophilic subjects, the effect of 10 ml. o. the reconstituted material being roughly equivalent to 100 ml. of fresh plasma, or 200 ml. of fresh blood.

It has the advantage of easy storage and administration, and the small volumes reduce the danger from the transfusion of large quantities of fluid in situations where this is contra-indicated. (For example, owing to the short duration of the response, it is necessary to continue daily transfusions or injections for 2 to 4 days after bleeding has ceased, so that any improvement in the clotting properties may be maintained until the lesion has time to heal).

In an emergency when fresh blood or plasma is not immediately available, the Fraction can be used to supplement stored blood, stored plasma or plasma substitutes.

Choice of Treatment.

In deciding whether fresh blood*, fresh plasma*, or Antihaemophilic Fraction should be given to a patient, the following should be taken into account:-

(1) Risk of development of anticoagulants.

Patients receiving repeated transfusions or injections may develop a refractory state, and cease to show a response (as indicated by clotting time determinations). In some of these cases investigation has shown the presence of antibodies, which are presumed to inactivate necessary clotting factors. There is some evidence to suggest that such anticoagulants develop more frequently when the Antihaemophilic Fraction is used, but the number of cases investigated has been limited.

In cases in which anticoagulants have developed, the transfusion of large quantities of fresh blood appears to give the best results.

(2) Risk of blood group sensitisation.

The repeated transfusions required by haemophilic patients greatly increase the chances of developing immune blood group antibodies. Whole blood should therefore be used as little as possible and special care should be taken with grouping and compatibility tests. Unless the condition of the patient indicates a necessity for red blood cells, either fresh plasma or Antihaemophilic Fraction should be given.

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Footnote.

The term "fresh blood" is used throughout to indicate continuous storage at 4°C. to 10°C. for less than 48 hours after withdrawal from the donor.

The term "fresh plasma" refers to plasma stored at 4°C to 10°C and used within 48 hours of the withdrawal of the blood from the donor.

The following preparations may be regarded as equivalent to fresh plasma:-

(a) fresh plasma frozen to below -20°C. and stored continuously at this temperature for up to one year.

(b) fresh plasma frozen and dried to less than 0.5% moisture, and stored at below +10°C. for up to one year.

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DOSAGE.

The doses stated in the table below may be taken as minimal both for initial treatment and for subsequent daily administration until the risk from haemorrhage is past. Alternative quantities of fresh blood, fresh plasma, and Antihaemophilic Fraction are shown.

Larger doses may be considered advisable, but care must be taken when whole blood or plasma is used as there may be a danger of overloading the circulation, particularly if there is uncertainty regarding the amount of blood which has been lost.

Age	Fresh citrated blood	Fresh or specially preserved plasma	Antihaemophilic Fraction
Under 6 months	125 ml.	50 ml.	100 mg.
6 months - 4 years	250 ml.	100 ml.	200 mg.
5 to 10 years	500 ml.	200 ml.	400 mg.
11 to 14 years	750 ml.	300 ml.	600 mg.
Adult	1,000 ml. (2 bottles)	400 ml. (1 bottle.)	800 mg. (4 ampoules)

Pre-operative Use.

The injection of blood products does not completely restore the clotting properties of a haemophiliac to normal, and there is still a serious risk of operative haemorrhage. If operation is unavoidable it is suggested that a pre-operative transfusion or injection should be given, at the above dosage rates, approximately 1 hour before the operation. The treatment should be controlled by appropriate laboratory tests, and fresh blood, tested in advance for compatibility should be available for use during and after the operation. Daily transfusions or injections of active antihaemophilic preparations should be continued for 2 to 4 days after the operation.

Reference Book: "Human Blood Coagulation and its Disorders" by Biggs and Macfarlane, (Blackwell, 1953).

Regional Blood Transfusion Centre, Royal Infirmary, Edinburgh, 3. 27.4.54.