Technical methods

A simple method for plasma exchange

R. SLADE, J. REVILL, R. M. HUTCHINSON, AND J. K. WOOD *Department of Haematology, The Leicester Royal Infirmary, Leicester LE1 5WW, UK*

We report the adaptation of the Fenwal leucopheresis pump for plasma exchange and exchange transfusion. Plasma exchange can be carried out either manually, using disposable taking sets and a refrigerated centrifuge, or with the aid of expensive equipment for continuous or discontinuous centrifugation. Our simple adaptation makes an efficient exchange of plasma possible with a relatively inexpensive piece of equipment and low running costs.

The Fenwal leucopheresis equipment has a peristaltic pump capable of taking three lines. In the standard white cell collection, two of these carry donated blood and the third heparinised saline. Blood from one donor arm is pumped along line A (Fig. 1) which divides (into two equal lines) immediately before entering the pump. Having

passed through the white cell filters these recombine before return to the donor's other arm.

By using separate lines, one can use the machine to pump blood from the patient's left arm through line Ap (Fig. 2) into a blood donation bag. At the same time and at the same flow rate, blood or plasma protein fraction can be pumped back into the patient's right arm, through line Bp. As each blood donation bag is filled, it is spun, the plasma is discarded, and the red cells are returned along line Bp using a Y type giving set. If the patient is anaemic, compatible blood is used in line Bp initially. If there is no anaemia, the patient is able to tolerate a two-unit deficit of red cells, the blood volume remaining unchanged. The line Ap is heparinised via the side arm, using normal saline containing 20 units/ml heparin and running at 100 ml/h. We found that the patient need not be given heparin.

We have carried out this procedure on 25 occasions, in four patients, without ill effect. Three patients had hyperviscosity syndrome and the other systemic lupus erythematosus. The volumes of plasma exchanged ranged from 2000 ml to 2700 ml in a two-hour procedure. We consider that this machine and adaptation offers an inexpensive, easy, and rapid method of plasma exchange for patients in need.

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Fig. 1 Basic flow diagram for leucopheresis.

Fig. 2 Basic flow diagram for plasmapheresis exchange transfusion.

Requests for reprints to: Dr Robert Slade, Department of Haematology, The Leicester Royal Infirmary, Leicester LE1 5WW

A new approach to the preparation of bicarbonate solution for use in virus isolation media

A. G. HIGGINSON AND R. L. C. PILE *Department of Microbiology, Royal Air Force Institute of Pathology and Tropical Medicine, Halton, Aylesbury, Bucks, UK*

The preparation of bicarbonate solution in small sterile aliquots for addition to culture media as a buffering agent is standard practice in many laboratories. It is necessary to pre-gas this solution with carbon dioxide in order to ensure a final pH of 7.4 and adequate buffering in the final medium. It is difficult and time-consuming to obtain a sufficient concentration of carbon dioxide in the solution, particularly as autoclaving the aliquots even with tight stoppering causes some loss of carbon dioxide. The need for a new and expensive regulator for the

carbon dioxide cylinder caused us to look for a more efficient method of gassing. An ordinary 1.8 litre Sparklets soda syphon was found to be a cheaper alternative, to save a considerable amount of technician time, and to be more effective, giving an increased shelf-life to the aliquots.

Material and methods

BICARBONATE SOLUTION	
Sodium hydrogen carbonate	88 g
0.2% Phenol red ¹	100 ml
Deionised water	1900 ml

The sodium hydrogen carbonate and 0.2% phenol red are placed in a flask and made up to 2 litres with deionised water. This is used to fill the 1.8 litre Sparklets soda syphon, which is then gassed using two Sparklets carbon dioxide bulbs, and the contents are shaken vigorously for two

¹0.2% phenol red solution is made by dissolving 100 mg of phenol red in 5 ml 0.05 molar sodium hydroxide and diluting to 50 ml with deionised water.

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