EXPERIENCE OF HOME DIALYSIS USING DISPOSABLE DIALYSERS


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The home dialysis programme in Birmingham has been started as one solution to increasing demands for treatment in the face of shortage of hospital space and nursing staff (Eschbach et al., 1966 and Baillod et al., 1966). It has been coupled with the development of proportionating and monitoring machinery and continued research into disposable dialysers.

A fixed ratio proportionating and monitoring unit (Simpson et al., 1967a) has been used. An arterial line pressure monitor has been added to give immediate warning of a rupture of the arterial line as blood pumps are used during sleep.

Birmingham tap water is virtually free from calcium, but two of our patients are in outlying areas with hard water. In their homes resin column sodium ion exchangers have been used. A manually recharging model of capacity to give 4 dialyses without attention was chosen. The sodium content of the softened water was measured and the concentrate diluted appropriately. The sodium content in both areas was between 6 and 8 mEq/litre. This has to date remained constant and the conductivity reading has remained within the acceptable limits of plus or minus 2.5%.

Patients are dialysed twice a week overnight for 12-15 hours using twin minicoils (Simpson et al., 1965, 1967b). The dialysers are disposable and include arterial and venous lines. They
are gamma ray sterilised as one unit and therefore setting up and priming takes only 5-10 minutes. We recommend a separate room for dialysis (Baillod et al., 1966) with a cold water supply and floor level drain.

Supplies are delivered from the hospital monthly. Each batch of concentrate and each standard for conductivity monitoring is analysed before despatch.

There are three patients now on home dialysis giving a total experience of 22 patient months. There are two more patients under training. The first two patients are both housewives and have been able to return to full activities: they have been on home dialysis for 13 and 6 months respectively. The third patient has been on home dialysis for 3 months. He has returned to full-time work as a service engineer.

Six to eight weeks has been found to be a reasonable time for training in hospital. The family are then responsible for the routine management of dialysis including keeping charts of weight and blood pressure. They take the pre- and post-dialysis blood samples fortnightly and collect blood for transfusion when necessary. Blood has been given at regular intervals rather than allowing the patients to judge from the packed cell volume. The requirements are 3 units per month, 2 units per month and 0 respectively.

All patients have Quinton-Scribner shunt in the arm and the spouse has been taught to declot a shunt. Three recannulations have so far been necessary, 2 involving artery and vein and one artery alone. It should, however, be noted that 2 shunts were in situ for almost a year before home dialysis.

The patients are medically reviewed once a month in hospital, and the hospital dialysis technician visits each home once a month to check the machinery. The technician has had eight extra calls for technical repairs. There have been seven urgent calls for assistance during dialysis at which time a member of the medical staff is on call. Three were for technical faults (a leaking non-return valve, a cracked conductivity electrode, and a suspected failure of the alarm system). Only one out of 200 dialyses has had to be postponed because of technical trouble. Four calls were for medical attention and one dialysis had to be discontinued because of persistent vomiting. The other medical calls were for an attack of pulmonary oedema, an episode of hypotension, and an epileptic fit in a mild epileptic.

Apart from the saving in money and space we have found that all three patients prefer to be dialysed at home. They soon become proficient at handling the equipment. The use of arm shunts has necessitated reliance on the spouse for connecting up and declotting procedures. In one family undue reliance on the spouse has been a disadvantage in rehabilitation. The proportionating and monitoring unit has proved reliable and hard water problems to date have been solved. Capital costs are £1,100. We feel that persistence with disposable dialysers is justifiable on account of the ease and convenience. However, the annual cost per patient is £700 out of a total cost of materials of £1,200. We are confident this will be reduced in the near future.

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The twin minicoil is obtainable from Capon Heaton & Co. Ltd., Hazelwell Mills, Kings Norton, Birmingham, 3M.

The sodium exchanger used is the model DR2 Permutit Water Softener obtainable from the Permutit Company Ltd., 151 Regent Street, London, W.I, England.

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REFERENCES


DISCUSSION

Rae (Seattle): None of our patients nor staff have suffered from hepatitis in a home dialysis training unit. I want to emphasise again how important we consider thrice-weekly dialysis in Seattle. None of our patients, unless they are very small people, start off with twice-weekly dialysis. I think it is important, since most of them will eventually require thrice-weekly dialysis, that they start at thrice-weekly dialysis, otherwise there is difficulty in getting them to increase. I suspect that in the last paper they might not have had the problem of pulmonary oedema or the problem of hypotension during dialysis if thrice-weekly dialysis had been instituted. Thank you very much.

Maxwell (Los Angeles): The enthusiasm for home dialysis is overwhelming but I anticipate certain logistical problems if the expansion in the home is as rapid as Dr. Shaldon, for example, would wish. Is there no patient so far who has been started on home dialysis, whose best friend has become his worst enemy, whose wife has divorced him, whose circumstances have changed making it necessary to back this patient up once again in the hospital? The same will be true of course for shunt problems, for hyperparathyroidism and so forth, so that it seems to me that in the expansion of home dialysis it must be an orderly expansion and we must have more experience to allocate a sufficient number of hospital beds for back-up for these problems which must inevitably arise.

Baillod (London): If you introduce self-dialysis, you do relieve yourself of the problem of co-opting the whole family into dialysing and this is the most vitally important thing you should do in order not to alienate the patient from his friends. This can be done if you teach them independently of the family. Since we have done this, we have one group of patients who are dependent on their family and they do give trouble and there is bad feeling within the family, but in those who have gone onto independent dialysis we get no feeling of resentment from anybody.