

Big Kiil plates, external shunts and massive heparin doses in the 1970s.

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Abstract

This paper describes some challenges of haemodialysis nursing in the 1970s. The major issues were the large blood volumes in the extra-corporeal circuit, massive doses of heparin during haemodialysis, maintenance of the external shunt patency, pyrogenic reactions and many blood transfusions.

The dialysis treatment was 14 hours, twice per week, either Monday/Thursday or Tuesday/Friday

I commenced working in renal nursing in 1973, following an interview and a tour through the haemodialysis unit. During the tour of the haemodialysis unit, I was introduced to the renal physician who said to me “you do not have to worry until the blood hits the ceiling”. I must admit this was a little disturbing, as I really had no idea of what dialysis was, only that the job was very close to where I was living at the time. For all of that renal nursing became my passion and it remains so to this day.

In the early 70s, in the unit in which I was working we used Kiil plate dialysers and Drake Willock 480 dialysis machines. A dialysis session consisted of 10 hours, generally through an external arterio-venous shunt. This equipment presented some challenges that are not issues in 2008.

Figure 1 Kiil Plates

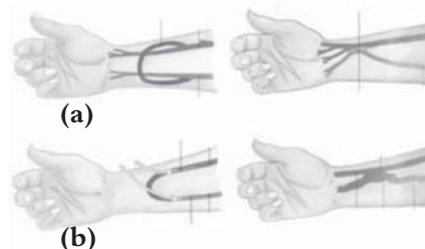


(Source: [http://renux.dmed.ed.ac.uk/EdREN/Unitbits/historyweb/historypics/Kiil\(lots\)bw.jpeg](http://renux.dmed.ed.ac.uk/EdREN/Unitbits/historyweb/historypics/Kiil(lots)bw.jpeg))

Firstly the Kiil plate dialyser (see figure 1) was approximately one (1) meter in length and approximately 60 centimetres

in width and the plates were made of heavy duty plastic and the frames of steel – so they were big and heavy. At the completion of each dialysis these plates were stripped down and the membranes were replaced and the plates rebuilt by the nursing staff. This was an interesting task as if the membranes were damaged at all a blood leak would ensue – and believe me it was an extremely visible blood leak – bright red in the dialysate outflow hose! Where possible the Kiil plates were reused for the same patient and so a reuse procedure was in place – first flush the system with water (which was just carbon filtered), secondly run bleach through, and thirdly fill plate with Formalin, which of course was flushed out with normal saline before reuse. Even the blood lines went through this procedure for reuse on the same patient. The Kiil plates had anything from 200–500 millilitres of blood in the extracorporeal circuit. The blood volume was directly proportional to the negative pressure applied to the dialysate side of the membranes because the cuprophane membranes were extremely compliant.

Figure 2 External Haemodialysis Shunt (a) and (b)



Key Words

history, kidney, renal, peritoneal dialysis

(Source: http://publicsafety.com/article/photos/1129656625280_diagram.jpg)

We generally used external arterio-venous shunts (see Figure 2), although native A-V fistulas were becoming more popular. The external shunts presented challenges in particular maintaining their patency. These shunts consisted of siliconised tubing which had one end sutured in an artery and one end sutured in a vein and the tubing was then connected outside the body, and which was separated for connection to the lines for dialysis. One good thing about these shunts was that they could be used immediately. With the use of these shunts it was not always necessary to use a blood pump, the blood flow was maintained by the patients own heart. One evening I discovered what the renal physician meant by ‘blood on the ceiling’. One patient had become disconnected from the blood lines (they had an external shunt), and the arterial spray did hit the ceiling!

The major issues for me as a dialysis nurse in these times were the blood volume in the extra-corporeal circuit (lots of serious hypotension), massive doses of heparin during haemodialysis (an average of 2,000 units infused per hour), maintenance of the external shunts’ patency (personally did a lot of clot removal from the shunts), lots of pyrogenic reactions, and lots of blood transfusions (before the days of EPO). The pyrogenic reactions of course were due to the bacterial toxins crossing through the dialysing membrane secondary to the relative poor water treatment in those days. However through all these ‘interesting times’ I did learn an enormous amount about dialysis.

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