

Continuing Challenges in Haemodialysis Treatment

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The number of patients on renal replacement therapy (RRT) world-wide was estimated at 2.3 million in the year 2008 and of this 1.58 million was on Haemodialysis (HD) treatment¹. The world-wide RRT population grew by about 7% annually. By the year 2020, the USA expects to see 750,000 patients receiving RRT of which more than 500,000 will be on HD². Malaysia too has seen a remarkable growth in the number of patients on RRT, most of whom are on HD. Data from the National Renal Registry (NRR) showed that in 2010 there were a total of 24,773 patients receiving some form of RRT of which nearly 80% are on HD³. Of interest is the fact that that Diabetes mellitus is the most common cause of ESRD in the country and secondly patients over the age of 65 years form the fastest growing group of HD patients.

Haemodialysis treatment has made tremendous progress since the day Belding Scribner introduced the Scribner shunt almost fifty years ago, which made long-term HD treatment possible. Progress was made on all fronts from vascular access to membrane technology to advances in HD machines⁴. The understanding of the pathophysiology of uremic complications has led to better treatment of bone disease, anaemia, cardiovascular disease and other manifestations of kidney failure⁴. Nonetheless many challenges remain including the high prevalence of coronary artery disease, maintaining patency of the vascular access in the face of changing patient demographics (more elderly and diabetic patients) and in many developing countries reducing risks of infectious complications especially Hepatitis C amongst HD patients.

In this month's issue of the Medical Journal of Malaysia there are three articles relating to HD treatment in the country and they highlight the three challenges mentioned above. The first article "Predictors of failure to mature of Autogenous AV fistula" by Wan Najmi et al. discuss an important aspect of HD treatment i.e. the vascular access for chronic HD treatment⁵. The autogenous Arterio-Venous fistula (AVF) has been described as the "lifeline" of the patients on long-term HD; at the same time it is their Achilles heel. It is the preferred vascular access for HD patients⁶. It is the most common form of vascular access for HD patients in this country³. Its proper creation is vital to maintain long-term patency. In their paper Wan Najmi *et al*⁵. studied a single-centre's experience with factors associated with failure to mature of the AVFs. The study is commendable in that it involve a sizeable number of patients and looked at a range of factors known to impact the success of an AVF. They found the presence of peripheral arterial disease, distally placed fistulae, lower mean arterial pressure and absence of an immediate post-operative thrill as

predictors of failure to mature. These factors except the absence of a thrill have been reported in other studies⁷. Interestingly they did not find Diabetes and older age as playing any role in the failure to mature of the AVF. Many studies have given conflicting reports on the impact of these two factors on the success of the AVF. The authors may want to analyse further the diabetic subgroup in view of high number of diabetics in the incident dialysis patients. Some authorities advocate the creation of proximal AVF in diabetics as they claimed higher rate of success in this approach^{8,9}.

Coronary artery disease (CAD) is the most common cause of mortality and morbidity in ESRD patients. Treatment options for HD patients with CAD, are similar to that of the non-uraemic patients, however outcomes are different with ESRD patients doing far worse¹⁰. A Systematic Review compared coronary artery bypass graft (CABG) and percutaneous intervention (PCI) amongst ESRD patients with CAD and the preliminary findings showed that there was a higher short-term mortality in those who had CABG but deaths over the subsequent 1-5 years were similar between the two groups¹¹. The second paper in this issue "Outcome of Coronary bypass Grafting in End-stage Renal disease patients" by Koh Keng Hee *et al* studied the outcome of CABG in a small group of patients¹². This study suffers from the same constraints seen in other similar studies. It is an observational study with small number of patients. There is difficulty in controlling confounding factors. In their small sample there was no perioperative death but four patients died within between three months and 6 years with only one from a cardiac cause. The relatively good result may reflect selection bias, a confounding factor often seen in this type of observational study.

The third paper in this issue highlights an interesting problem i.e. the presence of mixed genotype Hepatitis C infection amongst HD patients. Testing for anti-HCV antibodies prior to admitting a patient to a HD unit and subsequently at regular intervals is routinely done both as advocated by Clinical Practice Guidelines^{13,14} as well as mandated by law¹⁵. However hardly any HD centre does any genotype testing as such a test is not easily available and is expensive. The paper by Hairul Aini Hamzah et al, showed that in a sample of 40 patients with Hepatitis C, five (12.5%) had mixed genotype infections. Most of the Hepatitis C infection occurred after starting hemodialysis and in eight patients there was co-infection with Hepatitis B¹⁶. Although the authors attributed the Hepatitis C infection to multiple blood transfusions, a major concern is whether there is a breakdown in universal precautions and cross-infection

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control procedures. The finding from this paper also raises a question for policy makers and regulators from the Ministry of Health. The current practice in Malaysia is to enforce a separate treatment area and dedicated machines for Hepatitis C patients undergoing HD in addition to practising universal precautions. The Centre for Disease Control and Prevention USA (CDC), does not recommend isolation of patients with Hepatitis C nor the use of dedicated machines¹⁷. They do not ban reuse of dialysers in such patients. The Kidney Disease: Improving Global Outcomes (KDIGO) Clinical practice Guidelines made similar recommendations¹⁴. They stress the need for a strict adoption of universal precaution measures. One of the major arguments for such an approach is that isolating Hepatitis C hemodialysis patients may lead to superinfection with another genotype virus. Could this be what had happened with the five cases reported by Hairul Aini *et al*? The fact that these patients were isolated may have led to the staff to lower their guard with universal precautions measures.

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Editor's Note:

We have a fourth paper concerning management of end-stage renal disease patients in this issue. The study relates not to problems on haemodialysis but before patients get there. E K Ng, MRCP, B L Goh, FRCP, P Hamdiah, have studied "In-Centre Intermittent Peritoneal Dialysis: A Viable Interim Option To An Eventual Definitive Renal Replacement Therapy?" These four papers bear witness to how large a burden of disease renal failure has become for Malaysia.