

Access Recirculation in Hemodialysis

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Received: January 31, 2015; Accepted: February 18, 2015

Keywords: Arteriovenous Fistula; Recirculation; Hemodialysis

Dear Editor

Recently, with great interest we read the published article by Beladi Mousavi et al. entitled "Arteriovenous Fistula Recirculation in Hemodialysis: Causes and Prevalence" in your most respected journal (1).

The authors evaluated 100 hemodialysis (HD) patients with arteriovenous (A-V) fistula who were on HD for more than 3 months. They determined the prevalence and cause of access recirculation (AR) among these patients. According to the results of the study, AR is a common cause of inadequate HD, which was occurred in 17% of patients. In addition, the most common cause of recirculation was misplacement and or misdirection of the needles by HD staff. The second and third causes were heart failure and decrease in the flow in the fistula (because of stenosis), respectively (1).

The periodic measurement of AR among HD patients has important diagnostic implications and it is well established that high degrees of AR in long term can lead to significant inadequate dialysis among HD patients, which is the most common kind of renal replacement therapy (2-5). On the other hand, inadequate dialysis is an important contributor to lower the overall survival among these patients (4-9).

However, it seems that most of the HD centers forgot periodic measurement of AR among HD patients. It is recommended that any AR should be considered abnormal and prompt investigation should be performed for its causes, if AR exceeded 10% in the urea-based method. It is also recommended that fistulography should be performed among patients with high degree of AR to determine whether stenotic lesions impair access blood flow (4).

The periodic assessment of AR among HD patients is also important for other reasons. A high degree of AR among HD patients is one of the surrogate markers of A-V fistula inflow problems. It is suggested that early de-

tection and treatment of these problems improve long-term A-V fistula patency rates (4, 10).

In contrast to the results of Beladi Mousavi et al. study, the most common cause of AR is the presence of high-grade venous stenosis, which restricts dialyzed blood venous outflow. The other common cause of AR is inadequate arterial blood flow rate when the A-V fistula blood flow rate is less compared to the blood pump of HD machine. In this situation, a part of the dialyzed blood leaving the dialyzer reenters the dialyzer through the arterial side of the A-V fistula to support the blood flow rate set by the blood pump of HD machine. Therefore, solute concentration gradients across the dialysis membrane and the effective clearance obtained in the course of a HD session are reduced (4).

The results of Beladi Mousavi et al. are interesting. According to the results of the study, improper needle placement is the most common cause of backflow or recirculation in their HD center (1). Schneditz et al. have also reported that improper needle placement by HD staff, which is due to the lack of familiarity with the access anatomy is a common source of A-V fistula recirculation (10). Therefore, HD staff should be educated about this issue. Unfortunately, the role of close proximity and improper arterial and venous needles placement by HD staff, are usually being ignored.

It is also recommended that among patients with a new A-V fistula, an access diagram should be obtained from their surgeon (who constructed the access) to aid HD staff for appropriate placement of arterial and venous needles during HD session. The A-V fistula anatomy can also be determined by temporarily occluding the midportion of access. After occluding the midportion of the graft, the portion retaining a pulse is the arterial side of A-V fistula and the other portion is venous limb of access (4).

Acknowledgements

We wish to thank the Chronic Renal Failure Research Center, which helped us complete this dissertation. Without their continued efforts and support, we were unable to bring our work to a successful completion.

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