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Access flow rate and intra-access static pressure for vascular access surveillance

Hyung Duk Kim, Byung Ha Chung, Bum Soon Choi, Cheol Whee Park, Chul Woo Yang, Yong-Soo Kim

Department of Internal Medicine-Nephrology, The Catholic University of Korea, Seoul St. Mary's Hospital, Korea, Republic of

Objectives: The KDOQI clinical practice guideline recommends regular surveillance on vascular access using access flow measurement. And static venous pressure measurement is preferred for graft. However, studies on the efficacy of these techniques are not sufficient. Therefore, we examined whether the access flow rate and static pressure are effective for vascular access surveillance of hemodialysis patients.

Methods: From February 2011 to December 2016, monthly static pressure and access flow rates were measured in patients who underwent dialysis in the dialysis unit of the Seoul St. Mary's Hospital. A total of 115 patients were examined and the total number of measurements was 4727 times. A total of 3966 measurements in 95 patients with fistula and a total of 761 measurements in 20 patients with graft were analyzed. The mean follow up period was 41 months.

Results: 66 patients underwent angioplasty with significant angiography, and total angioplasty was performed 269 times. We evaluated the predictive value of surveillance techniques. The predictive value was 100% and the specificity was 95.9% (p value = 0.000) when the access flow rate falls more than 25% within 4 months.

In the graft group, access flow rate less than 600ml/min showed 50% of the predictive value and 88.5% of specificity. (p value = 0.000) In the fistula group, access flow rate less than 500ml/min showed relatively low predictive value and specificity. (27.4% and 88.5%, respectively, p value = 0.000) A venous static pressure ratio greater than 0.5 showed 18.4% of predictive value and 85.4% of specificity (p value = 0.169) in graft group. And respectively 8.0% and 93.8% (p value = 0.140) in fistula group. There was no statistical significance in both groups.

Conclusions: As recommended in the KDOQI guideline, monitoring the decrease in access flow rate could be the most effective choice for vascular access surveillance.