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Cannulation technique influences arteriovenous fistula and graft survival

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Introduction & Aim: There is a close link between the availability of a well-functioning vascular access and patient survival on hemodialysis. Every effort should be made to maintain the functionality of the vascular access for long-term use. Practices of access cannulation vary from clinic to clinic, mainly for historical reasons. The aim of this study is to investigate the impact of cannulation technique on the survival of the arteriovenous fistula (AVF) and grafts (AVG).

Methods: In April 2009, a cross sectional survey was conducted in 171 dialysis units located in Europe, Middle East and Africa to collect details on vascular access cannulation practices. On the basis of this survey, a cohort of patients was selected for follow-up, inclusion being dependent on the availability of corresponding access survival/intervention data in the clinical database. Access survival was analyzed using the Cox regression model (adjusted for within country effects) defining as events the need for first surgical access survival intervention. Patients were censored for transplantation, death, loss of follow-up or end of the study period (March 31, 2012). Results were adjusted for age, gender and diabetes mellitus.

Results: Out of the 10,807 patients enrolled for the original survey, access survival data was available for 7,058 (65%) of patients, these residing in Portugal, UK, Italy, Turkey, Romania, Slovenia, Poland and Spain. Mean age was 63.5±15.0 years; 38.5% were female; 27.1% were diabetics; 90.6% had a native fistula and 9.4% had a graft. Access location was distal for 51.2% of patients. During the follow-up, 51.1% were treated with antiaggregants and 2.8% with anti-coagulants. Prevalent needle sizes were 15 G and 16 G for 63.7% and 32.2% of the patients, respectively (14 G: 2.7%, 17 G: 1.4%). Cannulation technique was area for 65.8% and rope-ladder for 28.2% and the direction of puncture was antegrade for 57.3%. Median blood flow was 350-400 mL/min.

Conclusions: The study revealed that area cannulation technique, despite being the most commonly used was inferior to both rope-ladder and buttonhole for the maintenance of vascular access functionality. With regard to the effect of needle and bevel direction, the combination of antegrade position of arterial needle with bevel up or down was significantly associated with better access survival than retrograde positioning with bevel down. There was an increased risk of access failure for graft versus fistula, proximal vs. distal location, right arm vs. left arm and the presence of a venous pressure greater than 150 mmHg. The higher HR associated with a venous pressure greater than 150 mmHg should open a discussion on currently accepted limits.

Biography

Maria Teresa Parisotto has obtained her Nursing Diploma in 1974 and the Nursing Management Diploma in 1976 at the Nursing School Ospedale San Carlo, Milan, Italy. She has worked as a Nurse Manager in a Dialysis Unit, Ospedale San Paolo, Milan, Italy. In 1980, she left the hospital and started working as an Application Specialist and Marketing Director Peritoneal Dialysis afterwards in Fresenius Medical Care, Italy. In 1999, she moved to Fresenius Medical Care Headquarters at Bad Homburg, Germany, as Director of Peritoneal Dialysis for Europe, Middle East and Africa. From 2006 to 2016, she has worked in Fresenius Medical Care Deutschland GmbH, NephroCare Coordination as Director Nursing Care Management for Europe, Middle East and Africa. Currently, she is working at Fresenius Medical Care Deutschland GmbH, Care Value Management as Chief Nurse Advisor. Her main areas of interest and experience are vascular access cannulation and care, hygiene and infection control, dialysis processes analysis, safety in dialysis. Her publications focused on peritoneal dialysis, hemodialysis safety and quality and vascular access cannulation and care.

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