ASSOCIATION BETWEEN BLOOD FLOW (Qa) OF ARTERIOVENOUS ACCESS AND MORTALITY IN PREVALENT HEMODIALYSIS (HD) PATIENTS: A FIVE-YEAR PROSPECTIVE STUDY

Ramon Roca-Tey1, Amparo Roda2, Román Martínez-Cercós3, Omar Ibrik2, Rosa Sárron4, Juan Carlos González-Oliva2, Jordi Viladoms2, Jordi Cals2

1Nephrology, Hospital de Mollet, Barcelona, Spain, 2Nephrology, Hospital de Mollet, Mollet del Vallès, Barcelona, Spain and 3Vascular Surgery, Hospital de Mollet, Mollet del Vallès, Barcelona, Spain

INTRODUCTION AND AIMS: It has been suggested that low Qa of arteriovenous access (AV), in the context of underdialysis and/or poor cardiac performance, can be associated with greater all-cause mortality rate (Clin J Am Soc Nephrol 2008; 3:387). The aim of this study is to analyze all-cause mortality in prevalent HD patients (pts) according the Qa of their AV measured during a five-year surveillance follow-up program for early stenosis detection.

METHODS: We prospectively recorded the Qa in 145 AV (fistula AVF 122, 84.1%; graft AVG 23, 15.9%) during HD of 131 pts over 5 year period. The Qa was measured, at least every 4 months, within the first hour of the HD session by Delta-H method using the Crit Line III monitor. The baseline Qa was obtained from two consecutive HD sessions (both values were averaged). The overall Qa was obtained after averaging all Qa measurements recorded. All cases with absolute Qa <700 ml/min or decreased >20% from baseline over time met the positive evaluation (PE) criteria and were referred for angiography and subsequent elective intervention if there was a significant stenosis (luminal narrowing >50%).

RESULTS: Thirty-two pts (24.4%) died during the study period. Cardiovascular was the leading cause of death followed by infection (62.5% and 18.8%, respectively). At baseline, pts who died (PD) were older (71.1±8.0 yr) than pts survivors (PS) (60.2±13.8 yr) (p<0.001). The distribution of AVF and AVG (%) were similar comparing PD (87.5 and 12.5) and PS (83.2 and 16.8) (p=0.56). Mean AV duration (months) and the ratio number of AV/pts were different comparing both groups of pts: 25.6±54.8 vs 35.2±53.2 and 2.00±1.62 vs 1.84±1.42 (p=0.16 and 0.61, respectively). PD showed lower baseline (907.6±398.1) and overall (933.9±393.5) mean Qa (ml/min) compared with PS (1150.8±432 and 1207.3±476.6, respectively) (p=0.005 and 0.002, respectively). At baseline, most AV in PD (53.1%) showed a Qa (ml/min) between 700 and 1500 (1015.7±249.7), 37.5% less than 700 (550.5±84.0) and only 9.4% over 1500 (1723.7±235.9). The last Qa (ml/min) recorded before death (883.8±435.9) showed a positive correlation with the Qa obtained in PD at baseline (r=0.908, p<0.001). Although the incidence of PE was greater for PD than PS (50% vs 27.4%, p=0.016), the percentage of AV with significant stenosis was not different between both groups of pts (37.5% vs 23.9%, p=0.12). The adjusted hazard ratio for all-cause mortality by applying a multivariate Cox regression analysis was 1.280 (95% CI, 1.057 to 1.551, p=0.012) for patient’s age (per 5 yr of increase) and 1.143 (95% CI, 1.009 to 1.294, p=0.035) for Qa at baseline (per 100 ml/min of decrease), indicating that all-cause mortality risk increases by 28% for every 5 yr of increase in age and by 14.3% for every 100 ml of decrease in Qa at baseline.

CONCLUSIONS: 1) The functional AV profile (baseline and overall Qa) was worse in HD patients who died compared with the survivors. 2) In HD patients who died, there was a strong relationship between the baseline Qa and the last Qa recorded before death. 3) In addition to patient’s age, the baseline Qa was an independent predictor for all-cause mortality in prevalent HD pts.

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