

Echoing Insights: Unveiling the Link between Arteriovenous Fistula Parameters and Heart Failure through Ultrasound Dynamics

Viltė Gabrielė Samsonė, Kamilė Čeponytė, Laurynas Rimševičius, Marius Miglinas
Vilnius University, Faculty of Medicine, Vilnius, Lithuania

Background: Arteriovenous fistula (AVF) is the primary access for hemodialysis in end-stage renal disease (ESRD) patients, crucial for long-term dialysis and quality of life. However, AVF function can impact not only dialysis efficacy but also cardiovascular health, particularly the development of heart failure (HF). This study analyzes the correlation between AVF characteristics and heart failure using ultrasound dynamics, aiming to determine how AVF parameters are related to HF progression and patient outcomes.

Methods: Retrospective study included patients diagnosed with ESRD undergoing hemodialysis. Factors influencing kidney function and survival (e.g., diabetes, heart failure, dyslipidemia, BMI) were analyzed. Statistical analysis was performed using IBM SPSS v.29 with both parametric and non-parametric tests. Continuous variables were presented as mean \pm SD or median with IQR, and Kaplan-Meier method with Log-rank test was used for survival analysis.

Results: 34 patients were analyzed (52.9% male) with a mean age of 56.8 ± 14.9 years. HF was diagnosed in 94.1% of patients, with 64.7% having non-congestive HF. Kidney transplantation was performed in 41.2% of patients, and 14.7% had diabetes. Additionally, 41.2% had dyslipidemia. The median BMI was 26.8, and the average time to dialysis was 53.7 ± 15.4 years. Creatinine and pro-BNP levels were highest during AVF procedures, reflecting cardiac stress.

Conclusions: ESRD patients are highly vulnerable to HF and dyslipidemia, both major contributors to mortality. Our study found 94.1% with HF, emphasizing the critical link between kidney and heart dysfunction. Continuous monitoring of AVF function and cardiac health is essential to improving patient outcomes.