Arteriovenous fistulas (AVFs) have been recommended as the preferred vascular access for pediatric patients on maintenance hemodialysis (HD), but data comparing AVFs with other access types are scant. We studied vascular access choice, placement, complications, and outcomes in children” Borzych-Duzalka et al (2019).

Abstract:

RATIONALE & OBJECTIVE: Arteriovenous fistulas (AVFs) have been recommended as the preferred vascular access for pediatric patients on maintenance hemodialysis (HD), but data comparing AVFs with other access types are scant. We studied vascular access choice, placement, complications, and outcomes in children.

STUDY DESIGN: Prospective observational cohort study.

SETTING & PARTICIPANTS: 552 children and adolescents from 27 countries on maintenance HD followed up prospectively by the International Pediatric HD Network (IPHN) Registry between 2012 and 2017.

PREDICTOR: Type of vascular access: AVF, central venous catheter (CVC), or arteriovenous graft.
OUTCOME: Infectious and noninfectious vascular access complication rates, dialysis performance, biochemical and hematologic parameters, and clinical outcomes.

ANALYTICAL APPROACH: Univariate and multivariable linear mixed models, generalized linear mixed models, and proportional hazards models; cumulative incidence functions.

RESULTS: During 314 cumulative patient-years, 628 CVCs, 225 AVFs, and 17 arteriovenous grafts were placed. One-third of the children with an AVF required a temporary CVC until fistula maturation. Vascular access choice was associated with age and expectations for early transplantation. There was a 3-fold higher living related transplantation rate and lower median time to transplantation of 14 (IQR, 6-23) versus 20 (IQR, 14-36) months with CVCs compared with AVFs. Higher blood flow rates and Kt/Vurea were achieved with AVFs than with CVCs. Infectious complications were reported only with CVCs (1.3/1,000 catheter-days) and required vascular access replacement in 47%. CVC dysfunction rates were 2.5/1,000 catheter-days compared to 1.2/1,000 fistula-days. CVCs required 82% more revisions and almost 3-fold more vascular access replacements to a different site than AVFs (P<0.001).

LIMITATIONS: Clinical rather than population-based data. CONCLUSIONS: CVCs are the predominant vascular access choice in children receiving HD within the IPHN. Age-related anatomical limitations and expected early living related transplantation were associated with CVC use. CVCs were associated with poorer dialysis efficacy, higher complication rates, and more frequent need for vascular access replacement. Such findings call for a re-evaluation of pediatric CVC use and practices.

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Reference:
Borzych-Duzalka, D., Shroff, R., Ariceta, G., Yap, Y.C., Paglialonga, F., Xu, H., Kang, H.G.,
Szczepanska, M., Ranchin, B., Holtta, T., Zaloszyc, A., Bilge, I., Warady, B.A., Schaefer, F. and
Maintenance Hemodialysis: Findings From the International Pediatric Hemodialysis Network
(IPHN) Registry. American Journal of Kidney Diseases. April 19th. doi:
10.1053/j.ajkd.2019.02.014.