Alternative Strategies Needed To Improve Vascular Access Outcomes

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Vascular access for hemodialysis, which is essential for adequate dialysis therapy, is taken for granted when functioning properly and is perceived as a terrible annoyance when functioning poorly. The clinical burden and enormous cost associated with maintaining vascular access make improving access survival a critical issue in nephrology. In this issue of CJASN, Erickson et al. explored the relationship between frequency of provider visits and vascular access outcomes (1). The authors hypothesized that more frequent face-to-face visits with physicians and advanced practitioners, which current Medicare incentives encourage, lead to more procedures aimed at preserving arteriovenous (AV) fistulas and grafts, improved access survival, and fewer access-related hospitalizations.

The study used data from the Centers for Medicare and Medicaid Services and followed 63,488 patients who started in-center hemodialysis at age ≥67 years for up to 3 years. Outcomes of interest included the occurrence of interventions to preserve an access, access survival, hospitalizations for access infection, and antibiotic use during outpatient hemodialysis. The authors are to be congratulated on their thorough analyses, appropriate use of methods to account for correlations within patients and dialysis facilities, and assessment of the effect of several sources of potential bias, including reverse causality, through several sensitivity analyses.

The authors found that additional provider visits were associated with a 13% higher odds of an access-preserving intervention, but no improvement in access survival. One additional provider visit per month also was associated with a 9% higher odds of outpatient intravenous antibiotic use and a similar relative decrease in infection-related hospitalizations. These results are disappointing, but not altogether surprising.

There are two essential types of access evaluations that can occur at each patient-provider encounter: access surveillance and access monitoring (2). Access surveillance is defined as the use of additional tools to measure AV access function and may include intra-access blood flow, static venous dialysis pressure, dynamic venous dialysis pressure, recirculation, arterial dialysis pressure (prepump), Kt/V, or Doppler ultrasound. Access monitoring refers to the history and physical examination of the vascular access by the provider, which includes inspection, palpation, and auscultation. These methods are often conflated, which adds to the confusion regarding the effectiveness of each.

Vascular access surveillance can be done remotely: it does not require face-to-face interaction. The ability of access surveillance to improve access survival remains highly controversial. Erickson et al. cite two randomized trials of access surveillance that failed to show any effect on access survival, despite an increase in the number of interventions (3,4). Conversely, access monitoring requires an examination of the access and patient. There is no controversy surrounding the importance of a proper history and physical examination or the ability of its practitioners to predict vascular access dysfunction (5–14). One prospective study included 142 consecutive patients who were referred for AV fistula dysfunction to examine the accuracy of physical examination in the detection of stenotic lesions when compared with angiography (7). There was strong agreement between physical examination and angiography in the diagnosis of outflow (agreement, 89.4%; κ = 0.78) and inflow stenosis (agreement, 79.6%; κ = 0.55). The sensitivity and specificity for the outflow and inflow stenosis were 92% and 86% and 85% and 71%, respectively. These findings demonstrate that physical examination can accurately detect and localize stenoses in AV fistulae.

The physical examinations of the latter study were performed in the interventional suite and not while the patient was on dialysis. A proper physical examination is impossible to perform while a patient is on dialysis. The techniques of the proper physical examination have been well described (2,12). To summarize briefly, the essential components of the examination include inspection, palpation for thrill or pulse throughout the access circuit, and several maneuvers, such as the arm raise and augmentation tests. These cannot be properly performed when there are needles and tape between the provider and AV access, which is the only time in the United States when dialysis patients are evaluated by advanced providers.

In the current reimbursement model for outpatient hemodialysis, providers have an incentive to see patients on dialysis, when the patient’s AV access is cannulated and taped. The requirement of seeing patients on dialysis, when proper AV access monitoring cannot take place, may best explain the association observed between the frequency of provider visits and higher odds of interventions and the lack of association between
provider visits and improvement in vascular access outcomes. As suggested by the findings of Erickson et al., increased provider visits during dialysis may still lead to better recognition of infections and subsequently lower hospitalizations for access-related infections. Access-related infections are a substantial problem, but this benefit may be far outweighed by the additional procedures to preserve a functioning access without any substantial improvement in outcomes.

We fully agree with the authors’ conclusion that the current Medicare incentives are not associated with better clinical results and join their call for alternative strategies and incentives to improve vascular access outcomes.

Disclosures
None.

References

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