Processes of Care and Reduced Mortality among Hemodialysis Patients in the United States

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A major accomplishment of clinical nephrology during the past 15 years has been the substantial improvement in the quality of ESRD care. The proportion of underdialyzed patients in the United States was reduced from >60 to <10% of hemodialysis (HD) patients (1) (www.cms.gov/CPMProject/). Additional improvements have been observed during the past decade in the use of arteriovenous fistulas (AVFs) (2). In turn, better HD care has been associated with decreasing mortality among both prevalent and incident patients with ESRD (3). The association between temporal trends in mortality and better care persists after accounting for changes in other case-mix factors, and Wolfe et al. (4) showed that each 10% increase in the proportion of patients who received adequate HD was associated with a 2.2% decrease in case mix–adjusted mortality rates. These observations about improved quality of care and reduced mortality reflect information provided by a comprehensive, population-based ESRD surveillance system and national registry, composed of 18 regional Networks and the US Renal Data System (5). This surveillance system routinely collects, analyzes, and disseminates information about the occurrence, treatment, and outcomes of ESRD in the US population. The information is used to plan, implement, and evaluate interventions to reduce the occurrence and improve outcomes of individuals with ESRD. Examples of quality improvement interventions are those conducted by the ESRD Networks. The Networks use continuous quality improvement (CQI) to foster transfer and adoption of evidence-based HD practices (6) by ESRD treatment facilities (7). These CQI interventions have been shown to contribute independently to improved care (8,9). This system of data-driven, patient-oriented quality improvement predates its use by the Networks (10), has been widely adopted, and is associated with improved HD care within individual HD systems (11). Demonstrated competence in the application of these improvement methods is a condition of recertification by the American Board of Internal Medicine (12). This experience illustrates how the adoption of best practices is translated into medical practice (13).

CQI assumes that variation in quality is inevitable and amenable to reduction (14,15). For nephrologists, it follows that, despite the marked improvement in care noted, variations in the quality of HD care can be expected despite the high levels of attained HD adequacy, anemia control, and AVF use in US HD populations. Recent reports in CJASN suggest otherwise.

The first report from Lacson et al. (16) applies the concept of “defect free” care (17) to HD. Defining defect-free care as the simultaneous attainment of multiple quality-of-care targets, they reported that individual patients rarely achieve high numbers of individual quality targets at any one time. They evaluated the incremental benefit of achieving up to eight quality-of-care goals among patients treated in >1000 treatment centers. As stated by Lacson et al., “We . . . hypothesized that efforts exerted by medical directors, physicians, and facility care takers to treat and educate individual patients to meet or exceed these targets will reflect on the overall facility-specific indicators and be associated with facility specific . . . mortality rate.” The treatment goals included presence of a venous catheter; adequacy of dialysis; AVF use; and serum albumin, hemoglobin, phosphorous, and bicarbonate levels.

Of note, only 8% of treatment centers approached defect-free care, achieving five or more quality goals per patient; 11% averaged fewer than two goals per patient. Higher number of goals per patient within a facility was associated with lower hospitalization rates and lower mortality (16). Similar results that the quality of overall adequate care is strongly associated with mortality and other outcomes have been reported by a number of other studies, and together these observations suggest that focusing on improving the attainment of multiple quality goals, striving to provide defect-free care, will benefit patients (18–22). The low attainment of defect-free HD care within ESRD treatment centers clearly represents an opportunity to improve care.

Defect-free care may be improved by physicians and staff through new ways of organizing and conducting care within HD treatment centers. An important report in this issue of CJASN by Spiegel and associates (23) suggests how “a coordinated, multidisciplinary environment” may be fostered. The

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authors reasoned that variations among treatment centers in nonpatient, environment-related factors might contribute to mortality differences. They previously developed an exhaustive survey to identify these factors, the Identifying Best Practices in Dialysis (IBPiD) survey (24). IBPiD collected information about 155 factors, including how treatment centers implement policies, staff attitudes toward the center, patterns of communication and coordination among staff members, and environmental attributes of the center.

The report from the IBPiD study examines the association between facility-specific factors and its standardized mortality ratio (SMR). The SMR is a measure of mortality that adjusts for patient characteristics. Spiegel et al. (23) used a 12-month running average of each facility’s SMR reported by the US Renal Data System. Facilities were divided into two strata of low and high mortality, and IBPiD survey items that were associated with high mortality were identified. These factors included two related to center physician practice; three to dietitian practice; and five to facility characteristics, policies, and practices. Multivariable models that included these IBPiD survey items and controlled for patient attributes found that five factors accounted for 31% of the variability in treatment center SMR: Timely multidisciplinary care conferences, dieticians who effectively addressed cultural issues in their diet prescription, and the presence of high-quality medical education programs. These are interesting and noteworthy results that warrant attention by those of us interested in improving the quality of HD care, including by promoting defect-free therapy.

First, before we can understand the contribution of facility-level attributes measured in the IBPiD survey to center outcomes, these findings require replication, ideally in other dialysis populations, to ensure that these observations are generalizable. Second, it would also be of interest to define in more detail what the individual factors actually measure, focusing on modifiable aspects of the survey constructs. Third, it would be important to determine the degree to which the association between the five risk factors and SMR persists after also accounting for adequacy of care measures. It is important to realize that many of these factors may be in the pathways responsible for achieving adequate care. Finally, multidisciplinary interventions to modify these attributes and to evaluate their impact on facility outcomes would be of enormous interest. The target of these interventions might be aggregate measures of defect-free adequacy of HD therapy as discussed.

In conclusion, it is encouraging that, as we move to the next generation of quality improvement in the ESRD system, new quality metrics and new concepts as to how to help clinicians address quality improvement are emerging. Although neither Spiegel et al. (23) and their work with the IBPiD study nor the continued demonstration of the benefits of defect-free care by Lacson et al. (16) can as yet be considered strong evidence, they are a clear demonstration of the continuing commitment by the nephrology community to understanding and addressing factors associated with less than satisfactory patient care and outcomes.

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None.

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