Introduction

G.	Gerald	Schulman
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Gerald Schulman, MD, Vanderbilt University Medical Center, 215 Medical Arts Building, Nashville, TN 37232-1371 (USA)

End-stage renal disease (ESRD) is a critically important and growing health care problem in the United States. Despite advances in the prevention and treatment of renal disease, the annual patient growth rate has averaged 10% in the ESRD program between 1986 and 1989 [1]. By the beginning of the next century, the ESRD population may exceed 250,000. The majority of these patients are currently supported by hemodialysis and this trend is expected to continue. Unfortunately, despite great improvements in the technical aspects associated with delivery of the hemodialysis treatment, the mortality rates for hemodialysis patients in the United States are among the highest in the world, a disturbing trend which has existed for over a decade [2, 3].

The advanced age, frequency of diabetes and other comorbid conditions found in the United States ESRD population are factors implicated in the poor outcome [4, 5]. However, there is great concern that treatment-related factors are also responsible for the excessive mortality. Thus, prescribed therapy that is inadequate or inadequately delivered may be an important cause of mortality; and there is clear evidence that a significant number of hemodialysis patients are not receiving the dose judged to be adequate by the National Cooperative Dialysis Study [6]. Conversely, multiple lines of evidence suggest that there are clear benefits in terms of patient survival as the dose of hemodialysis is increased [7, 9]. Another factor that affects mortality is the nutritional status of the hemodialysis patient [5]. Finally, evidence is emerging that the quantity of dialysis delivered and the nutritional status of the patient are two interdependent variables which impact on survival [10, 11]. Thus, it is timely and appropriate that an issue of the American Journal of Nephrology be dedicated to the hemodialysis prescription.

In this issue, the current mortality data of the United States ESRD population are described, based upon the United States Renal Data System [12]. Depner [13] discusses the importance of quantifying the dose of hemodialysis and Delmez and Windus [14] describe the problems associated with delivery of the prescribed dose of hemodialysis based upon their experience with a group of metropolitan-based dialysis units. Charra et al. [15] describe their experience with the beneficial effects associated with the delivery of high levels of hemodialysis which are not commonly attained in the United States. The impact of the length of the treatment, a neglected treatment parameter, is also discussed. The access remains the ‘Achilles’ heel’ of the hemodialysis treatment. Butterly and Schwab [16] describe methods to evaluate the hemodialysis access to insure that recirculation does not interfere with the delivery of adequate levels of treatment.

Reuse of the artificial kidney has become very common practice in the United States. There are economical as well as clinical reasons for this trend. The advantages and disadvantages of this practice are discussed by Maidment and Petersen [17]. Because of the large volumes required for hemodialysis, water should be considered a drug. The issues related to water treatment for hemodialysis are discussed by Ismail et al. [18]. The potential of delivery of drug therapy during the hemodialysis treatment is discussed in the article by Stivelmann [19].

Finally, Chertow et al. [20] contribute important insights about the importance of adequate nutritional status and the survival of hemodialysis patients and how the prescription of hemodialysis itself impacts upon the nutritional status of the patient. It is hoped that the efforts of the contributors to this issue will provide the reader with insights concerning the necessary requirements to insure safe and effective hemodialysis treatments.

KAHGEK

E-Mail karger@karger.ch Fax + 4161306 12 34

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