PERSPECTIVES IN UREMIA THERAPY

Eli A. Friedman

Downstate Medical Center, Brooklyn, New York 11203, U.S.A.

ABSTRACT

Uremia therapy made possible in 1960's by Scribner has grown to sustain more than 200,000 patients worldwide at a cost in excess of $2 billion annually. Examination of the process by which physician and patient select treatment indicates that geographic, economic, physician and patient bias, and ethical pressures contribute to formulation of the decision. Recognition of these variables facilitates acceptance of evolutionary changes as they take place. Jpn. J. Artif. Organs 12(2), 728-731 (1983)

INTRODUCTION

Irreversible renal failure may be successfully treated by solute extraction using devices, the patient's peritoneal membrane, or a renal transplant.1) In the early 1960's, shortages of trained personnel and limited funding precluded uremia therapy for all but a handful of affluent or politically important patients. Today, however, because of governmental acceptance of the expense of life prolongation, nearly all uremic patients in Western Europe, Japan, and the United States are treated regardless of economic class or resource.2) Assessment of the circumstances determining which treatment shall be given to a specific patient indicates that variables other than proven therapeutic efficacy contribute to the decision making process. These determinants of uremia therapy, listed in Table 1, will now be examined.

GEOGRAPHIC

Residents of remote areas, such as the Faukland Islands, or Nome, Alaska cannot be given center hemodialysis or a kidney transplant at the local hospital because of the absence of services within a three hundred mile radius. Once uremia develops in citizens living in relative isolation, the options for life extension are reduced to self performed on-site regimens such as continuous ambulatory peritoneal dialysis (CAPD), home hemodialysis, or relocation of their home. Compact "travel" dialysis systems such as our attache kidney (Fig. 1) have introduced hemodialysis to regions lacking nephrologists such as the Island of Malta. As a generalization, however, unless the geographically distant uremic patient is rich or politically "well connected," the probability of receiving modern therapy in 1982 is slim.

ECONOMIC

Affluent people have much greater access to health care including uremia therapy than do the poor. Virtually no citizens of China, India, Africa, South America, or Central America are treated by dialysis or renal transplantation for failed kidneys. This reality is not surprising in light of the recognized association between a nation's gross national product and rate of treatment of uremia.3) Even rich countries may undergo budgetary stress in the attempt to provide uremia therapy to all. In the United States, for instance, current debate is weighing the advisability of retrenchment in the federal kidney program,4,5) an action which would once again force triage in deciding "who shall live." Great Britain by allocating lump sum appropriations for health care to cover competing...
Table 1 Determinants of uremia therapy.

| 1) Geographic | 2) Political | 3) Economic | 4) Physician bias | 5) Patient bias | 6) Ethical standards |

![Fig. 1a](image1.png) Attache case portable artificial kidney system weighing 14 lbs.

![Fig. 1b](image2.png) Attache case portable artificial kidney system in use in patient’s home. Note plastic dialysate batch tank to left of case.

Fig. 2 Options in uremia therapy. It is no longer a simple matter to decide on which approach to renal failure is best for the individual patient.

PHYSICIAN BIAS

Every time a prescription is written, a physician exercises bias based on his interpretation of what is optimal for his patient. When in the early 1960’s the only available effective therapy of uremia was hemodialysis, little opportunity existed for physician bias to influence patient treatment. If funding was available, and a dialysis facility was willing to accept the patient, the choice was obvious. Today, with multiple options proven capable of prolonging life in uremia (Fig. 2), decision making is more complex. Patients often are assigned a therapy because of their doctor’s bias rather than as a result of weighing the pros and cons of what might be done.

To illustrate the impact of physician bias consider that in Canada nearly 25% of newly treated uremic patients were begun on CAPD in 1981, while in Europe accomplished nephrologists with long experience in dialysis concluded that “...concrete data is not yet available to justify widespread use of this technique.” By contrast, hemofiltration is expanding rapidly in Europe but is virtually unused in Canada. Other than physician bias, what explanation can be advanced for the differing receptivity of these two novel but underevaluated techniques for treating uremia? Similarly, Japanese nephrologists rarely recommend home hemodialysis (1% of all patients) a means of treatment employed for 40% of patients in Great Britain. Within the United States, home hemodialysis accounts for about 50% of patients in Washington and North Carolina but the national average is below 15%. The point at issue is that after analyzing the same data, divergent
views as to which uremia therapy is preferable are presented to patients because of physician bias. Physicians need to be alert to the risk of converting opinion and anecdotal observations into clinical truths.

**PATIENT BIAS**

Patients may reject their physician's advice. Depressed patients may choose to discontinue what they view as an unsatisfactory quality of life. Diabetics, for example, treated in a program where no dialysis patient lives for two years, have reason to conclude that all treatment plans are futile. Jehovah's Witnesses are proscribed from accepting blood transfusions even to save their lives. Because of bias, some patients persist in requesting further renal transplants after two or three grafts have been rejected. At the other extreme are long term hemodialysis patients in their fifteenth year of treatment who decline a transplant out of fear or conviction.

**ETHICAL CONCERNS**

Given a therapy that is unavailable to all, expensive, and liable to generate large fees (in nonsocialist nations), it follows that all involved in its delivery must come to terms with difficult ethical issues. Should the physician be permitted to select those who will be treated? What of a 95 year old senile patient who develops bladder cancer and uremia? Is it appropriate for a physician to own and profit from dialysis facilities whose patients are referred and maintained by his order? Is dialyzer reuse being expanded as a means of increasing the number of patients treated? Or to raise the per dialysis profit for facilities? Should physicians comply with regulations that permit maintenance dialysis only for patients who agree to receive a kidney transplant?

If hemodialysis is the regimen of choice, under what circumstances is a new treatment to be evaluated? How can informed consent be obtained to try new therapy A or B rather than hemodialysis or a kidney transplant? For the third world for whom contemporary uremia therapy is unattainable, will trails of oral nitrogen binding sorbents, or bacterial enzymes to recycle nitrogenous wastes permit extension of uremia therapy? While solute extraction by machine and modification by enzymes will improve in efficiency, it is safe to predict that kidney transplantation will become safer with a constantly rising success rate. Reevaluation of the potential of xenografting should be the turn of the century permit routine use of animal kidneys for permanent reversal of uremia.

One thing is certain about the future of uremia therapy. It will be strikingly different a decade hence from what is today's standard. Recognition of how the process matching patient and therapy functions should facilitate patient acceptance and implementation of the coming evolution.

**REFERENCES**
