



# *Decision process about options in renal therapy substitution: selection versus election*

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## **BACKGROUND**

Patients with end-stage renal disease are now afforded a variety of choices with respect to renal replacement therapy. They may choose between various forms of hemodialysis, peritoneal dialysis or transplantation. The process of choosing a modality of treatment involves primarily the patient with input from the healthcare team. Health administrators also have interests in this issue because of the high cost of renal replacement therapy. Modality selection should be discussed within the context of the survival and morbidity of a therapy, the quality of life in each therapy and their costs.

A successful renal transplant has been repeatedly demonstrated to give the best quality of life, is the least expensive therapy after the first year and gives better survival than patients who remain on a waiting list<sup>1</sup>. Thus it is the treatment of choice when possible. The remainder of this paper will discuss differences between hemo and peritoneal dialysis.

## **SURVIVAL**

Many papers have been published which discuss the survival of patients on hemodialysis compared to peritoneal dialysis<sup>2-11</sup>. The results have been controversial and quite variable in their results. Reasons for these differences are often difficult to explain and likely include differences in pre-existing comorbidity and differences in the statistical techniques applied to the analysis. Additional differences may be related to the country of treatment. For eg. In the CANUSA study, patients treated in Canada had a 17% lower mortality than those patients treated in the United States even after correction for the

adequacy of dialysis, pre-existing disease and other demographic factors<sup>12</sup>. The explanation for these differences continues to elude investigators. The high utilization of peritoneal dialysis in Canada (approximately 35% at that time) compared with the United States may indicate differences in patient population, physicians and centre expertise. Others have suggested the compliance in Canadian patients is better than those in the United States.

To illustrate the difficulty in survival analyses, consider the Bloembergen paper<sup>9</sup> which analyzed prevalent dialysis patients between 1987-1989 in the U.S. with respect to their mortality on hemodialysis and peritoneal dialysis. In that study, prevalent patients on peritoneal dialysis had a 19% increased relative risk of mortality. In diabetics over the age of 55, that increased to 38%. A re-analysis of patients in the same period, by Vanesh et al, which included both prevalent and incident patients, sees those differences virtually disappear<sup>11</sup>.

In Canada, the Canadian Organ Replacement Registry captures data on all patients treated with renal replacement therapy. In a paper by Fenton et al<sup>10</sup>, patients treated with peritoneal dialysis, compared to hemodialysis, had better outcomes in patients both over and under the age of 65 in non-diabetics and diabetics, although in diabetics over the age of 65, the difference was not statistically significant. Careful analysis of that data shows that peritoneal dialysis during the first 12 months of dialysis confers a particularly large survival advantage to patients. After 24 months, the mortality rate on hemo and peritoneal dialysis became virtually identical. These results from the Canadian registry are consistent with the CANUSA study in which Canadian patients on peritoneal dialysis had a better survival than those in the United States.

In conclusion, survival analyses when comparing modalities are problematic because the results are very sensitive to the method of analysis and the patient population. Adequate correction for co-morbidity is likely inadequate in all studies. There is no ideal analysis, but the intention to treat model is simple and has value for the clinician and patient. Pre-

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sent data do not seem to justify considering either modality as superior, although peritoneal dialysis looks to be advantageous early on in therapy and hemodialysis may be more viable over a longer later period of time. Changing practices make historical comparisons less relevant and thus all data are inadequate in reflecting recent prescription changes, particularly as it relates to peritoneal dialysis. A randomized control trial may not be feasible and registry data will continue to form the basis of these analyses. On balance, using an intention to treat basis for the analysis, it appears that there is likely no difference in survival between hemodialysis and peritoneal dialysis, at least for the first two years.

### MORBIDITY

The major morbidity in hemodialysis patients relates to access failure and complications. In peritoneal dialysis technique failure, peritonitis and exit site infections are the most important morbid events. In both groups, cardiac and vascular disease have a high frequency. Thus the nature of the morbidity in modalities is different and, by extension, is difficult to compare.

### QUALITY OF LIFE

Quality of life has been measured using a variety of indicators including time tradeoff measurements, stress indicators, health impact assessment, Karnofsky scale and more recently the SF 36<sup>13-26</sup>. Overall these studies consistently show better quality of life with a successful renal transplant<sup>25</sup>, but differences between hemo and peritoneal dialysis are not consistent. Home based therapies give a better quality of life than in centre programs, but when corrected for the functional status of the patients the differences are less strong. Thus it is not clear that modality per se has an important impact on the quality of life of the individual, but rather, modality should be chosen to match each patient's lifestyle and particular social set of circumstances.

### COSTS

The costs of the different renal replacement therapies is highly dependent on the country in which the therapy is given<sup>27-29</sup>. In countries where personnel is expensive, then hemodialysis is generally more expensive. However, where peritoneal dialysis solu-

tions must be imported and personnel are inexpensive, for eg. in India, peritoneal dialysis is more expensive. Finally, whether dialysis costs are accounted as revenues or costs to a health system will depend on the reimbursement scheme in a given region.

In summary, with respect to patient survival, morbidity, quality of life and costs, there are differences between peritoneal and hemodialysis, but none that make the modality decision compelling for individual patients.

### INDIVIDUAL PATIENT ISSUES

For an individual patient, modality selection may be determined by their medical circumstance<sup>30</sup>. Peritoneal dialysis is contraindicated when the patient cannot or will not learn the procedure, or when the patient has an useable abdomen and is relatively contraindicated when there is this social instability or a large body weight which makes adequacy targets difficult to achieve. Conversely, peritoneal dialysis is indicated when vascular access is not achievable and relatively indicated when the cardiovascular status of the patient is unstable, there is difficult vascular access, or there are geographic considerations which make access to hemodialysis difficult without a major realignment of the patients living conditions. Hemodialysis is not possible when access is not achievable and is relatively contraindicated when there is hemodynamic instability, difficult access and active bleeding. Hemodialysis is indicated when the patient has failed peritoneal dialysis and when there is active bowel disease, and it is relatively strongly indicated when there is psychological and/or social instability.

In a study of a group of 150 consecutive patients starting dialysis, it was found that 74 patients would have had no medical or social indication for one therapy or the other and thus could have had free choice in making their modality selection<sup>31</sup>. Eighty-three patients went to hemodialysis and 67 patients to peritoneal dialysis. Fourteen patients were felt to have a strong indication to do peritoneal dialysis, 31 patients had indications for hemodialysis and 31 patients were diabetics. Of the 31 in whom hemodialysis was felt to be indicated, this was most frequently for social reasons or they had unuseable abdomens. In the group of 14 patients in which peritoneal dialysis was indicated, 10 had cardiovascular disease, 3 had no vascular access and one was for geographic reasons. Of the 31 diabetics, 14 went to hemodialysis and 17 to peritoneal dialysis. The

most interesting group were those 74 patients who would have had a free choice with regard to modality selection. Of this group 37 (50%) chose peritoneal dialysis and 37 hemodialysis. In summary, in this study there were found to be more contraindications for peritoneal dialysis than for hemodialysis. Amongst those individuals who do have free choice, they divided themselves equally between the 2 modalities.

Another study looking at modality selection after a failed transplant in Canada revealed additional insights into patient choices. In this study, 355 transplant failed in 331 patients between 1985 and 1991. Amongst those 355 patients, 107 chose a modality different from their pretransplant modality. There was net loss to self-care programs. More specifically, 38 patients who were on CAPD prior to their transplant changed to other programs; 30 to centre hemodialysis, 4 to home hemodialysis, 2 to self-care dialysis and 1 to intermittent peritoneal dialysis. Thirty-two patients changed from centre hemodialysis to other modalities; 22 to CAPD, 7 to home hemodialysis, 2 to self-care hemodialysis and 1 to intermittent peritoneal dialysis. The overall gains to CAPD included 22 from centre hemodialysis; 8 who had not had dialysis prior to transplantation, 3 from intermittent peritoneal dialysis and 1 from self-care hemodialysis. The centre hemodialysis gains came from 30 patients transferring from CAPD, 6 from intermittent peritoneal dialysis, 4 from self-care hemodialysis, 4 from home hemodialysis and 4 patients who were not previously on dialysis.

This very large percentage of patients changing treatment modality after a failed renal transplant could not be explained by medical reasons alone. It implies that there were psychological needs in these patients, including a need for support, thus the decrease in self-care programs. It may also indicate a need for an overall change in the lifestyle for the patients after the trauma of a failed transplant. This is speculation and further studies need to be undertaken to better understand these patient choices.

Finally, a study looking at modality selection by patients and staff helps to give some insight into patient decision-making<sup>32</sup>. Forty-four patients, nurses and physicians were interviewed to identify factors that were relevant to modality selection. The factors deemed most important in making that decision include the independence of the patient, peritonitis, the presence of the catheter in the abdomen, the need for vascular access (plus potential multiple revisions), dietary restriction, the loss of the ability to immerse and the need for needling. Other more remote complications of therapy such as changes in lipid status were not strong determining factors. Va-

lued most in peritoneal dialysis was the independence and relatively free diet that it granted. The most feared event in peritoneal dialysis was peritonitis. In hemodialysis the exposure to staff and patients was its most positive feature and the most negative aspect of this modality included the loss of independence, the need for needling, access failures and dietary restrictions. Thus in this study, it would appear that modality selection is a mix of medical and non-medical considerations.

## SUMMARY

No renal replacement therapy stands alone. Hemodialysis, peritoneal dialysis and transplantation each have a role to play in the care of our patients. When one fails, another can replace that modality. Patients and staff should be counselled accordingly. The responsibility of healthcare workers is to try to best match the medical condition and lifestyle of the patients with the renal replacement therapy available. Furthermore the patients should have sufficient information to be able to make these decisions wisely.

## SELECTION VERSUS ELECTION

- Healthcare givers should select where medical conditions preclude a choice of renal replacement therapy.
- Patients should elect otherwise, having been given information.
- Administrators should be cognisant of the issues but not integral to the decision-making process.

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