

Control And Outcomes In The Hemodialysis Setting

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Abstract

Broad Long Term objective:

To improve the longevity of chronic hemodialysis patients

Specific Aims:

To test the hypothesis that giving hemodialysis patients the ability to control their treatment schedule, frequency, and duration of dialysis treatments improves their outcome. Where outcome is measured by; 3 year survival, adequacy of dialysis, and mental outlook.

BACKGROUND

HEMODIALYSIS

Home dialysis and related donor transplantation are generally the preferred modes of therapy for end stage renal disease, because they allow for maximum patient rehabilitation and survival [Rosansky 1983]. Choice of treatment modality for patients with end-stage renal disease ideally should not only increase the chances of survival but also improve quality of life and facilitate rehabilitation goals. These goals include employment, enhanced physical functioning, improved understanding of dialysis, increased control, and resumption of activities enjoyed before dialysis. Home hemodialysis has been consistently associated with improved long-term patient survival and quality of life compared with patients treated with in-center hemodialysis or peritoneal dialysis. Cumulative home hemodialysis survival is 17% at 28 years [Delano 1996]. Home hemodialysis is also well suited to rehabilitation. Home hemodialysis training programs educate patients and partners to become responsible for dialysis treatments, thus encouraging independence and permitting flexible scheduling, which promotes greater participation in exercise and employment [Oberly 1996]. In the United States, from 1983 to 1993, home hemodialysis use has decreased from 6% to 1.3% of the dialysis population [Mailloux 1996]. Most home hemodialysis programs have withered away because of current patient mix, increase in Continuous Ambulatory Peritoneal Dialysis, proliferation of outpatient centers, disinterest in nephrologists, and fear of self-cannulation by patients. The home hemodialysis patients were younger,

with a median age of 44 versus 59 years for in-center hemodialysis patients, and had less comorbidity. The home hemodialysis group had fewer diabetic patients and no renal vascular patients. The 5-year and median survival estimates were significantly better for the home hemodialysis patients versus other dialysis modalities. When matched by age, sex, and end-stage renal disease diagnosis to corresponding in-center hemodialysis, the home hemodialysis patients still had significantly better survival rates, but the home hemodialysis patients had less comorbidity [Mailloux 1996]. In conclusion, home hemodialysis patients survive longer and have better rehabilitation than other dialysis patients.

CONTROL AND HEALTH OUTCOMES

The relevance of decision latitude and ability to control ones environment as a factor in health outcomes has been validated in the work environment by Karasek [Karasek 1979]. The importance of control in the workplace was demonstrated by correlation of decision autonomy and skill discretion questions, such as; "Do you have a lot of say in your job?", "Is there variety in your tasks?", with eventual measures of health outcomes. As such the possibility that similar levels of control and decision latitude are the basis through which home hemodialysis patients determine their better outcomes merit specific investigation.

STUDY DESIGN

A prospective cohort design study would allow the selection of matched home and in-center dialysis patients which could then be followed for a period of time (3 years) to assess the end outcome. Study Population should have similar

distribution of white and nonwhite patients, cause of renal failure [Mailloux 1994], and age since each of these variables are known to correlate with mortality [Held 1987], and if possible mental status level of depression. Variables that would not be critical to match include education level since survival rates for patients with less than ten years of education were not significantly different from those with formal education as high as the university graduate level [Roberts 1976].

Independent variables to be evaluated would include; measures of adequacy of dialysis (BUN, Creatinine, URR, interdialytic weight gain), measures of general health status (via the SF21, Karnofsky score [Husebye 1987] , number of days hospitalized over prior 12 months (since the frequency can be measure of general health status [Rubin 1988])), measures of mental status, since level of depression has been correlated with outcome [Burton 1986], and measures of SES (educational level,

income, whether on SSI/Social security disability, insurance; private vs medicaid).

Dependent variables are; the level of control which will be measured by use of the job content questionnaire of Karasek [Karasek 1985], and measures of schedule frequency by measuring variation (each time the pattern in home treatments is broken per month over 12 months).

POWER CALCULATION

The basic design is to look for a 20% difference in survival which is estimated at; 89% at 5 years for home patients while in-center hemodialysis patients had a 5-year survival of 39%. As such 37 home dialysis patients and 148 in-center matched controls would have 95% power to detect a 20% difference in survival.

LIMITATIONS

THREATS TO VALIDITY

The ability to work is easier in home population-because schedule can be on off hours, and as such the rewards of being able to work may have indirect impact on the improved outcome of home patients. In addition since survival is associated with a coping spouse, which is more likely in home patients [Farmer 1979] this may play a role in outcomes. In addition home hemodialysis may play a self-selection in choosing patients more interested in ones own health status, e.g. active players versus passive health consumers.

BIAS

Socioeconomic factors such as the having the necessary space for home hemodialysis are easier for wealthier patients, the ability to pay for utilities (water, electricity) necessary for home hemodialysis patients also is easier for wealthier patients. In addition reasons for better survival in addition to a younger age and more favorable ESRD diagnosis may include less comorbidity, more patient involvement, and longer dialysis time [Mailloux 1996]. Lastly, patients who dialyzed themselves at home-with a relative or friend to help-had much better results than those who were dialyzed at the center. This in part reflects the selection process, since patients with severe medical problems usually weren't allowed to try self-dialysis [O'Brien 1976] . Despite covariate analysis that patient survival on dialysis therapy was not influenced by race, sex, or marital status. Patients more than 60 years of age and patients with renal failure secondary to diabetes mellitus or hypertension had the worst survival on dialysis [Rubin 1989]. Hence these patients would be less likely to undergo home dialysis due to more medical complications and complexity in their dialysis prescription.

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