

Review Article

Implications for Clinical Practice for Patients with End Stage Renal Disease

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ABSTRACT

Background: Patients with end-stage renal disease (ESRD) are encountered in the Emergency Department with problems related to the metabolic complications of renal disease or dialysis complications.

Methods: This review of literature highlights the concerns related to patients with ESRD and implications for clinical practice.

Results: The concept of illness perceptions and locus of control regarding ESRD is useful in understanding the impact of ESRD and of dialysis treatment on the health related quality of life.

Conclusion: Delayed diagnosis of ESRD and failure of recognition of renal disease lead to slow progression of renal failure result in a predominantly young ESRD population leads to poor coping and depression among patients with ESRD.

Key-words: chronic renal disease, ESRD, dialysis, renal impairment, prevention, rehabilitation.

INTRODUCTION

Chronic renal failure (CRF) requiring dialysis or transplantation is known as end-stage renal disease (ESRD) (Cabañas et al., 2010; Montgomery et al., 2009). In the United States, diabetic nephropathy, hypertension and glomerulonephritis are common causes of CRF with 75% of all adult cases. All major organ systems are affected by renal failure. Prevalence of symptoms is a function of the glomerular filtration rate (GFR), which averages 120 mL/min in a healthy adult. As the GFR falls to less than approximately 20% of normal, symptoms of uremia may begin to occur. They almost are invariably present when the GFR decreases to less than 10% of normal. Signs and symptoms of renal failure are due to overt metabolic derangements resulting from inability of failed kidneys to regulate electrolyte, fluid,

and acid-base balance; they are also due to accumulation of toxic products of amino acid metabolism in the serum.

The principle causes of ESRD are diabetic nephropathy, hypertensive nephropathy, chronic pyelonephritis, autosomal polycystic kidney disease and obstructive uropathy (Mani, 2003). Over 50% of these diseases possibly could be prevented if an effort was made; millions of Indians suffer from diabetes and hypertension and are unaware of their illness. Even if they know they have one of these diseases, there are often few symptoms, and they therefore do not take treatment. The significance of CKD is attributable to five factors: the rapid increase in its prevalence, the enormous cost of treatment, recent data indicating that overt disease is the tip of an iceberg of covert disease, an appreciation of its major

role in increasing the risk of cardiovascular disease and the discovery of effective measures to prevent its progression. These factors render CKD an important focus of healthcare planning even in the developed world, but the problems they delineate in the developing world are far more challenging. Delayed diagnosis and failure of institution of measures to slow progression of renal failure result in a predominantly young population with end-stage renal disease (ESRD). Some 85% of the world's populations live in low-income or middle-income countries, where the clinical, epidemiological and socioeconomic effects of the disease are expected to be the greatest.

Review

A family history of kidney disease is associated with an increased risk for end-stage renal disease (ESRD). Mean age was 43.2 years, 41.0% of respondents were men, 20.1% were black, 6.6% had diabetes, 21.4% had hypertension, 1.6% had a personal history of kidney disease, and 3.7% reported a family member with ESRD. Although blacks were more likely to report a family history of ESRD (odds ratio, 6.43; 95% confidence interval, 2.02 to 20.43), their perception of risk was not greater. Blacks are approximately 6 times as likely to report a family history of ESRD independently of a personal history of kidney disease, diabetes, or hypertension, they do not perceive themselves as more vulnerable for kidney disease (Jurkovitz, Hylton, & McClellan, 2005). Compared to 91 hemodialysis HD patients, 42 peritoneal dialysis PD patients of end stage renal disease (ESRD) experienced more personal control and had a better understanding of the illness (Timmers et al., 2008). Illness perceptions explained from 17 to 51% of the variance in quality of life scores. Interventions aimed at providing more knowledge about ESRD and dialysis, and provision of skills to coping with the illness and its consequences may improve quality of life in dialysis patients.

Spouses and other proxies consistently rate patient quality of life (QOL) lower than patients rate it themselves. Spouses of patients with ESRD rated all patient characteristics, including QOL, as worse than did the patient with ESRD. Change in perceptions of patient's mood and their subjective health predicted both patient and spouse ratings of patient QOL. Change in spouse's perceptions of patient's functional ability predicted spouse ratings of patient QOL, but not the patient's own ratings. Change in the spouse's own QOL explained additional variance in their rating of the patient's QOL. Patients and spouses perceive patient QOL and predictors of patient QOL differently (Ferri & Pruchno, 2009).

The age- and sex-adjusted prevalence of CKD among the Zuni Indians chronic kidney disease aged ≥ 20 year ($n = 1113$) of New Mexico was >2.5 -fold higher than that among the US composite population (Scavini et al., 2007). The estimated prevalence of CKD stages 1 and 2 combined was three- to four-fold higher than that of CKD stages 3 and 4 combined. This ratio was significantly higher than that in the US composite population (1.4-fold). The prevalence of CKD stage 5 was eight-fold higher among the Zuni Indians than among the composite US population. The Zuni Indians have an expanded pool of CKD that contributes to the high burden of ESRD. The high prevalence of CKD stages 1 and 2 provides a unique opportunity to develop innovative treatment programs to reduce the burden of CKD in Zuni Pueblo. There is no data on the true incidence and prevalence of chronic renal failure in the developing world.

Chronic renal failure (CRF) is a debilitating condition responsible for high morbidity and mortality and is a financial burden on government and society (Agarwal, Dash, Gupta, & Pandey, 2009). Because of its costs and the complexity of its treatment, proper care is available to very few patients in India. Thus, the prevalence of CRF in that adult population was 0.785%

or 7852/million. In the absence of national registries, no reliable data are available on the incidence and prevalence of end-stage renal disease (ESRD) in India. The incidence of ESRD is likely to be higher than that reported from the developed world, with chronic glomerulonephritis being the most common cause, accounting for more than one third of patients, while diabetic nephropathy accounts for about one fourth of all patients in India. Patients are generally younger (mean age 42 years) at the time of detection of ESRD and two-thirds first see a nephrologist after they have reached end stage. Treatment of ESRD is a low priority for the cash-strapped public hospitals and in the absence of health insurance plans, less than 10% of all patients receive any kind of renal replacement therapy.

Chronic kidney disease (CKD) and end-stage renal disease (ESRD) are emerging public health problems in developing countries, and need changes in health-care policy (Jha, 2009). ESRD incidence data are not available from large parts of the developing world including South Asia. They report the ESRD incidence in a large urban population in India. ESRD incidence was estimated for four consecutive calendar years (2002–2005) among 572029 subjects residing in 36 of the 56 wards of the city of Bhopal.

Chronic kidney disease (CKD) afflicts a large number of younger minority adults receiving medical care in settings that serve the uninsured and underinsured (settings collectively known as the healthcare safety net). Poor, minority adults with moderate to severe CKD are also two to four times more likely to progress to kidney failure than non-Hispanic whites. At 2 year, the unadjusted mortality rate was 6.6% among 12,568 patients in the United States on peritoneal dialysis (PD) patients compared with 6.9% among hemodialysis (HD) patients (hazard ratio [HR] 1.01; 95% confidence interval [CI] 0.82 to 1.23) (Inrig, Sun, Yang, Briley, & Szczech, 2006). Although choice of initial dialysis modality

seems to be associated with equivalent outcomes among patients who have ESRD and are placed on the transplant waiting list, patients with BMI ≥ 26 kg/m² have increased 2-yr mortality associated with the selection of PD versus HD.

A steady increase in prevalence of chronic renal insufficiency or end-stage renal disease (ESRD) incidence is a worldwide public health crisis in the United States (Hsu, Vittinghoff, Lin, & Shlipak, 2004). The result reveals that from 1978 to 1991, the number of adults age 20 to 74 years with chronic renal insufficiency (estimated glomerular filtration rate, 15 to 59 mL/min per 1.73 m²) and new ESRD cases) increased from 2.6 to 3.9 million, an increase in prevalence from 1970 to 2460 per 100 000 persons. For every 1000 adults with chronic renal insufficiency in 1978, 9 new cases of ESRD developed in 1983, but every 1000 adults with chronic renal insufficiency in 1991 produced 16 new cases of ESRD in 1996 (relative risk, 1.7 [95% CI, 1.1 to 2.7]). They concluded that during the period examined, growth in incident ESRD outpaced growth in prevalent chronic renal insufficiency, demonstrating that the ESRD epidemic in the United States is not merely a function of more cases of kidney disease. The study indicates that targeted efforts to assess the burden and progression of CKD within the healthcare safety net are vital to improving the quality of care for this vulnerable population, and ultimately save lives.

Chronic renal failure is a devastating medical, social and economic problem for patients and their families. Renal replacement therapy (RRT) is a low-priority area for healthcare planners in developing nations with two-tier healthcare delivery system. There is a severe shortage of nephrologists and hospitals offering dialysis and transplantation, more so in the poorest regions. There is a direct relationship between the number of dialysis centers and per capita gross national income of developing nations. Shortage in the number of government-funded hospitals has fanned

the growth of a large number of private hospitals offering RRT. The high cost of hemodialysis (HD) puts it beyond the reach of all but the very rich and maintenance HD is the exclusively preserve of private hospitals. Government-run hospitals are busy with renal transplantation, which is the only realistic long term RRT option for a majority of patients. There are no state-funded or private health insurance schemes and patients have to raise finances for RRT on their own. Entire families are involved in such endeavors, with resulting loss of income of other family members(Jha, 2004).

A number of measures are utilized to bring down the RRT costs. For HD, these include cutting down the frequency of dialysis, use of cheaper cellulosic dialyzers, dialyzer reuse and non-utilization of expensive drugs like erythropoietin. Paradoxically, chronic peritoneal dialysis is more expensive than HD; patients use outdated connection systems and are sub optimally dialyzed on 3 exchanges/day. Most patients on dialysis are inadequately rehabilitated. More than 1.5 million people currently are undergoing renal replacement therapy (RRT) and the number is forecasted to double within the next 10 years (World Kidney Day). The cumulative global cost for dialysis and transplantation over the next decade is predicted to exceed \$1 trillion. In the lowest-income countries where, realistically, most patients will not have access to RRT, prevention will be the key objective (Jha, 2009).

Preventive interventions must be compatible with limited government revenues and health expenditure. In some countries the cost of dialysis is many times greater than the average per capital annual income of people. In addition, the location of HD centers in primarily urban areas makes rural patients travel long distances for HD therapy. The transportation time and costs can have a significant impact. Because resources to address public health issues and research-advanced treatments are limited, it is important for organizations to engage in sustainable economic practices. With

limited government budgets, developing countries need to take advantage of all the international programs and grants available from public and private sources. Experts urge developing countries to look beyond their borders and research available grants, programs and private monies available to fight ESRD.

Less than 0.1% of Canadians have ESRD; however, the disease generated direct health-care costs of \$1.3 billion in the year 2000. The amount of direct spending per person with ESRD is much more than the average spending per person for all health-care conditions. Adding indirect morbidity and mortality cost brings the total burden associated with ESRD to \$1.9 billion. This economic impact is higher than that for skin or infectious diseases, about the same as for genitourinary or endocrine diseases, but lower than that for conditions such as cancer or stroke. This economic weight is borne by a relatively small number of individuals. With the rapid increase in the incidence of ESRD, these findings may be useful in setting priorities for research, prevention programs, and in the planning of treatments(Zelmer, 2007).

A better understanding of the scope and magnitude of the total economic burden of ESRD would help to inform those making policy decisions (Kidney International (2007). Live related donor transplantation was the least costly and had the greatest survival time, while center hemodialysis had the poorest cost-effectiveness (Stephen d. Roberts et al. (2006). By simulating changes to the present system of care, we found that shifts from center dialysis to either home dialysis or cadaver donor transplantation would save \$7000 to \$8000 per life year, or \$284 million per year for the existing end-stage renal disease population. However, if legislative changes fail to produce real shifts from center hemodialysis, costs will increase. The substantial costs for end-stage renal disease can be contained by shifting from the widespread use of center hemodialysis. The economic burden of ESRD in the year after

onset is substantial, particularly among patients with diabetes (Roberts, Maxwell, & Gross, 1980).

RESULTS AND DISCUSSION

End-stage renal disease (ESRD) patients undergoing dialysis face much stress and have to make adjustments in their lives to optimize health and improve quality of life. Renal rehabilitation program-including pre dialysis education, in center training, and community rehabilitation-in the dialysis unit. The economically cheaper nursing intervention (Pre dialysis education and relevant exercise and follow up, reassurance) reduces the economically burdened disease condition (ESRD). Nurses working round the clock with the patients and they are in our hands, better we take them and mold them to overcome the discomfort there by help them to have a near normal life. Hence a multidisciplinary, coordinated care approach is required to control the escalating healthcare costs associated with this disabling and often fatal disease. (Felice, 2010).

Rehabilitation of dialysis patients was an original goal of the Nursing care. End stage Renal Disease (ESRD) program, and there is a growing recognition that the key to the continued wellness of these patients' lies in helping them realize their optimum level of functioning. Benefits associated with successful rehabilitation include a better quality of life, reduced health care costs, and fewer demands for support from care providers. Success of a rehabilitation program depends to a large extent on the efforts of a team composed of health care professionals such as nurses, physicians, pharmacists, and dietitians, social service providers such as social workers and vocational counselors and most important- the patients themselves. (Crampton, Solomon-Dimmitt, Intrieri, Schrag, & Snyder-Manson, 1998)

Opportunities for rehabilitation have been limited by patient fatigue and frailty but a number of therapeutic advances have contributed to changes in the outlook for

rehabilitation. For example, improvements in dialysis equipment and opportunities for home rehabilitation programs have increased the freedom and overall quality of care for dialysis patients. Perhaps the most significant factor contributing to increased opportunities for rehabilitation has been an enhanced ability to control the anemia of ESRD, which has been shown to be at least: partially responsible for many of the debilitating symptoms associated with renal failure, including fatigue, hypothermia, lack of energy, anorexia, depression, decreased libido, and a reduced tolerance for exercise. Partial correction of anemia with Epoetin alfa has been shown to yield improvements in a number of areas that are essential to rehabilitation efforts, including aerobic exercise capacity and muscle strength. (Crampton, et al., 1998)

People on dialysis can significantly influence their own long-term outcomes. However, dialysis professionals can have a major impact--positive or negative--on how patients deal with the life changes caused by kidney failure and its treatments. The role of the healthcare professional is to encourage and, where possible, to enable patients to accept responsibility for their health and well-being and to fulfill their obligations within the family and society. Prospects for renal rehabilitation increase if dialysis staffs convey a positive attitude and show a belief in patients' potential to live long and well on dialysis. In addition, staff encouragement toward rehabilitation goals helps patients form positive attitudes that will allow them to participate actively in life. Further, staff can provide valuable information on a wide range of topics- particularly things patients are able to control, like adherence, exercise, and self-care. At the facility level, adjustment can be aided by offering flexible dialysis schedules, work-related goal-setting, and referral to vocational rehabilitation as well as opportunities for patient-to-patient communication and meaningful staff interaction (Staton, Shuy, & Byock, 2001).

The nurse education must aim to enable student nurses gain skill required to be able to practice the psychosocial principles in setup where highly technological interventions are carried out. Early education about renal disease, its treatments, and the potential to live long and productively can aid in overall adjustment and decision making for people on dialysis. More specifically, learning about topics including kidney failure, treatment choices, medications, and the renal diet can help dialysis patients maintain a sense of control, a factor linked to improved adherence and life satisfaction (Uttley & Prowant, 1994). Education was shown to be a positive predictor of physical and mental health for people on hemodialysis. Informed patients have also reported fewer symptoms as well as more confidence in their ability to manage the symptoms they do have. Encouragement, especially from families and dialysis staff, can increase patients' autonomy, control, and participation in treatment. Patients who are encouraged to learn about their treatment have better outcomes and improved quality of life. Such patients may take more responsibility for things they can control, including exercise, remaining actively engaged in life, and sticking to the renal meal plan. The support patients received from their families and dialysis staff was a major factor in promoting employment- an activity that contributes to emotional health (Falvo, 2004).

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