

## Implications for Clinical Practice for Patients with End Stage Renal Disease

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### Abstract

Renal failure is considered as a major complication that may affect major organs and systems. The patients, diagnosed with end-stage renal disease (ESRD), are encountered with problems related to the metabolic complications of renal disease or dialysis complications. The study has aimed to investigate the implications of clinical practices for patients suffering from end stage renal disease. This review has highlighted the concerns related to patients with ESRD and implications for clinical practice. The concept of perception and control regarding ESRD is useful to understand the effect of ESRD and dialysis treatment on the health of patients. Renal failure is likely to progress as a result of delayed diagnosis of ESRD and failure of diagnosing renal disease, resulting in a predominantly young ESRD population. It leads to poor coping and depression among the patients. The awareness about kidney failure, medications, renal diet, and treatment choices is helpful for the patients to maintain sense of control and life satisfaction.

**Keywords:** Dialysis, End Stage Renal Disease (ESRD), Kidney Failure, Metabolic Complications, Rehabilitation, Renal Insufficiency

### 1. Introduction

Chronic Renal Failure (CRF) is a serious public health condition, which can worsen if not treated resulting in End-Stage Renal Disease (ESRD). Dialysis becomes mandatory for the patients suffering from ESRD. In United States, diabetic nephropathy, hypertension, and glomerulonephritis are common causes of CRF with 75% of adult cases (Montgomery et al., 2009; Cabanas et al., 2010). Renal failure is responsible to affect all major organs and systems of human body. On average, the Glomerular Filtration Rate (GFR) is 120 mL/min in a healthy adult. The symptoms of uremia are represented when GFR decreases <20% below normal. However, when the GFR decreases to <10% below normal these symptoms are invariably present. The apparent metabolic derangements as a result of inability of kidneys to regulate acid/base balance, electrolytes, and fluids represent the signs and symptoms of renal failure. The normal functioning of kidney is also affected the accumulation of toxic products of amino acid metabolism in the serum (Montgomery et al., 2009; Cabanas et al., 2010).

The conditions including autosomal polycystic kidney disease, diabetic nephropathy, chronic pyelonephritis, hypertensive nephropathy, and obstructive uropathy are considered as the principle causes of ESRD. Nevertheless, it is believed that over 50% of these diseases can be prevented,

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if proper precautions are taken (Mani, 2003). There are millions of individuals, who suffer from hypertension and diabetes but are not aware about the condition. Millions of Indian citizens suffer from diabetes and hypertension, but are unaware about their illness. However, they do not take the recommended treatment even when the disease is diagnosed. The factors that are attributed to signify chronic kidney disease (CKD) include;

- Increased prevalence
- Massive treatment cost
- Increased risk of cardiovascular disease
- Prevent progression through discovery of effective measures

In the developed countries, these factors have rendered CKD as a significant factor for healthcare planning, however, its demarcation in the developing world is far more challenging. The delayed diagnosis and failed institutional measures result in ESRD among the predominantly young population.

### *1.1 Problem Statement*

The impaired renal function is considered as the independent risk factor for cardiovascular disease. Although, there are various risk factors that play an attributable role in the development of ESRD; however, the exact interactions and mechanisms remain unclear. Therefore, this study has investigated and explained the implications for clinical practice among patients suffering from ESRD.

### *1.2 Aim of the Study*

The study has aimed to evaluate the implications for clinical practice among patients suffering from ESRD.

## **2.Literature Review**

Chronic Renal Failure (CRF) is known as an enervating condition, which is likely to result in high morbidity, mortality, and financial burden on government as well as the society (Agarwal et al., 2009). There is increase in the incidence of ESRD than reported in the developed world. Chronic glomerulonephritis affects more than one third of patients and is regarded as the most common cause of ESRD. On the other hand, diabetic nephropathy accounts for about one fourth of all patients (Agarwal et al., 2009). Chronic kidney disease and end-stage renal disease are emerging public health problems in developing countries, and need changes in health-care policy (Jha, 2009). The data, about incidence of ESRD, is not available from many parts of the developing world, including South Asia. CKD burdens a large number of individuals receiving medical care in settings, known as the health-care safety net. The individuals suffering moderate to severe CKD are at higher risk to suffer kidney failure as compared to non-Hispanic whites.

A study conducted in United States revealed that mortality rate among patients undergoing peritoneal dialysis (PD) was 6.6%; whereas, mortality rate among patients of hemo-dialysis (HD) was 6.9% (Inrig, et al., 2006). There is significant association between the modality to choose the initial dialysis and equivalent outcomes among the patients suffering ESRD and are advised for kidney transplantation. However, on the basis of the selection of PD and HD, the patients with BMI  $\geq 26$  kg/m<sup>2</sup> have increased rate of mortality. Increase in the incidence and prevalence of ESRD chronic renal insufficiency is a public health issue across the world (Hsu et al., 2004). However, the prevalence of chronic renal insufficiency has been out-spaced as a result of increase in incidence of ESRD. Moreover, the study indicated the targeted efforts, required to assess the burden and progression of CKD by improving the quality of care and save lives.

The family history of kidney disease is associated with an increased risk for ESRD. A study recruited individuals with mean age of 43.2 years; out of which, 41% 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. The perception of blacks related to the risk was not greater; although, they were more likely to report a family history of ESRD. According to Jurkovitz et al. (2005), there is 6 times increase in developing kidney disease, hypertension, and diabetes among the blacks due to family history. As compared to hemodialysis (HD) patients, the peritoneal dialysis (PD) patients of end stage renal disease (ESRD) had a better understanding of the illness (Timmers et al., 2008).

The Zuni Indians suffering chronic kidney disease aged  $\geq 20$  years of New Mexico was >2.5-fold higher as compared to US composite population (Scavini et al., 2007). There was three to four fold increase in the estimated prevalence of

CKD stages 1 and 2 as compared to CKD stages 3 and 4. There was significant increase in this ratio among different countries except for US composite population (1.4-fold). As compared to the US population, the prevalence of CKD at stage 5 was increase to eight-folds among the Zuni Indians. The increased prevalence of CKD among the Zuni Indians significantly contributes towards the development of ESRD. A distinct opportunity for starting treatment is provided at CKD stage 1 and 2 to reduce burden.

Apart from medical problem, chronic renal failure tend to create a devastating social and economic problem for patients as well as their families. The shortage of government funded hospitals have resulted in large number of private hospitals that offer RRT. Majority of the patients suffering kidney failure need transplantation that is among the options of RRT; however, the hospitals run by the government are mostly concerned with renal transplantation. The absence of state funded and private health insurance schemes has forced to raise finances for RRT (Jha, 2004).

The cost of RRT has been decreased through the adoption of different measures that include; decrease in the frequency of dialysis, use of cheap cellulosic dialyzers, reusing dialyzers, and avoiding expensive drugs like erythropoietin. Comparison between HD and chronic peritoneal dialysis showed that chronic peritoneal dialysis is more expensive because the patients use outdated connection systems and were dialyzed on 3 exchanges/day. Moreover, there is inadequate rehabilitation among the patients undergoing dialysis. At present, more than 1.5 million people are undergoing RRT; however, the number is likely to double within the next 10 years. In the next decade, the cumulative global cost for dialysis and transplantation is likely to exceed \$1 trillion (Jha, 2009).

A study conducted by Drion et al. (2012) recommended careful management of ESRD that include nutritional inputs and dialysis. Dialysis needs to be started early, when constantly low levels of GFR are recorded. It tends to possess tremendous healthcare cost implications. Mortality is likely to be predicted on the basis of nutritional factors, age, and comorbidities before starting with the procedure of dialysis. Adequate nutritional management needs to be implemented well before pre-dialysis stage or start of dialysis procedure to improve health of the ESRD patients.

The preventive interventions, required for patients suffering kidney diseases, need to be compatible with limited government revenues and health expenditure. In some countries, the cost of dialysis is greater than the average per capital annual income of the people. Moreover, the patients in rural areas needed to travel long distances to reach HD centers for HD therapy. The time and cost invested in transportation had significant impact on the patients acquiring HD therapy. The engagement of organizations with sustainable economic practices is important due to limited resources for addressing public health issues and research-advanced treatments. The developing countries need to take advantage of all the international grants and programs available from private and sources; despite of limited government budgets. In order to fight against ESRD, the developing countries are need to look beyond their borders and acquire the available grants, programs, and private monies.

According to Zelmer (2007), direct health care cost of \$1.3 billion in 2000 has been generated by ESRD disease with approximately 0.1% affected Canadians (Zelmer, 2007). There is an increase in the amount of direct spending per person with ESRD as compared to the average spending per person for other health conditions. A total cost associated with ESRD has been brought to \$1.9 billion that is an indirect cause of morbidity and mortality (Zelmer, 2007). Skin and infectious diseases increase the economic impact, which is associated with genitourinary diseases, endocrine diseases, stroke, and cancer. These findings help to set priorities for research, preventive programs, and planning of treatments to control the increase incidence of ESRD.

Effective policy decision can be made through better understanding of the scope and magnitude of the total economic burden caused by ESRD might help in making effective policy decisions. Greatest survival time is rendered through living related donor transplantation that is not costly; while, hemodialysis conducted at health care center has the poorest cost-effectiveness (Roberts et al., 1980). The dialysis conducted for the existing ESRD at home or cadaver donor transplantation save \$7000 to \$8000 per year, as compared to the dialysis conducted at health care center. However, the cost increases if legislative changes fail in shifting of hemodialysis being conducted at health care center. The economic burden of ESRD is substantially increased among the diabetic patients (Roberts et al., 1980).

### **3. Discussion**

The patients, suffering from ESRD undergoing dialysis, have to face much stress and need to make adjustments in their lives to improve their health. Therefore, there is a need of renal rehabilitation programs in the dialysis unit including pre dialysis education, in-center training, and community rehabilitation. The economically cheaper nursing

interventions including, pre dialysis education, relevant exercise, follow up, and reassurance can reduce the economic burden, caused due to the disease condition. There is a need to train the nurses, so that they are able to overcome the discomfort and help the patients to lead a normal life because they work around the clock with patients. The escalating healthcare costs, associated with this fatal disease, can be controlled through coordinated and multidisciplinary care approach (Felice, 2010).

A study conducted by Skelton et al. (2015) revealed that patients with kidney transplant tend to live a normal healthy life than the patients treated with dialysis. On the basis of well-being, life satisfaction, and psychological affects, kidney transplant patients led a better quality of life as compared to patients on dialysis. However, the patients undergoing dialysis live a satisfactory life at home (Skelton et al., 2015). ESRD do not provide sufficient condition for surrogate end point in clinical trials, which is amongst the strong and consistent risks associated with it. CKD and its complications can be prevented through proper awareness and use of accurate methods for timely diagnosis; although, it involves most of the organ systems. Low awareness regarding ESRD among the health-care providers was revealed by Jha et al. (2013). However, increased awareness among the patients did not guarantee better quality life and improved outcomes. It has been observed that risk of progression to ESRD and mortality rate were increased among the patients who were aware about their health status.

The rehabilitation of dialysis patients has been regarded as ultimate goal of nursing care. Making the patient realize their optimum level of functioning help the patients to maintain their wellness. Better quality of life, reduced health care costs, and decreased demand of support from care providers are some of the benefits associated with successful rehabilitation of these patients. The success of rehabilitation programs depend on the efforts of health care professionals including the physicians, nurses, physicians, dieticians, social service providers, and pharmacists (Crampton et al., 1998).

Fatigue and frailty among the patients limit the opportunities for the patients to rehabilitate. However, there are many therapeutic advances that have changes the entire outlook of rehabilitation. These changes include; improvements in dialysis equipment, opportunities for home rehabilitation programs, and quality of care for dialysis patients. The increase ability of ESRD patient to control anemia is the most significant factor contributing to increased opportunities for rehabilitation. Anemia tends to represent a great variety of symptoms such as; fatigue, anorexia, hypothermia, decreased libido, lack of energy, depression, and decreased tolerance towards exercise. Improvement has been observed after partial treatment of anemia with Epoetin alfa, which is essential to rehabilitate efforts like the muscle strength exercise (Crampton et al., 1998).

There is significant impact of long-term outcomes on the patients undergoing dialysis. Moreover, there is significant impact of professionals performing dialysis on the patients to help them in dealing with the challenges caused by kidney failure and its treatments. The healthcare professionals encourage and enable patients to accept responsibility of their well-being. It helps them in fulfilling their obligations within the family and society. A positive attitude is conveyed by the prospects of renal rehabilitation for the patients to live well on dialysis. These patients tend to live an active life as a result of staff encouragement to attain the rehabilitation goals. Valuable information on a wide range of topics is provided by the staff provide that helps in controlling factors like adherence, exercise, and self-care. Flexible dialysis schedules, opportunities for patient-to-patient communication, referral to vocational rehabilitation, work-related goal-setting, and meaningful staff interaction help in making adequate adjustments (Staton et al., 2001).

Decrease in GFR is significantly related to doubling of serum creatinine concentration; moreover, it has positive association with increased risk of developing ESRD, leading to mortality. Moreover, the progression of CKD is directly proportional to decrease in GFR by 30% (Coresh et al., 2017). The subsequent decrease in GFR is associated with high incidence of ESRD. The functioning and well-being of ESRD patients together with survival and other clinical outcomes are termed as important indicators for receiving effective medical care. The well-being of ESRD patients is indicated through their lifestyle and perspective about their own life (Tjaden et al., 2016). The severity of disease and effects of treatment intervention are sensitive towards the outcome of disease and its treatment. This helps in providing data about clinically meaningful changes, which indicate the significance of those changes in daily lives of the patients. Therefore, relevant rehabilitation protocols are needed for the patients suffering ESRD.

The progression of CKD is positively associated with long, repeated, and severe episodes of acute kidney injury. There is increase in the number of centers that facilitate dialysis and kidney transplantation in the eastern European countries (Jha et al., 2013). However, the risk of developing kidney disease is increased by 60% among the patients from lower socio-economic status, as compared to patients from high economic status (Merkin et al., 2007).

#### 4. Conclusion

Nurse education enables the nurses to gain skills, required for practicing the psychosocial principles in setup; where high technological interventions are carried out. Overall adjustment and decision making for the patients on dialysis can be aided through early education about renal disease, its treatments, and the potential to live long. The patients undergoing dialysis can maintain a sense of life satisfaction by learning about topics including kidney failure, treatment choices, medications, and the renal diet (Uttley & Prowant, 1994). Receiving adequate education regarded kidney disease and its management have been rendered as positive predictor of physical and mental health of patients on hemodialysis. The symptoms of kidney disease were efficiently managed by the patients who were informed about the disease. Moreover, there is a positive impact of encouragement from family members and dialysis staff on the health of the patients during treatment.

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