



Global Advanced Research Journal of Medicine and Medical Sciences (ISSN: 2315-5159) Vol. 5(7) pp. 199-202, July, 2016  
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## *Full Length Research Paper*

# **Economic Burden of Hemodialysis**

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Accepted 04 July, 2016

**The numbers of patients requiring renal replacement therapy are known to be increasing in most countries. The cost of renal replacement therapy in is a very important issue. The overall prevalence of chronic kidney disease in Saudi Arabia is 5.7%. We found a total of 28 patients on hemodialysis and this contributes to 53.84% of our bed's occupancy in the medical wards in our hospital. Cost per session was 133\$ and the annual cost per patient was 20,800\$. Given the huge magnitude of the problems, solutions such as peritoneal dialysis, transplant and home hemodialysis should be implemented.**

**Keywords:** Renal replacement therapy, chronic kidney disease, end stage renal disease, cost effectiveness, economic burden

## **List of Abbreviation**

CKD, chronic kidney disease; RRT, renal replacement therapy; KDOQI, Kidney Disease Outcomes Quality Initiative; CAPD, continuous ambulatory peritoneal dialysis; PD, peritoneal dialysis; HD, hemodialysis; ESRD, End stage renal disease; HHD, Home hemodialysis

## **INTRODUCTION**

Chronic kidney disease is defined as a decreased glomerular filtration rate less than 15% of renal function. The diagnosis is established by the criteria of the clinical guidelines from the National Kidney Foundation as referenced in the KDOQI (Kidney Disease Outcomes Quality Initiative). Replacement therapy treatment for terminal kidney disease includes five modes, including

intermittent peritoneal dialysis (IPD), cyclic or ambulatory peritoneal dialysis (APD), continuous ambulatory peritoneal dialysis (CAPD), hemodialysis (HD) and kidney transplantation (Ríos et al., 2014). The numbers of patients requiring renal replacement therapy (RRT) are known to be increasing in most countries. The cost of RRT in is a very important issue (Abreu et al., 2011). The overall prevalence of CKD in Saudi Arabia is 5.7%. CKD is significantly higher in the older age groups, higher serum glucose, waist/hip ratio and blood pressure (Alsuwaida et al., 2010). In the Kingdom of Saudi Arabia, the mean prevalence is 540 per million population. Of these, 92.8% are on HD (Bayoumi et al., 2013).

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## METHODS

A cross sectional study was conducted at an academic center in Saudi Arabia during the month of April 2015. This was conducted to analyze the economic burden of HD inpatients in our hospital and to find possible solutions.

## RESULTS

A total of 28 patients on HD (13 females and 15 males) and this contributes to 53.84% of our bed's occupancy in the medical wards. Cost per session was 133\$ and the annual cost per patient was 20,800\$.

## DISCUSSION

Each year a large number of older individuals with advanced renal disease are started on chronic dialysis therapy. Life expectancy is estimated at between 2 and 4 years depending on age, comorbidity, and intensity of medical care required in the weeks around the dialysis start time (Malavade et al., 2013).

How to deal with elderly patients and patients with other comorbidities and whether stopping dialysis is an ethical decision. This is a critical issue. Perhaps the most difficult clinical decision faced by nephrologists today is whether their elderly patient (arbitrarily defined as age >70 years) with advanced CKD is likely to benefit from dialysis. Unfortunately, survival of elderly dialysis patients is generally worse than that for most cancers. Elderly patients who choose not to have dialysis as part of shared decision making survive a median of 16 months. Utilizing the skills of palliative medicine helps provide reasonable symptom control without dialysis (Brown et al., 2015). A marked decline in clinical status warrants review of the balance of benefits to burdens dialysis is providing to a given patient and should trigger a conversation about the option of withdrawal using an individualized patient-centered, rather than disease-oriented, approach. Patients who wish to withdraw because of unsatisfactory quality of life and those (many with significant cognitive impairment) for whom withdrawal is deemed appropriate because the burdens of continuing treatment substantially outweigh the benefits. This is emotionally debilitating for patients and families in addition to being medically and ethically challenging for treating nephrologists. Potential triggers to identify patients for whom withdrawal should be considered: Poor prognosis based on patient-specific estimate of prognosis, accelerating comorbid illnesses, increased frequency of hospitalizations, failure to thrive,

diagnosis of non renal terminal illnesses, loss of function, including admission to a nursing home and loss of personal drive to continue or severe, unrelenting depression (Schmidt et al., 2014).

All of the new dialysis patients present to our hospital were without dialysis access which aggravates the magnitude of our problem. Late referral to a nephrologist in patients with chronic renal failure influences the adequacy of vascular access for HD. Patients referred late are more likely to require central venous access for HD compared to those seen by a nephrologist earlier. Inadequate development of vascular access for RRT in patients with late nephrologist referral unnecessarily contributes to the burden of disease experienced by this vulnerable patient population (Avorn et al., 2002). End-stage renal disease (ESRD) patients who choose HD require a vascular access, and those who choose peritoneal dialysis (PD) require a peritoneal catheter before initiation of renal RRT. The type of vascular access used in HD patients is recognized to have a significant influence on patient survival. Compared with use of a native arteriovenous fistula (AVF), use of a tunneled cuffed catheter (TCC) is associated with a substantially greater risk of sepsis, hospitalization, and mortality. By contrast, PD catheter complications have declined in recent years, with low rates of bacteremia and sepsis (Coentrão et al., 2013).

The cost is not limited to the access creation or to the direct HD course, the indirect cost is a major problem for the patients and their care givers although is not addressed in our research. Chronic disabling conditions disrupt the lifestyles of the affected individuals and their families by interfering with their activities and interests, thus compromising quality of life. In patients with ESRD, illness intrusion affects important life domains such as work and finances, family and personal relationships, recreation as well as health related domains. (Bapat et al., 2009). Patients receiving HD often perceive their caregivers are overburdened (Suri et al., 2014).

The current standard of care for ESRD is based on disease-specific guidelines that address aspects of ESRD due directly to renal failure (e.g., dialysis, anemia, and renal osteodystrophy) but patients identified lack of energy, sleep disturbance, trouble concentrating, depressed mood, dizziness/imbalance, problems walking, weakness, and dependence on others among their primary problems (Leinau et al., 2009). Depression is recognized as the most common psychiatric problem in patients with ESRD (Saeed et al., 2012). The daily pill burden in dialysis patients is high. A higher pill burden is a predictor of lower scores on the health related quality of life, high potential for drug interactions and lower adherence to therapy (Chiu et al., 2009).

The rate of unemployment in working-age patients with CKD and ESRD is high compared with that of the general population. Treating anemia with erythropoietin before kidney failure and educating patients about work-friendly home dialysis (HHD) options might improve job retention (Muehrer et al., 2011). Patients who are ill before puberty became progressively more disadvantaged in terms of successful transition into full-time employment, compared with those first diagnosed after puberty (Lewis et al., 2015).

Late referral to a nephrologist is associated with poor quality of life symptoms, problems and effects of disease dimensions. Therefore, CKD disease management incorporating psychological support should be emphasized (Boini et al., 2011). Social support might reduce illness burden and improve patients' perceived health. Structured support programs for dialysis patients might be a valuable intervention (Neri et al., 2011).

As we have very limited slots for HD in our hospital and to cope with the increasing demands to expand dialysis capacity, it is essential to develop treatment modalities for those patients who do not necessarily need hospital HD and to focus on self-care dialysis modalities such as PD, HHD.

At the time of our study, none of our patients was on PD. Although we have that service but most of our patients are either not candidate for PD or refusing as they can't take the responsibility of self treatment. To make more cost-effective use of resources, a sequential dialysis care with PD first and then HD as required for incident ESRD patients is warranted. The total lifetime cost and the cost per life-year are lower for PD patients than for HD patients (Kao et al., 2013).

Unfortunately, we don't have yet a transplant facility in our hospital but given the magnitude of our problem, we need to initiate or refer to a transplant facility. Kidney transplantation is the only viable renal replacement option for most of the patients. The cost-effectiveness of kidney transplantation over dialysis is well-documented (Ramachandra et al., 2013). Patients on dialysis have a reduced quality of life compared with transplant patients who are similar to that of the general population (Bayoumi et al., 2013).

HHD can enable a superior quality of life for many people living on dialysis (Polaschek et al., 2005). In the HHD setting, patients had on average more and longer dialysis sessions (Malmström et al., 2008). However, there are few patient-perceived barriers such as; fears of self-cannulation, a catastrophic event, and the burden on the family (Cafazzo et al., 2009).

In conclusion, costs of treating and managing patients on hemodialysis in Saudi Arabia are substantial. Therefore, efforts should be taken to slow down the progress of renal failure to save resources and a comparative study with other modalities, such as peritoneal dialysis and kidney transplantation, should be considered.

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