

REVIEW ARTICLE

CHRONIC KIDNEY DISEASE AND HEMODIALYSIS: EPIDEMIOLOGICAL CHARACTERISTICS AND PSYCHOLOGICAL DISORDERS

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Abstract

Chronic Kidney Disease (CKD) is a progressive decline in kidney function which is usually asymptomatic until the development of End Stage Renal Disease (ESRD). Haemodialysis is the most common treatment method for ESRD. However, patients on hemodialysis have a variety of psychological disorders due to complications and restrictions of the treatment. **Aim:** of the present study was to review the literature about epidemiological characteristics and psychological disorders in Chronic Kidney Disease and hemodialysis treatment. **Material and Method:** Literature review was based on research studies and reviews conducted during the last decade, derived from international (Medline, PubMed, Cinahl) databases concerning epidemiological characteristics and psychological disorders in Chronic Kidney Disease and hemodialysis treatment. **Results:** The global prevalence of CKD ranges from 11 to 13%, due to increase in hypertension and diabetes, as well as the ageing population. It is estimated that more than 75% of patients with ESRD are undergoing haemodialysis. However, patients frequently have sleep disorders, poor appetite, fatigue, infertility, sexual dysfunction, problems with bones, anaemia, cardiovascular and gastrointestinal disorders, anger, discouragement, dissatisfaction and disappointment, which lead to difficulties in their compliance with the treatment. **Conclusion:** There is a need for effective management of psychological disturbances in these patients in order to maintain their health status.

Keywords: Chronic Kidney Disease, hemodialysis, End Stage Renal Disease, psychological disorders, epidemiology

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Introduction

Chronic Kidney Disease (CKD) is a progressive decline in kidney function, mostly caused by diabetes and hypertension¹. It is usually asymptomatic and is often diagnosed at advanced stages, when dialysis is essential for patients' life². It has been found that fewer than 10% of people with CKD recognized their disease¹.

In CKD, kidney failure is treated for a considerable period of time with proper diet, limitation of sodium intake, phosphate control and medication. However, after months or years there has been a progressive and irreversible decline in renal function. When renal function falls to a level of 10-15% of the normal, it has reached the final stage³.

CKD usually leads to the development of End Stage Renal Disease (ESRD)¹. However, a variety of symptoms appear after the decrease in kidney function, which mostly affect gastrointestinal, cardiovascular, pulmonary and nervous system⁴. All systems are affected and a wide range of clinical symptoms appear, known as uremic syndrome³.

Haemodialysis has been proved to be the most common treatment method worldwide for ESRD⁵. Millions of patients with ESRD have been saved by this treatment modality since 1960⁶. Hemodialysis removes the waste products of protein metabolism, toxins and excess water from blood circulation, maintaining the appropriate level of electrolytes and acid-based⁷.

A dialysis machine is required to perform hemodialysis, as well as a hemodialysis filter, a hemodialysis solution, an arteriovenous anastomosis, and needles with a large lumen. Additionally patients have to visit

dialysis centre 2-3 times a week, with each dialysis session lasting for 4-6 hours⁸. Additionally, patients undergoing hemodialysis receive a large number of medications on a daily basis⁹ and follow dietary modifications in order to maintain their nutritional status¹⁰.

Epidemiology of Chronic Kidney Disease and hemodialysis treatment

It has been found that Chronic Kidney Disease (CKD) has high prevalence in developed areas such as Europe, USA, Canada, Australia compared to areas with growing economies such as sub Saharan Africa and India. The global prevalence of CKD is high, ranging from 11 to 13%, due to increase in hypertension and diabetes, as well as the ageing population^{11, 12}. It is estimated that 242 million people have CKD all over the world¹³, with an increase of 8% annually¹⁴. Patients with CKD have an 83% high rate of all- cause mortality and are twice as likely to die from cardiovascular disease¹⁵.

It is estimated that 1.9 million patients are receiving renal replacement therapies all over the world¹⁶, of whom about 1 million are undergoing haemodialysis¹⁷. Over 75% of patients with ESRD are undergoing haemodialysis¹⁸, while over \$1 trillion is spent on the care of dialysis patients¹⁹. The mean age of people who usually start dialysis is about 75 years or more. These patients have multiple co morbid diseases, disabilities and geriatric conditions, such as multiple drug therapy, decline in cognitive function and reduced social life²⁰.

In the USA about 428,000 people were undergoing haemodialysis in 2014, with 53% of them being 22-64 years old²¹. It is estimated that in the USA 100,000

patients begin dialysis annually (355 per million population), while in Japan dialysis therapy has the highest prevalence (2,000 people per million population), since life expectancy helps old people with CKD reach ESRD and increase their survival while on dialysis. In European countries about 400-700 people per million population are undergoing dialysis therapy¹.

In economically developed countries there has been a rapid increase of dialysis patients the last few years. For example, in Thailand 220 people per million population were on dialysis treatment in 2005, while this number was doubled to 553 people per million population in 2009¹.

Psychological disorders and hemodialysis

The chronic and long-term dialysis cause changes in patients' life, thus frequently leading to loss of meaning in their life and increase in their psychological disorders²². Hemodialysis includes feelings of hopelessness and sense of lack of control²³, as well as anger, discouragement, dissatisfaction, and disappointment due to complications and restrictions of the treatment²².

A variety of acute and chronic complications accompany this treatment²⁴ due to the inability of dialysis therapy to clear all the uremic toxins from patients body⁶. The most common acute complications during hemodialysis regimen are hypotension, air embolism, clotting of blood, haemolysis²⁵, hypertension after the beginning of haemodialysis, nausea, vomiting, body pain, muscle cramps, headaches, electrolyte disorders, convulsions, bleeding or thrombosis of arteriovenous anastomosis and itching⁶.

Moreover, patients frequently have sleep disorders, poor appetite⁶, fatigue, infertility, sexual dysfunction, problems with bones, anaemia, cardiovascular and gastrointestinal disorders²⁶. Additionally, uremic peripheral neuropathy is a common complication among patients on haemodialysis for more than 1 or 2 years, causing restless leg, cramps, muscular weakness, sensory disturbances, pain, numbness, dizziness, hypotension, erectile and gastrointestinal dysfunction²⁷.

Hemodialysis patients are usually of advanced age²⁸, are at a high risk of physical, cognitive and emotional problems²⁹, mainly due to diabetes mellitus, hypertension, cardiovascular, pulmonary and skeletal diseases²⁸. Cook et al.,³⁰ found high rates of disability and low physical performance among old patients, being unable to live independently.

Depression is the most frequent psychological disorder in haemodialysis population, which leads to low compliance with treatment regimen³¹. It is mostly associated with co-morbid diseases, such as cardiovascular disease and diabetes, while it includes high suicide risk and frequent hospital admissions. Depressive disturbances in dialysis population have a close relation with malnutrition, chronic inflammation, cognitive impairment, chronic pain, low quality of sleep, sexual dysfunction and unemployment among these people³²⁻³⁴.

Last but not least, dependency on hemodialysis machine is an issue that may trigger psychological disturbances and merits further research. It is widely known that patients lead a technologically sustained life involving painful procedures. Interestingly, the loss of independence along with the heavy personal, family, financial and emotional burden constitute an impede

for a retaining normal life. A recent study in Greek population showed that among 250 hemodialysis patients, the 44% reported to experience dependency on hemodialysis machine. More dependency on machine was experienced by patients who had below moderate relations with nursing staff (58.8%), those who had not noticed any change in their body (51.2%), those who did not face any difficulties in their social and family environment (69.0% and 49.4%, respectively), those who did not hide their problem or did not need help in daily activities reported (48.7% and 57.6%, respectively) and finally patients who believed that their lifestyle had changed very much (59.3%)³⁵.

However, there is a need for effective management of psychological disturbances in these patients in order to maintain their quality of life. Among 395 hemodialysis Greek patients, 47.8% experienced high levels of anxiety and 38.2% high levels of depression. It was also shown that quality of life was 2.5 and 4.4 points lower for patients with moderate and high levels of depression, respectively, compared to patients with low levels. Therefore, health professionals should not underestimate symptoms from mental dimension which frequently overlap with clinical symptomology of CKD. For instance, components of depression such as anorexia, fatigue, sexual and sleep disturbances share common characteristics with uremic state. A possible explanation of the association between high levels of depression and poor quality of life is attributed to non adherence to the therapeutic regimen. However, treatment with antidepressants improves both quality of life and depression³⁶.

Pharmacological treatment, cognitive-behavioural therapy, exercise programmes and relaxation

methods have a positive impact on their physical and psychological well-being³⁷. Nowadays, there is a growing interest in providing social support since it may affect positively the disease outcome through various paths such as improving patients' coping mechanisms, minimizing stress, offering help to practical issues or access to health services and enhancing treatment adherence including diet and fluid limitations. Social support is usually provided by family, friends, co-workers, spiritual advisors, health professionals, and members of one's community. Important elements of support are quantity of the supportive network, the frequency of supportive interaction and type of supportive interventions. Though, family responsibilities are modified according to dialysis routine, the psychosocial well-being of hemodialysis patients depends on family unit or cohesion³⁸.

Additionally more, provision of accurate and elaborate information by multidisciplinary health care teams may alleviate psychological disturbances, thus having important clinical implications. Expanding patients' knowledge about disease management will facilitate long-term treatment success through enhancing self-efficacy. Interestingly, among 650 hemodialysis patients (360 men and 290 women) those who reported to adhere very much with treatment guidelines have 15.52 more chances to be very informed than patients who reported to adhere not at all³⁹.

All the findings presented, underscore the importance of identifying the best approach to treating this frequently-encountered co morbidity. It is that suggested that understanding emotional disturbance is fundamental to the development of appropriate interventions that address patients' needs, thus leading to

early diagnosis and treatment of physical and psychological disorders⁴⁰.

Conclusions

Haemodialysis is the most common treatment method worldwide for End Stage Renal Disease. However, patients frequently have sleep disorders, poor appetite,

fatigue, infertility, sexual dysfunction, problems with bones, anaemia, cardiovascular and gastrointestinal disorders, anger, discouragement, dissatisfaction and disappointment. Thus, there is a need for effective management of physical and psychological disturbances in dialysis patients in order to maintain their health status.

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