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EXPLORING THE IMPACT OF ANAEMIA, QUALITY OF LIFE AND SLEEP DISTRUBENCES IN NON-HEMODIALYSIS AND HEMODIALYSISPATIENTS DOCTOR OF PHARMACY

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ABSTRACT

Introduction: Chronic kidney disease (CKD), also known as chronic renal insufficiency or progressive kidney disease could be a condition within which kidney function gradually deteriorates over time. Kidney function impairment, defined as a glomerular filtration rate (GFR) of less than 60 ml/min/1.73m2 on a minimum of two times over three months. Anemia, a decrease in the hemoglobin (Hb) carried within red blood cells, is a common complication of CKD and is associated with debilitating symptoms, including fatigue, weakness, shortness of breath, dizziness, headaches and depression. Anemia has been defined as Hb < 12 g/dL in women and < 13 g/dL in men. Sleep is a biological necessity for maintaining mental and physical well-being. It is a state of diminished physical activity and limited consciousness in which the organism slows down and restores itself. Health-related quality of life (HRQOL) is known to be reduced in patients with CKD, and the presence of anemia appears to be associated with exacerbation of HRQOL impairment. **Methodology:** It is a prospective and cross-sectional study conducted in In-patient and Outpatient department for 6months. Among 105 subjects who met inclusion criteria were evaluated and monitored. Statistical procedure of Pearson's correlation coefficient, Anova, Chi square test and t-test was done in Excel sheet. **Results:** In the data of anemia greater number of patients was found at the age of 51-60 (43.8%). The median age of the patients found to be 55.5 years. In those patients about 66.66% are on iron supplementation. Comorbidities like hypertension (69.5%), diabetes (41.90%). Of all the patients male patients were greater (75.23%) compared to that of females (24.7%). In the data of sleep, 68 patients were taken as poor sleepers (64.76%) and 37 patients were taken as good sleepers (35.23%) which includes both HD and Non-HD patients. Gender wise calculated and found sleep disturbances in males72.38% and females 27.61%. Greater number of patients was found in 50-59 (30.47%). In quality of life, there a negative impact found between progression of CKD and HRQOL. **Conclusion:** In the conclusion**,** Anemia is the first known systemically reviewed complication in the progression of the disease. Appropriate treatment that not only manages anemia but also reduces the negative outcomes, that may reduce burden of anemia. Many sleep disturbances are seen but at present no treatment is specified, as of now. Sleep disturbances are referred as to one of the most important distressing symptoms which affect QOL and the mortality risk. In early stages, QOL decreases but latter it shows negative impact with progression of disease.

KEYWORDS: Anemia, Quality of life, Sleep disturbances, Non-Hemodialysis, Hemodialysis.

1. INTRODUCTION

The kidneys are the renal system's most important critical functioning organs. The functional unit of the kidneys is that the nephron, which is that the system that makes urine when waste and excess substances are removed from the circulation. Each human kidney contains approximately 100,000 nephrons.

They are required for homeostatic processes like electrolyte management, acid-base balance maintenance, and blood pressure regulation (by upholding salt and water balance). They act as a natural blood filter for the body, removing wastes that are excreted through the urine. Furthermore, the kidneys produce hormones like calcitriol, erythropoietin, and the renin enzyme, all of which are important within the body.

Chronic kidney disease (CKD), also known as chronic renal insufficiency or progressive kidney disease could be a condition within which kidney function gradually deteriorates over time. The "kidney disease outcomes quality initiative" (KDOQI) of the United States National Kidney Foundation defines CKD as either:

- Continuous proteinuria, hematuria, or anatomical

abnormalities cause kidney disease (e.g., cysts).
- Kidney function impairment, defined as a glomerular filtration rate (GFR) of less than 60 ml/min/1.73m2 on a minimum of two times over three months.

CKD is an increasing health concern; in Europe and the United States, the proportion of individuals experiencing end-stage renal disease (ESRD) has quite doubled within the last two decades.

1.1 Stages of chronic kidney disease

To facilitate assessment of CKD severity and, the National Kidney Foundation developed criteria, as part of its Kidney Disease Outcomes Quality Initiative (NKF KDOQI™), stratify CKD patients (Coresh J, 2003).[1]

Stage1: normal eGFR 90 mL/min per 1.73 m^2 with persistent albuminuria.
Stage2: eGFR in between 60 to 89 mL/min per 1.73 m^2.
Stage3: eGFR in between 30 to 59 mL/min per 1.73 m^2.
Stage4: eGFR in between 15 to 29 mL/min per 1.73 m^2.
Stage5: eGFR 15 mL/min per 1.73 m^2 or end-stage renal disease (ESRD).

How to classify CKD[2]

- Identify cause of CKD (C)
- Assign GFR category (G)
- Assign albuminuria category (A)

Collectively referred to as "CGA Staging"

a) Identify Cause of CKD

- The presence or absence of systemic disease, as well as the location within the kidney of observable or alleged pathologic-anatomic judgments on kidney biopsy or imaging, are used to classify the cause of CKD.
- Determining the origin of CKD is important because it determines whether the patient has a systemic condition or a localized condition in the kidney, such as glomerular disease, which impacts care.
- It is expected that the cause of disease for many CKD patients will not be identified with confidence, but will be inferred or unknown.

Table 1.

	Examples of systemic diseases affecting the kidney	**Examples of primary kidney diseases (absence of systemic diseases affecting the kidney)**
Glomerular diseases	Diabetes, systemic autoimmune diseases, systemic infections, drugs, neoplasia (including amyloidosis)	Diffuse, focal or crescentic proliferative glomerulonephritis; focal and segmental glomerulosclerosis; Membranous nephropathy, minimal change disease
Tubulointerstitial diseases	Systemic infections, autoimmune, sarcoidoisis, drugs, urate, environmental toxins (lead, aristolochic acid), neoplasia (myeloma)	Urinary-tract infections, stones, obstruction
Vascular diseases	Atherosclerosis, hypertension, ischemia, cholesterol emboli, systemic vasculitis, thrombotic microangiopathy, systemic sclerosis	ANCA-associated renal limited vasculitis; fibromuscular dysplasia
Cystic and congenital diseases	Polycystic kidney disease, Alport's syndrome, Fabry's disease	Renal dysplasia, medullary cystic disease, Podocytopathies

b) Assign GFR categories as follows

Table 2.

GFRcategoriesinCKD		
Category	**GFR ml/min/1.73m^2**	**Terms**
G1	>90	Normal or high
G2	60-89	Mildly decreased*
G3a	45-59	Mildly to moderately decreased
G3b	30-44	Moderately to severely decreased
G4	15-29	Severely decreased
G5	<15	Kidney failure

*Relative to young adult level

In the absence of evidence of kidney damage, neither GFR category G1 nor G2 fulfill the criteria for CKD.

c) Assign Albuminuria category as follows

Table 3.

Category	ACRmg/g	Terms
A1	<30	Normal to mildly increased
A2	30-300	Moderately increased*
A3	>300	Severely increased**

ACR, albumin to creatinine ratio
*Relative to young adult levels
**Including nephrotic syndrome (albumin excretion ACR >2220mg/g)

1.1.1. RISKFACTORS

A. CKD Initiation Factors: Initiation factors are conditions that cause renal disease and can be treated with pharmacologic therapy.

1. Diabetes mellitus is a kind of diabetes that affects people of all ages.
2. High blood pressure,
3. Autoimmune disorders are a type of sickness in which the body's immune system attacks
4. Polycystic kidney disease, often known as polycystic kidney disease or polycystic
5. Infections that affect the entire body
6. Urinary tract infections, stones, and blockages of the lower urinary tract
7. Toxicology of drugs

B. Susceptibility factors for CKD

Advanced age, low income or education, and racial/ethnic minority status, as well as lower kidney mass, low birth weight, and a family history of CKD, is all risk factors for CKD.

Systemic inflammation and dyslipidemia are two new susceptibility variables that have been proposed.

Although these factors have not been demonstrated to cause kidney damage directly, they can aid in the identification of patients who are at risk of developing CKD.

C. Progression factors for CKD

Kidney injury is exacerbated by progression factors. The persistence of underlying beginning factors (e.g., diabetes mellitus, hypertension, glomerulonephritis, and polycystic kidney disease) as well as the progression factors of proteinuria, increased blood pressure, and smoking are the most important predictors of progressive CKD

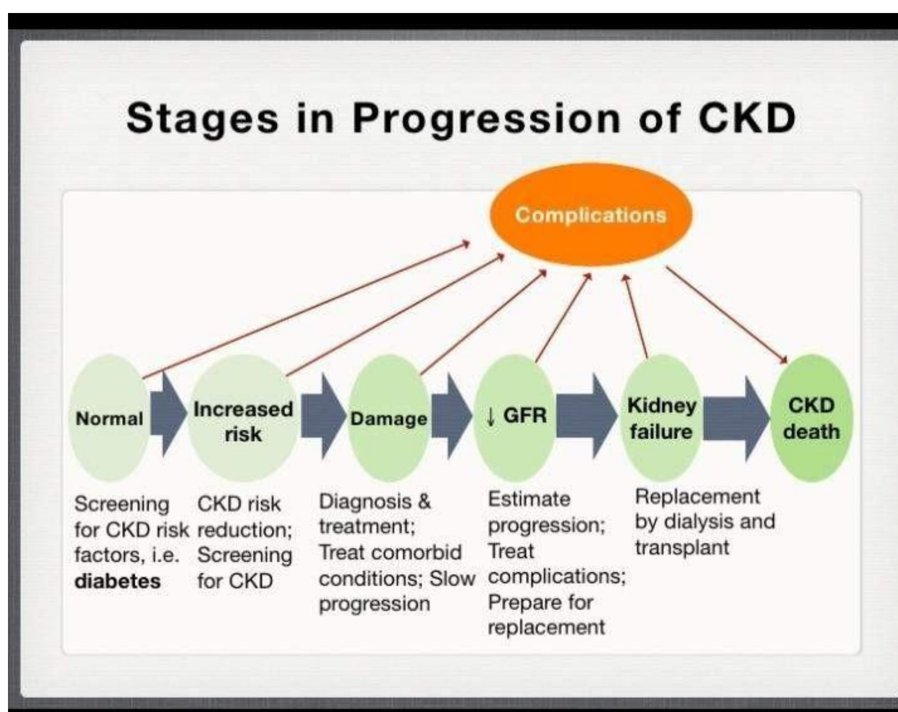


Figure 1: Progression of Chronic Kidney Disease.

1.1.2. Prevalence of chronic kidney disease

India carrying for about 1.2 billion populations and in this recent years it has registered impressive economic growth; however approximately 70% of the population are still lives hardly on the less than 60 rupees per day.

Reddy et al they pointed out in a review that in year 2005 at least 53% of the deaths in India were attributed to chronic diseases.[3]

By this it's well recognized that the prevalence of CKD is increasing all over the world day by day and the global annual growth number of the ESRD patients is reported at 7%.[4]

Unfortunately, from India there is no longitudinal study and limited data on the prevalence of CKD. In western countries, hypertension, and diabetes accounts for over 2/3rd of the cases of CKD. In India, the same etiologies

i.e. Hypertension and diabetes accounts for about 40-60% cases of CKD.[5]

Few studies in India states that males are more prone to CKD than that of females. The ratio of male and female prone to CKD is 70:30 respectively for every hundred CKD patients.[6]

The study conducted among central government in India, In order to detect early stages of CKD by using MDRD (Modification of diet in Renal Diseases) and chronic kidney disease epidemiology collaborates (CKD-EPI) equation for GFR, Serum Creatinine, lipid profile and fasting blood glucose. Out of 3398 populations they found that 13.12% were having early stages of CKD, i.e., 6.62%, 5.54%, 3.02% of stage 1, stage 2 and stage 3 respectively.[7]

In western countries Hypertension and diabetes are the major risk factors for CKD.[8]

1.2 DIALYSIS

The process of removal of waste and further water from blood is named dialysis.[9] It's a man- made replacement of kidney functioning, especially in kidney failure cases. Dialysis cannot completely perform lost kidney function, but, to some extent, manages its activities by means of diffusion and ultrafiltration.[10] It's wiped out chronic nephrosis (CRF) when the glomerular filtration rate falls below 15 ml/min/1.73m2.[11] CRF could be a condition where there's a loss of kidney function over a period of months or years. CRF is diagnosed by measuring serum creatinine levels, which are a degradative product of muscle protein. Creatinine levels indicate the glomerular filtration rate (GFR) and in CRF, its activities are raised, indicating a lowered GFR.[12] There are five stages of CRF supported the GFR, and dialysis is preferred in stage 5 (GFR < 15 ml/min/1.73m^2); this stage is additionally called end stage renal disease (ESRD).[13]

Dialysis is executed in CRF patients to export accumulated toxins from the body. This procedure may be responsible for the development of oxidative stress, due to an imbalance between the overproduction of reactive oxygen species or toxins and a reduced defense mechanism of the body.

The renal functional capacity can be evaluated by computing serum creatinine/blood urea nitrogen (BUN) or by urea and creatinine clearance. There exist two types of dialysis techniques; it may be hemodialysis (using a machine/artificial kidney-like apparatus) or peritoneal dialysis (using a peritoneal membrane as a filter). Peritoneal dialysis is endorsed for younger patients because of its flexibility and can be executed at home. Hemodialysis is performed for patients with no residual renal function.

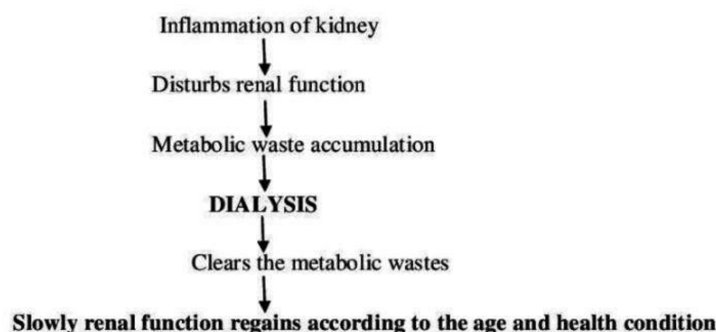


Figure 2: The Stages and Role of Dialysis.

1.2.1 Hemodialysis

In hemodialysis, the wastes and excess water are removed by using an external filter called a dialyzer, which encloses a tissue layer. The separation of wastes is finished by creating a counter-current flow gradient, where blood flow is in one direction and also the fluid of the dialyzer is within the opposite direction. Peritoneal dialysis uses the peritoneum as a natural membrane and removes waste and water into the dialysate (the material or fluid that passes through the membrane of the dialysis).

The basic principle involved in dialysis is that the movement or diffusion of solute particles across a membrane (diffusion). Metabolic waste products, like urea and creatinine, diffuse down the concentration gradient from the circulation into the dialysate (sodium bicarbonate ($NaHCO_3$), binary compound (NaCl), acid concentrate, and deionized water). During their diffusion into the dialysate, the dimension of particles, in turn, regulates the speed of diffusion across the membrane. The higher the dimension of the solute particle, the slower is that the rate of diffusion across the membrane. Here, arteries carrying oxygenated blood from the heart are connected to a vein forming an arteriovenous shunt, which makes the vein strong (by forming muscles around it like an artery) enough to be punctured many times; its pressure is additionally during the method of dialysis.

1.3. ANEMIA

Anemia, a decrease in the hemoglobin (Hb) carried within red blood cells, is a common complication of

CKD and is associated with debilitating symptoms, including fatigue, weakness, shortness of breath, dizziness, headaches and depression[14,15] Anemia has been defined as Hb < 12 g/dL in women and < 13 g/dL in men.[16] Anemia in CKD is predominantly caused by a relative deficiency of erythropoietin, a hormone produced in adults primarily by the kidneys[17], although shortened red blood cell half-life and functional iron deficiency also contribute to the anemia of CKD.[18]

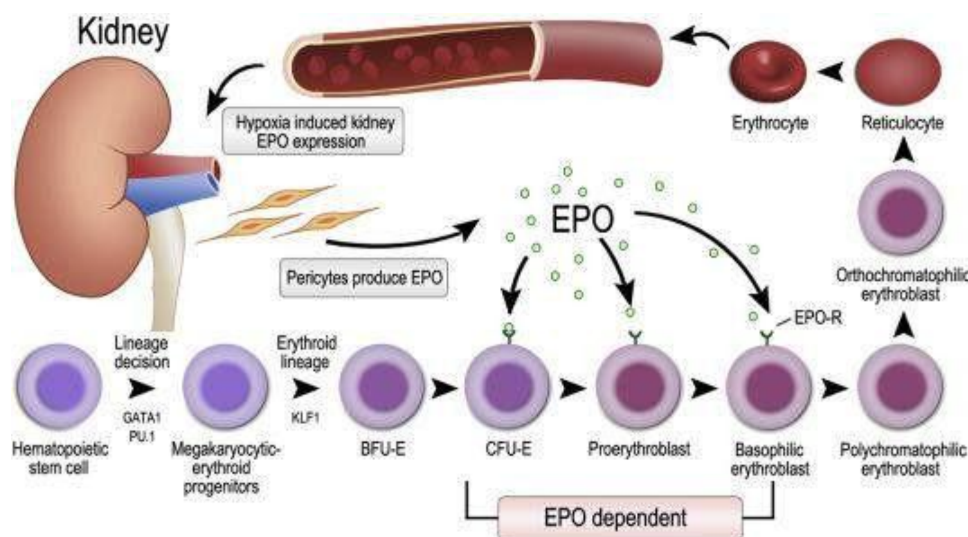


Figure 3: Stages of erythroid differentiation and oxygen dependent feedback loop regulated by kidney EPO.

Erythropoietin (EPO), a glycoprotein hormone, is the major regulator of erythropoiesis. In CKD, plasma EPO level is out of proportion to the degree of anemia.[19]

1.3.1. What causes anemia in CKD

Anemia in people with CKD often has more than one cause.

When your kidneys are damaged, they produce less erythropoietin (EPO), a hormone that signals your bone marrow—the spongy tissue inside most of your bones—to make red blood cells. With less EPO, your body makes fewer red blood cells, and less oxygen is delivered to your organs and tissues.

In addition to your body making fewer red blood cells, the red blood cells of people with anemia and CKD tend to live in the bloodstream for a shorter time than normal, causing the blood cells to die faster than they can be replaced.

People with anemia and CKD may have low levels of nutrients, such as iron, vitamin B12, folate, that are needed to make healthy red blood cells.

Other causes of anemia related to CKD include

- Blood loss, particularly if you are treated with dialysis for kidney failure
- Infection
- Inflammation
- Malnutrition, a condition that occurs when the body doesn't get enough nutrients

1.3.2. Epidemiology

Anemia is common in people with CKD, especially among people with more advanced kidney disease. More than 37 million American adults may have CKD,[20] and it is estimated that more than 1 out of every 7 people with kidney disease have anemia.[21]

Most people who have kidney failure—when kidney damage is so advanced that less than 15 percent of the kidney is working normally—also have anemia.[22]

The prevalence of anemia increased with stage of CKD, from 8.4% at stage 1 to 53.4% at stage 5. The prevalence of anemia in people without CKD was 6.3%.

1.3.3. Parameters

Table 4.

Tests	Values
Hb	Male: 13.5-17.5gr/dl Female: 12.0-15.5gr/dl
RBC	4.5- 5.5 10^6/ul
Iron	Male: 59-159ug/dl Female: 37-145ug/dl
Ferritin	Male: 25-250ng/ml Female: 13-232ng/ml
Transferrin	200-360mg/dl
TIBC	255-450ug/dl
Intact PTH	6-80pg/ml

1.4. SLEEP DISORDERS[23]

Sleep is a biological necessity for maintaining mental and physical well-being. It is a state of diminished physical activity and limited consciousness in which the organism slows down and restores itself. Throughout the sleep period, the sleep cycle is divided into two stages that alternate episodically from light sleep to deep,

deeper, and deepest sleep.

There are two primary stages to the process.

- Rapid Eye Movement (REM) sleep, during which dreaming occurs
- Non-Rapid Eye Movement (NREM) or slow-wave sleep (SWS)

1.4.1. Sleep Cycle

Humans typically have four to six cycles of non–rapid eye movement (NREM) and rapid eye movement (REM) sleep each night, each cycle lasting 70 to 120 minutes. Usually there is progression through the four stages of NREM sleep before the first REM period. Stage 1 of NREM is the stage between wakefulness and sleep. Stage 3 and 4 sleep is called delta sleep (i.e., slow-wave sleep). In REM sleep, there is a low-amplitude, mixed-frequency electroencephalogram, increased electric and metabolic activity, increased cerebral blood flow, muscle atonia, poikilothermic, vivid dreaming, and fluctuations in respiratory and cardiac rate.

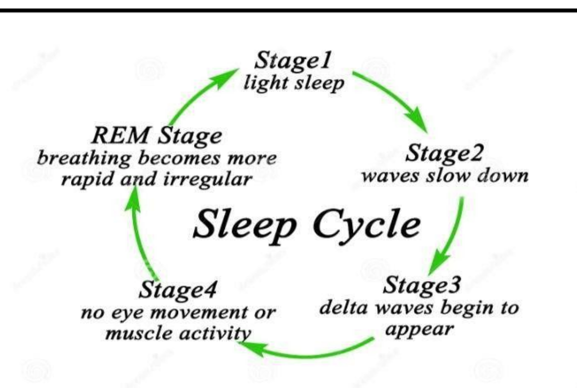


Figure 3: Staging of Sleep Cycle.

In the elderly, sleep is lighter and more fragmented with more arousals and a gradual reduction in slow-wave sleep. Sleep is reduced when there is decreased serotonin activity or destruction of the dorsal raphe nucleus. REM sleep is turned on by cholinergic cells. Dopamine has an alerting effect. Neurochemicals involved in wakefulness include norepinephrine and acetylcholine in the cortex and histamine and neuropeptides (e.g., substance P and corticotrophin-releasing factor) in the hypothalamus.

Polysomnography(PSG) is a procedure that measures multiple electrophysiological parameters simultaneously during sleep (e.g., electroencephalogram, electrooculogram, and electromyogram to characterize sleep and diagnose sleep disorders.

Patients with chronic kidney disease (CKD), particularly those with end-stage renal disease, are more likely to have sleep problems.[24] The reasons for the higher incidences of sleep-related difficulties and disorders in this population are likely multifaceted, as this review shall examine. Sleep problems aren't just linked to a lower quality of life.[25,26] However, they are linked to an increase in health-related risk[27], and mortality[24,[28] in CKD.

1.4.2. BIOLOGICAL EFFECT OF SLEEP

Although it is widely recognized that individuals with chronic kidney disease have poor sleep quality, little is known about the physiological mechanisms that cause this. According to Hildreth, persons with CKD frequently includes sympatho-vagal imbalance as a result of baroreceptor reflex function impairment, which causes sympathetic nervous system hyperactivity and decreased vagal tone.[29,30] Sleep is escorted by a decrease in sympathetic activity and an increase in vagal tone in healthy people, resulting in a nocturnal drop in blood pressure.

Patients with sleep problems that cause hypoxia and sleep fragmentation, on the other hand, have been confirmed to have higher sympathetic nervous system stimulation and less parasympathetic activity, resulting in a lower nocturnal blood pressure drop.[31]

The renin-angiotensin-aldosterone system is influenced by the autonomic nervous system's control of blood pressure during sleep. As blood pressure drops during sleep, plasma renin activity and aldosterone rises in response. There are oscillations in cardiac sympatho-vagal balance and plasma renin levels while a person goes through cycles of rapid eye movements (REM) and non-REM (NREM) sleep. NREM sleep, specifically stages 3 and 4, sees an increase in plasma renin activity and aldosterone, while REM sleep has a fall. Patients who have had a night of sleep deprivation do not have this oscillating pattern of PRA.[32]

However, nocturnal PRA and aldosterone secretion are influenced by more than just sleep time. Suppression of slow-wave sleep causes a reduction in sleep quality (stages 3 and 4) Also, nighttime blood pressure dipping was minimized, which would affect the RAA system.[33] The absence of nocturnal blood pressure falling is thought to be a significant risk factor for CKD development. Using carefully timed antihypertensive medicine in the nights to lower nocturnal blood pressure may lessen the risk of CKD progressing to ESRD.[34]

1.4.3. Types of disorders

I. Insomnia
II. Sleep apnea
III. Restless leg syndrome
IV. Excessive day time sleep

Insomnia: Insomnia is the lack of ability to fall asleep or stay asleep and is characterized by poor sleep quality and poor quality of life.

Sleep apnea: Sleep apnea is a chronic sleep disorder which bases recurrent interruption of breath while a person is sleeping. Characteristics of sleep apnea include loud snoring, breathlessness, waking up from sleep, and

daytime sleepiness.

Restless leg syndrome: Restless leg syndrome (RLS), also termed as Willis-Ekbom syndrome, is a sensory-motor disorder demonstrated by unpleasant nocturnal sensations in the lower limbs that are comforted by movement. These sensations generally happen deep within the muscle of the leg.

Excessive day time sleep: Excessive daytime somnolence (EDS) is well-defined as the lack of ability to stay awake or alert throughout the course of the day, resulting in sleepiness or involuntary dozing during passive (reading, watching television) or active (driving, conversation) daily activity.

Patients with ESRD classically exhibit poor sleep architecture as measured objectively on polysomnographic studies. In a comprehensive review, ESRD patients had short, fragmented sleep with total sleep times between 260-360 min.

1.5. Quality of life

Patients' awareness of their well-being and patient-reported outcomes (PROs) are becoming an essential part of assessments of the human cost of chronic illnesses and the assessment of the impact of therapeutic interventions. Measures of health- related quality of life (HRQOL) have not only become widespread investigative tools, but have been used in a determination to explain and alter models of health care provision. To date, there have been very few large-scale studies that have investigated the determinants of HRQOL in chronic kidney disease (CKD) patients not on dialysis, or the evolution of HRQOL over time using PROs.

The quality of life of CKD patients is a frequently overlooked yet critical consideration when evaluating their overall medical care.[35] The importance of measuring HRQOL has been underscored by recent studies indicating an association between various HRQOL measures and mortality and hospitalization rates in dialysis patients.[36]

Health-related quality of life (HRQOL) is known to be reduced in patients with CKD, and the presence of anemia appears to be associated with exacerbation of HRQOL impairment

2.0. REVIEW OF LITERATURE

1) **FAM Shaheen1, Muhammad Ziad Souqiyyeh1, Besher Adib Al-Attar1, Ayman Karkar2, Ayman Mohammad Hikmat Al Jazairi3, Laila Siraj Badawi4, Omar Mahmoud Ballut5, Ali Hassan Hakami6, Mohammad Naguib7, Mohammed Attiah Al-homrany8, Majdah Yasin Barhamein9, Adel Mansoor Ahmed10, Maher Mohammad Khardaji11, Said Abduslam Said12(7-May-2011)** was directed a study on Prevalence of anemia in predialysis chronic kidney disease patients. The study patients were enlisted from the nephrology clinics in 11 different medical centers dispersed all over the regions of the kingdom of Saudi Arabia (KSA). They conducted a multi-center cross-sectional study of a cohort of CKD patients who have not started dialysis. There were 250 study patients who achieved the criteria for the study. The patients were stratified according to their GFR as follows: stage 1: 19 patients, stage 2: 35 patients, stage 3: 67 patients, stage 4: 68 patients, and stage 5: 61 patients. The prevalence of anemia was raised for the hemoglobin levels below 12 g/dL (the level at which the evaluation of anemia in CKD should be originated) in the different stages of CKD, that is, 42%, 33%, 48%, 71%, and 82% in the stages from 1 to 5, respectively. The prevalence was also elevated for the hemoglobin levels below 11g/dL (the minimum hemoglobin level at which therapy should be initiated with erythropoietin), that is, 21%, 17%, 31%, 49%, and 72%, respectively for stages from 1 to 5. In conclusion, we found a large prevalence of anemia among the CKD population in Saudi Arabia, and the burden of patients who require treatment with erythropoietin is considerably large. Though, the response to therapy will not require large doses according to the accessibility of long-acting erythropoiesis stimulating agents, which will extract the therapy more suitable and less expensive.
2) **Samrad Mehrabi 1,2,*, Saman Sarikhani 1, Jamshid Roozbeh 1, (3January 14, 2017)** were directed a study on Sleep Quality in Patients Undergoing Long-term Hemodialysis Using the Pittsburgh Sleep Quality Index. It was a cross-sectional study design. 197 patients on maintenance hemodialysis were sequentially included from three medical centers in Shiraz, southern Iran. They completed the Pittsburgh sleep quality index. Serum calcium, phosphorus, and hemoglobin levels were checked. They also evaluated the neck circumference, dialysis shift, dialysis plan, diabetes history, body mass index (BMI), age, and sex. From a total of 197 patients, 124 cases were men. The mean age of the patients was 54.46 ± 14.84 years. Poor quality of sleep was frequent in 90.86% of the cases. Age, BMI, a history of diabetes mellitus and the product of calcium and phosphorus were independent factors affecting the quality of sleep. Serum calcium and phosphorus levels, hemoglobin, sex, dialysis shift, dialysis plan, neck circumference and dialysis quality showed to have no major effect on the quality of sleep. Poor quality of sleep is very common in patients on maintenance hemodialysis. Additional studies are essential for better understanding of risk factors allied with the poor quality of sleep to find conceivable treatments for these patients.
3) **Cácia Mendes Matos et al. Int J Artif Organs. 2013.** Conducted a study on Prevalence and management of anemia in hemodialysis patients in a Brazilian population of predominantly African

descent. It was cross-sectional study of 1,263 MHD patients enrolled in the Prospective Study of the Prognosis of Chronic Hemodialysis Patients (PROHEMO) in Salvador, Brazil 2005-2009.88.0% black or mixed race; age 49.0 ± 14.7 years; 96.6% receiving erythropoietin, median = 6,000 units/week. In patients on MHD for more than 180 days, 67.4% had hemoglobin.

4) **Maria Carolina Cruz, Carolina Andrade, […], and Ricardo de Castro Cintra Sesso** was conducted a study on Quality of life in patients with chronic kidney disease. It was a cross sectional study design. 191 patients were participated in the study, in this 155 were predialysis CKD patients and 36 were on HD. The total sample of predialysis CKD patients was divided into five stages according to GFR and subsequently grouped into three groups (stages 1+2, 3 and 4+5). Quality of life was rated by the Medical Outcomes Study Short Form 36-Item (SF-36) and functional status by the Karnofsky Performance Scale. Clinical, laboratory and sociodemographic variables were investigated. In this study, we observed a negative impact on the QOL of patients in the early stages of CKD, although we were not able to detect a significant association between the stages of the disease and the SF-36 domains. Quality of life is decreased in renal patients in the early stages of disease. No association was detected between the stages of the disease and the quality of life. It was possible to establish sociodemographic, clinical and laboratory risk factors for a worse quality of life in this population.

5) **Rahele Sabet, MSc, Mohammad Mehdi Naghizadeh, MSc, and Sousan Azari, MSc** was Conducted a study on Quality of sleep in dialysis patients. This was a cross-sectional study carried out during August -December 2009 in Shariati Dialysis Center, Fasa University of Medical Sciences. Data were gathered on 61 patients receiving a hemodialysis treatment. Quality of sleep was measured using the Pittsburgh Sleep Quality Index (PSQI) in dialysis patients in association with the main clinical and biochemical variables. Logistic and multiple linear regressions were used to assess predictors of sleep quality. Forty-five subjects (73.8%) reported poor sleep quality defined as a global PSQI score > 5. As the age ($p = 0.036$) and duration of dialyses ($p = 0.022$) increased, sleep quality decreased. Significant differences were found between sex and sleep quality ($p = 0.044$). Sleep quality problems had a significant association with MCV ($p = 0.025$).Poor sleep quality is a very common problem in dialysis patients. Assessment and management of sleep quality should be an important component of care giving to these patients. Large prospective longitudinal studies are needed to confirm the high prevalence of impaired quality of sleep and its related factors while controlling confounding variables.

6) **Eliane Roseli Winkelmann, Leila Mariza Hildebrandt, Dulce Aparecida Barbosa, Christiane de Fátima Colet Eniva Miladi Fernandes Stumm** were conducted a study on Quality of life of chronic kidney patients on hemodialysis and related factors. It was a cross sectional study. 183 chronic renal patients undergoing hemodialysis in the state of Rio Grande do Sul, Brazil were included. A sociodemographic and clinical questionnaire, Kidney Disease and Quality of Life Short-Form, Beck Depression Inventory and Morisky Medication Adherence Scale – eight items were used. Among the variables, comorbidities, complications of kidney disease and intercurrences during and after hemodialysis were evaluated. The analysis was performed with descriptive and analytical statistics. 55.2% of the patients were 60 years old or older, 35.0% were hypertensive, with regular quality of life, average of 62.61. Scores below average in the dimensions of quality of life were mainly associated with repetitive infections and edema as complications of the disease, pain during hemodialysis and weakness afterwards. Low drug adherence resulted in a worse quality of life, impacting ten of the 20 dimensions evaluated and depression in all, except for patient satisfaction. Decreased quality of life in this population is associated with miserable symptoms, complications such as repetitive infections, pain and anemia, weakness after the dialysis session and low medication adherence. Actions aimed at changing these factors can promote well-being.

7) **Badema C ˇengic´. Halima Resic´. Goce Spasovski. Emir Avdic´. Azra Alajbegovic´** were conducted a study on Quality of sleep in patients undergoing hemodialysis Two hundred HD patients from the Hemodialysis Clinic, Bosnia and Herzegovina, were enrolled in the study. There were 122 men and 78women with a mean age of 56.8 ± 14.3 (range20–85) years and a mean HD duration of 62.6 ±57.0 months. We used the Pittsburgh Sleep Quality Index (PSQI) and the Health Survey for Dialysis Patients (SF- 36). Seventy-three percent of patients showed a poor SQ response. The average sleep latency of patients was 48.2 min, and the average sleep duration was 4.9 h. Ninety-eight percent of patients experienced some variety of sleep disturbances on weekly basis. The most common sleep disturbances were insomnia (84.5%), day and night sleep reversal (39.0%), excessive daytime sleepiness (EDS) (34.0%), nightmares (25%) and restless legs syndrome (RLS) (20.5%). The most frequent causes of sleep disorders were snoring (47%), pain (35%), daytime napping (34%), breathing problems (30%) and pruritus (28%). Ninety-three percent of patients experienced daytime dysfunction and 46.5% of them were taking sleep medications. Younger patients, employed patients and patients in 3rd HD shift showed significantly better sleep quality compared to the

others. Compared with good sleepers, poor sleepers were more frequently on conventional HD and had higher serum phosphate and PTH and expressively lower Hb. The poor Sleep quality in our HD population significantly correlated with their QOL.

8) **Haitham Ezzat and Amr Mohab** conducted a study on prevalence of sleep disorders among ESRD patients and aimed to assess the prevalence of sleep disorders in end stage renal disease patients on regular hemodialysis (group I with 30 patients) and CKD patients (group II with 30 patients) compared to 30 normal population (control group). Additionally to laboratory investigations including creatinine clearance using Cockcroft and Gault formula, hemoglobin level (Hb), blood urea, serum creatinine, albumin, and serum calcium and phosphorus and lipid profile. For hemodialysis subjects, this study was performed on anevening immediately following hemodialysis treatment. The results showed that patients on hemodialysis have sleep disorders, which sleep disorders are common in group I and II than control group. theshare of sleep disorders in hemodialysis patients were as follows: insomnia (69%), followed by obstructive apnea syndrome OSAS (24%), RLS and periodic limb movement PLM (18%), nightmares (13%), EDS (12%), sleepwalking (2%), possible rapid eye movement behavior disorders RED (2%), possiblenarcolepsy (1.4%). While the percentage of sleep disorders in CKD patients were as follows:insomnia (54%), followed by RLS (19%), PLM (12%), OSAS (16%), nightmares (15%), EDS (15%),sleepwalking (4%), possible RBD (3%), possible narcolepsy (1%). There was inverse correlationbetween sleep disorders and Hb, albumin and creatinine clearance; also there was positivecorrelation between sleep disorder and phosphorus. We concluded that the sleep disorders arecommon in CKD patients either on conservative management or on regular hemodialysis. Treatment of anemia, hyperphosphatemia and hypoalbuminemia may improve sleep disordersamong those patients.

9) **Melissa E. Stauffer, Tao Fan** were conducted a study to determine the prevalence of anemia in subjects with CKD. The analysis was done in adults aged >18 years those who participated in both interview and exam components of survey. Three components were assessed: the prevalence of CKD, the prevalence of anemia in subjects with CKD, and self-reported treatment of anemia. Anemia was defined as serum hemoglobin levels≤12g/dL in women and ≤13g/dL in men. They found that an estimated 14.0% of US adult population had CKD. Anemia was twice as prevalent in people with CKD (15.4%) and in general population (7.6%). The prevalence of anemia increased with stage of CKD, from 8.4% at stage 1 to 53.4% at stage 5. The study concludes the prevalence and treatment of anemia in CKD as, a total of 22.8% of CKD patients with anemia reported being treated for anemia within the previous three months – 14.6% of patients at CKD stages 1-2 and 26.4% of patients at stages 3-4.

10) **Carine Poppe, Geert Crombez, Ignace Hanoulle, Dirk Vogelaers, Mirko Petrovic** were conducted a cross-sectional study in CKD population to evaluate whether acceptance is associated with a better health quality of life, both physical and mental and whether personality characteristics influences acceptance and quality of life, even after controlling for some putative confounding variables. Their sample of 99 patients had a mean duration of CKD of 10.81 year and a mean estimated glomerular filtration rate by Modification of Diet in Renal Disease (MDRD) – formula of 34.49ml/min (SD-21.66). They concluded that acceptance is an important positive variable in accounting for quality of life. These results provide a better understanding of psychological determinants of quality of life in CKD, which can initiate another approach of these patients.

11) **Salman Hussain et al. J Evid Based Med. 2019 Nov.** conducted a study on Anemia prevalence and its impact on health-related quality of life in Indian diabetic kidney disease patients. It was a crosssectional study design. A total of 323 patients completed the study. The mean ± SD age of patients was 56 ± 11.25 years, and 51.7% were female. Mean duration of diabetes was 9.6 ± 4.57 years. A total of 227 (70.27%) had anemia as per the WHO criteria. Linear association was observed between the eGFR and hemoglobin. Patients with a confirmed diagnosis of type 2 diabetes mellitus (T2DM), and had any stages of CKD (stages I to IV), based on their estimated glomerular filtration rate (eGFR) were enrolled in the study. Anemia was defined using the World Health Organization (WHO) criteria and quality of life was assessed using the EQ-5D scale. All the statistical analysis was performed using SAS v9.4.This study reported a high prevalence of anemia and impaired quality of life among DKD patients. Routine screening of anemia can be the most preventive measure to deal with this burdening co- morbid condition.

3.0 AIM AND OBJECTIVES

3.1 Aim

To explore the Impact of Anemia, Quality of Life and sleep disturbances in CKD and Hemodialysis patients.

3.2 Objectives

- ✓ To explore the quality of life in Hemodialysis patients by KDQOL – 36
- ✓ To evaluate the impact of anemia in Non-hemodialysis and Hemodialysis patients from patients reports
- ✓ To assess the sleep disturbances in Non-hemodialysis and Hemodialysis patients by PSQI scale.
- ✓ To monitor the patients' health and physical

condition.
- ✓ To educate the patients about the sleep and factors effecting it.
- ✓ To evaluate the impact of anemia on HRQOL, in patients with CKD at varying stages.

4.0. NEED OF THE STUDY

- Anemia is a common consequence of CKD and is consistently associated with greater mortality, hospitalization and CKD progression. Effective treatments reduce the risk of adverse clinical outcomes and decrease the burden of anemia and its management in CKD. It is well established that presence of anemia in patients with CKD is associated with poor quality of life. It is important to accurately diagnose anemia in CKD patients and understand the prevalence of anemia because even though anemia is a common contributor to poor quality of life in CKD patients, it is also likely to be the factor that is most responsive to treatment.
- In patients with chronic disease, sleep disorders are more prevalent with an additional morbidity and mortality burden. The complex and dynamic relationship between sleep disorders and CKD remains relatively little investigated.
- Poor quality of sleep and lack of sleep reduces overall quality of life and may lead to a host of other complications including impaired immune system and risk for cardiovascular diseases.
- It is crucial to understand sleep disturbances and its relationship associated with other complications in order to reduce mortality and improve quality of life and sleep in CKD patients.

5. METHODOLOGY

5.1. Study Site

This study was carried out in Chalmeda Anand Rao Institute of Medical Sciences (CAIMS), Karimnagar, and Telangana.

5.2. Study Design

Hospital basedcross-sectional study conducted in In-patients and Out-patients. The data were collected quantitatively and qualitatively to determine level of adherence and symptom burden in patients respectively.

5.3. Study Duration

This study was conducted over a period of six months.

5.4. Study Criteria

- **Inclusion Criteria**
- ✓ Patients who are only on hemodialysis
- ✓ Patients with CKD and not on Hemodialysis
- ✓ ≥ 16 years

- **Exclusion Criteria**
- ✓ Patients with neurological disorders
- ✓ Patients with significant mental illness
- ✓ Patients with comorbidities (CHF. Unstable angina, COPD, arthritis were excluded)
- ✓ Patients who use sleep medications

5.5. SOURCE OF DATA

By communicating with patients and their representatives, patient data records (In-patient and Out-patient)

5.6. PARAMETERS TO BE CONSIDERED:

- ✓ Demographic details
- ✓ History of dialysis
- ✓ Duration of dialysis
- ✓ Co-morbidities
- ✓ Sleep pattern
- ✓ Sleep latency
- ✓ PSQI
- ✓ Sleep duration
- ✓ Anemia
- ✓ Quality of life (KDQOL)

5.7. Data Collection Form

Based on inclusion and exclusion criteria the patients were selected and data is collected in predesigned data collection form which includes patients demographic details, history of dialysis, complaints of sleep disturbances, and reports of blood related to anemia and questioners of sleep and quality of life.

5.8. Study Procedure

TheStudy approval from the Institutional Review Board (IRB) as well as head of the hospital was obtained. The study protocol and data collection form was submitted for a review and a written/oral consent was obtained from head of hospital. After getting permission from IRB, patients matching for the study criteria was identified by regular review of patient's record during study period and documented in a predesigned data collection form. The study was conducted at nephrology department, dialysis unit and outpatient departments by communicating/interviewing the patient and their representatives. Patient data was collected from patient case records filled by physicians, nurses, pharmacist and other healthcare professionals. All the details were kept confidential. Later for analysis, the data collected was entered into Microsoft excel database and subjected for further analysis. Data collected includes demographic details, past medical history, family history, and social history, diagnosis on admission, laboratory investigations, treatment chart, date of admission and date of discharge. Additionally, sleep data and quality of life were collected using PSQI scale and KDQOL-36. Later for analysis, the data collected was entered into Microsoft Excel Database and subjected for further analysis.

PSQI Scale

PSQI is abbreviated as Pittsburgh Sleep Quality Index. It is used to measure quality of sleep and to help

distinguish between individuals who experience poor sleep versus individuals who has good sleep quality.The PSQI consists of 19 self-rated questions and five questions rated by the bedpartner or roommate. The latter five questions are used for clinical information only, are not tabulated in the scoring of the PSQI. The 19 self-rated queries assess a wide variety of factors relating to sleep quality, including assessments of sleep duration and latency and of the frequency and severity of precise sleep-related problems. These 19 items are assembled into seven domains of sleep difficulties.

Category consist of sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction.

In scoring the PSQI, seven component scores are poor, each scored 0 (no difficulty) to 3 (severe difficulty). The components scored are summed to produce a global score (range 0-21). Higher scores designate worse sleep quality.

KDQOL-36

The kidney disease quality of life 36-item short form survey (KDQOL-36) is one of the most commonly- used processes of HRQOL for patients with ESRD. The KDQOL-36 comprises both generic and ESRD specific HRQOL scales, allowing for comparison with other clinical subgroups while also providing specificity and responsiveness to change for elements of HRQOL significance to patients with ESRD.

To facilitate implementation and interpretation of the KDQOL-36 in clinical practice, we examine whether there is psychometric support for a composite score of items from this measures three kidney- targeted scales and to estimate normative values short form (SF-12) version 1 physical component summary (PCS), SF-12 version 1 mental component summary (MCS).

The KDQOL-36 has five scales, comprising two generic HRQOL scales from the SF-12 version 1 (12 items total) and three kidney- specific scales (24 items). The SF-12 PCS and MCS are scored on T- score metric, with higher scores signifying better HRQOL.

STATISTICAL ANALYSIS

Data was collected and documented in data collection form and analyzed using

Data presented mean, standard deviation, in some cases even % are used, correlation between two data sets person sons method is used, more than two sets of datapaired annova is used and t test.

The description of the data done was written in the form of mean ± SD for qualitative data was done to find the statistical significance differences between the groups, where p less than 0.05 taken as the significance.

Pearson correlation co-efficient

Pearson correlation co efficient also called as Pearson R statistical test. Pearson's correlation coefficient (*r*), measures strength ofthe linear relationship between two variables. Linear relationship can be either positive or negative.

Formula

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$$

r = correlation coefficient

r = 1, it indicates perfect positive relationship between the variables

r = 0, it indicates no linear correlation

r = -1, it indicates perfect negative relationship between the variables

Whenever any statistical test is conducted between the two variables, then it is good for doing analysis to calculate the correlation co- efficient for knowing the strength of linear relationship between two variables.

Chi square test

Chi square test also called as chi squared distribution, symbolically represented as X^2. It can be used to comparison of two statistical data sets. This test was primarily introduced by Karl Pearson in 1900 for analysis of categorical data and distribution. So it was called as persons' chi square test. The chi square test was done to check if there is any difference between the observed value and expected value.

Where O_i = Observed value

Ei = Expected value

Independent sample t test

Independent sample t test is a statistical technique; it can be used to analyze the mean of two independent groups. When we take two samples from the same population the mean of the two samples may be identical in independent sample t test. But when samples are taken from two different populations, then the mean of the sample may differ. In this case draw a conclusion about the means of two different populations.

Formula:

Let A and B represent the two groups to compare

Let mA and Mb represent the means of group A and B respectively

Let nA and n B represent the sizes of group A and B respectively

It can be calculated as –

S^2 = Estimator of the common variance of the two samples

S^2 can be calculated as follow

ANOVA

An analysis of variance on ANOVA is a statistical test is used to determine the influence that independent variable have on the dependent variable in a regression study. The two way ANOVA is an extension of the one way

ANOVA. There are two independent variables, hence called as two way ANOVA.

6. RESULTS

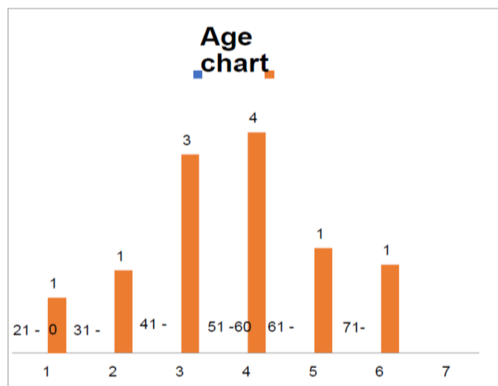
A cross-sectional study was conducted in in-patient and outpatient setting of Chalmeda Anand Rao Institute of Medical Sciences for a period of 6 months. A total of 105 patients of each in anemia, sleep disturbances and quality of life were recruited under inclusion and exclusion criteria.

Data on disease distribution of Anemia

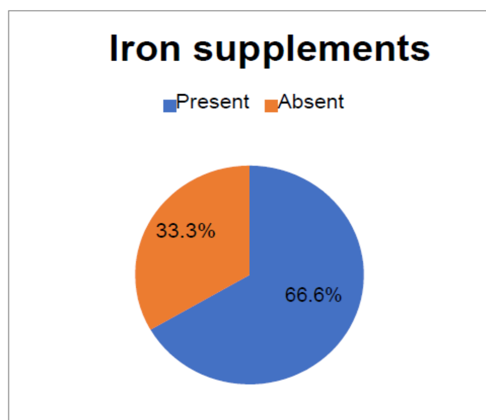
A total of 105 patients were taken for the analysis of data in which the subjects were classified according to the stages of disease progression. The patients undergoing hemodialysis (N=73) and Non hemodialysis (N=32). Overall people included in study of 10 patients, 15 patients, 36 patients, 40 patients, 19 patients, 16 patients were of ages 21-30, 31-40, 41-50, 51-60, 61-70, 71-80 respectively (table-5).

Table 5: age wise categorization of data.

Age	No of patients	Percentage %
21- 30	10	9.52
31- 40	15	14.2
41-50	36	34.2
51- 60	40	38.09
61- 70	19	18.09
71- 80	16	15.23

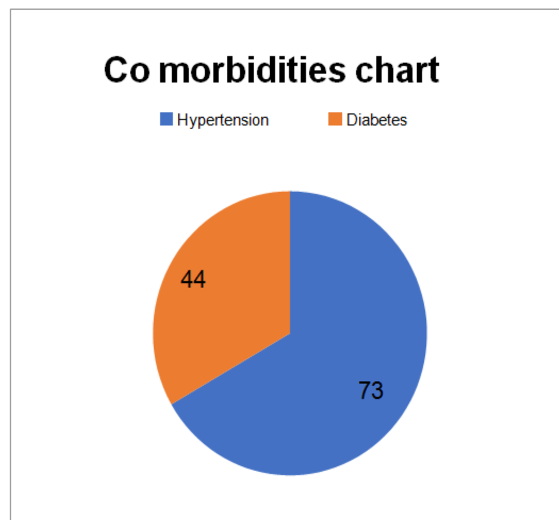


Graph 1.



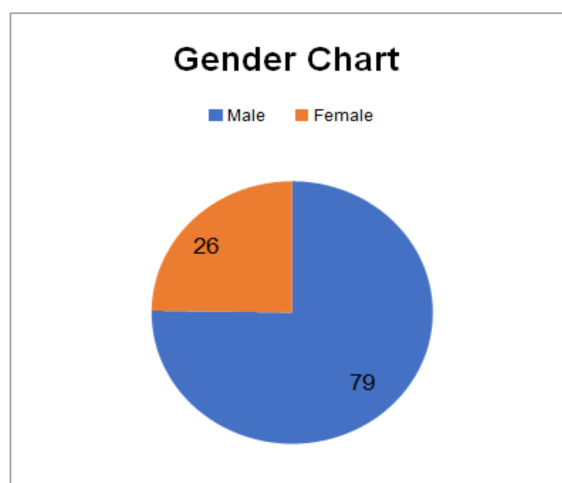
Graph 2.

In the above pie-chart -66.6% of patients were on iron supplements and 33.3% of patients were not on any therapy.



Graph-3.

In the above pie-chart – 73% 0f patients were hypertensive patients and 44% patients were diabetes patients.



Graph-4.

In the above pie-chart – 79% of patients were male and 26% patients were females.

Laboratory and clinical data profile

A total patient's population of 73 HD patients which includes 58 males (79.4%) and 15 females of (20.54%). Age wise categorization was made. We found 32 patients from age group 51-60, 28 patients are from age group 41-50, 12 patients from each of age groups 61-70, 71-80, 31-40, and 9patients from age group 21-30. The median age of the subjects i.e., patients in the study was 55.5 years. Maximum patients involved in the study are non-smokers, non- alcoholics, married.

Comorbidities like hypertension and diabetes mellitus are mostly seen in the patients. Hypertension accounts 86.3%, DM of about 36.98% and all the other

comorbidities were excluded.

The prevalence of anemia, a total population of 73 HD patients has 87.67%.

A total patients of 32 Non-HD patients which include 21 males(75.23%) and 11 females (24.76%). Age wise categorization was made. We found 8 patients of each from age groups 41- 50, 51-60, 7 patients, 4 patients, 3 patients, 2 patients from age groups 61-70, 71-80, 31-40, 21-30 respectively. The median age of the subjects i.e., patients in the study was 50.5 years. Maximum patients involved in the study are non-smokers, non-alcoholics, married.

As stages of CKD increase GFR decreases, the prevalence of anemia includes stage 1&2 (16.12%), stage 3a (22.5%), stage 3b (25.8%) and stage 4 (29.03%).

For the patients undergoing hemodialysis, classified into three categories based on hemoglobin levels their iron profiles are checked for relation. The data includes mean± standard deviation.

Table 6: categorizing iron profile according to hemoglobin levels.

Parameters	Hemoglobin<10gr/dl	Hemoglobin10-12gr/dl	Hemoglobin>12gr/dl
No. of people	21 (80.7%)	4 (15.3%)	1 (3.84%)
Hypertension	16 (61.5%)	2 (7.69%)	1 (3.84%)
Diabetes	3 (11.5%)	2 (7.69%)	1 (3.84%)
Iron	60.22857± 35.94915	36.4±32.68394	34.7
TIBC	265.9524±74.92895	247.5±61	380
Transferrin	185.7143±52.33272	173±42.48137	266
Ferritin	434.8095±427.8432	798±947.1315	3000
PTH	378.8286±275.6915	151.275±91.55528	112

Table 7: Relation between different Parameters and Hemoglobin.

Parameters	Total	Hb<10	Hb 10-12	Hb>12	F value	P value
Age(years)	50.09±12.88	49.93±12.27	52.12±15.10	44	0.1425	0.934
Wt (kg)	53.91±9.34	53.48±9.39	56.6±9.59	56	0.281	0.838
GFR(ml/min)	9.783±3.85	9.23±3.36	13.84±5.2	11.31	3.852	0.01*
Hb (gr/dl)	7.539±1.91	7.11±1.62	10.37±0.34	12.1	10.673	0.00000226*
RBC(10^6/ul)	2.90±1.31	2.66±0.69	3.66±0.42	12.1	28.4227	1.9E-14*
Urea(mg/dl)	137.71±84.74	138.73±56.16	133±47.9	110	0.11125	0.953
sr.cr(mg/dl)	1.48±2.14	7.77±2.7	5.31±1.7	6.6	2.24	0.085

***p- value <0.05, Hb- gr/dl**

From the above table, it shows that Hb and GFR has an positive impact (p- value- 0.01)

Table 8: Demographics of patients according to hemoglobin levels.

Demographics	Total	Hb <10 gr/dl	Hb 10-12 gr/dl	Hb >12gr/dl
Age (years)	50.09±12.88	49.93±12.27	52.12±15.10	44
Male	79.40%	78.12%	87.50%	100.00%
Female	20.54%	21.87%	12.50%	-
HTN	86.30%	87.50%	75%	100
DM	36.98%	34.37%	50	150
Fe supplements	84.90%	87.50%	50%	100%

HTN – Hypertension, DM- diabetes mellitus, Hb- Hemoglobin

Data on disease distribution of Sleep

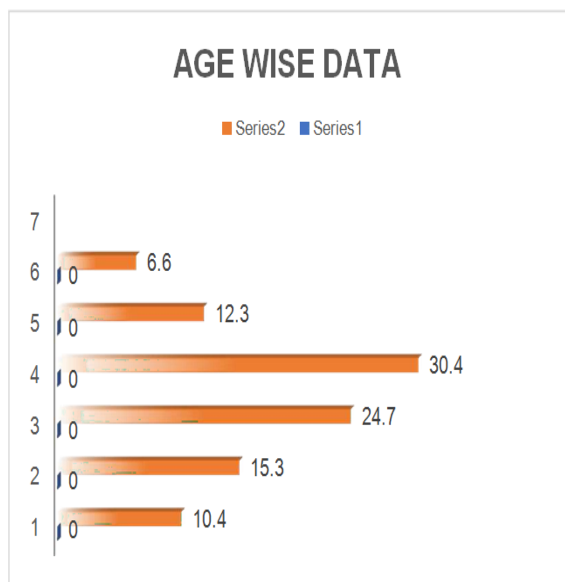
A total of 105 patients were taken for the analysis of data in which the subjects were classified according to the scoring of PSQI scale. The scoring in scale shows ≤5 score are good sleepers and scoring > 5 are poor sleepers.

A total population of 105 patients, 68 patients were taken as poor sleepers (64.76%) and 37 patients were taken as good sleepers (35.23%) which includes both HD and Non-HD patients. Gender wise calculated and found sleep disturbances in males72.38% and females 27.61%.

Age wise characterization was calculated i.e., age of 20-29 found to be 10.47% patients, 30-39 age group of 15.23% patients, 40-49 age group of 24.76% patients, 50-59 age group of 30.47% patients, 60-69 age group of 12.38% patients, 70 -79 age group of 6.66% patients.

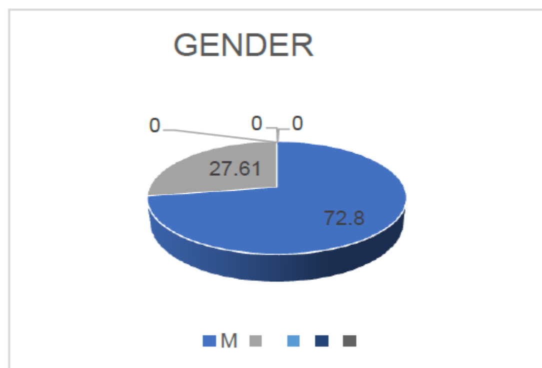
Table 9: age wise categorization of data.

Age(years)	Number	Percentage
20 - 29	11	10.47%
30 - 39	16	15.23%
40 - 49	26	24.76%
50 - 59	32	30.47%
60 - 69	13	12.38%
70 - 79	07	6.66%



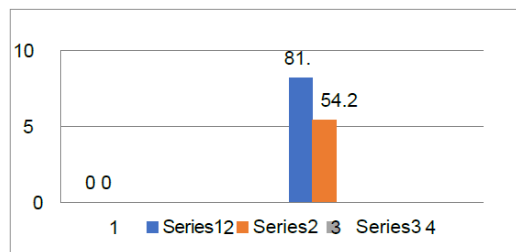
Graph -5.

In the above graph – age wise data was recorded



Graph–6.

In the above pie-chart – overall sleep disturbances in males(72.83%) and in females (27.61%).



Graph–7.

In the above graph – 81.9% were hypertensive patients and 54.28% were diabetes patients.

Laboratory and clinical data profile

Comorbidities like hypertension and diabetes mellitus are mostly seen in the patients. Hypertension accounts 81.9%, Diabetes mellitus accounts 54.28% and all the other comorbidities were excluded.

A total population of 105 patients includes Non-hemodialysis and hemodialysis, 37 good sleepers age wise categorization includes age group of 20- 29 includes patients of 4, age group of 30-39 includes patients of 5, age group of 40-49,50-59, 60-69, 70-79 includes patients of about 10, 7, 8, 3 respectively. Gender wise includes males of 26 and females of 11. Comorbidities includes of 29 patients hypertensive and 21 patients of diabetes.

A total population of 105 patients includes Non-hemodialysis and hemodialysis, 68 good sleepers age wise categorization includes age group of 20- 29 includes patients of 7, age group of 30-39 includes patients of 11, age group of 40-49,50-59, 60-69, 70-79 includes patients of about 16, 25, 5, 4 respectively. Gender wise includes males of 50 and females of 18. Comorbidities include of 57 patients Hypertensive and 36 patients of Diabetes.

Table 10: comparison of data of good sleepers and poor sleepers.

Variables	Good sleepers (n=37)	poor sleepers (n=68)	p- value (unequal)
Age (years)	49.48±19.03	47.25±13.2	0.4297
Hb	8.637±1.49	8.453±1.852	0.5812
RBC	3.221±0.599	3.033±0.71	0.1543
Urea	158.27±30.05	140.47±38.61	0.010*
Sr.cr	8.248±2.83	7.548±1.87	<0.0000001*
Wt	53.59±5.209	51.83±4.244	0.08
GFR	27.62±23.98	9.46±5.77	<0.00000511*

***p-value <0.05, Hb- gr/dl, urea-gr/dl, sr.cr- gr/dl, wt- kgs, GFR- ml/min**

From the above table, their shows a positive impact of sleep quality with urea (p-value-0.010), serum creatinine (p-value-<0.0000001) and GFR (p-value- <0.00000511).

Table 11: Comparison of demographic between good sleepers and poor sleepers.

Variables	Good Sleepers	Poor Sleepers
Age	49.48±19.03	47.25±13.2
HTN	81.60%	83.82%
DM	56.75%	52.94%
Males	70%	73%
Females	29.72%	26.47%

Data on disease distribution of Quality of Life

Quality of life decreases in all stages of CKD, A total population of 105 patients were taken to assess the quality of life. Due to less number of subjects we calculated quality of life based stages of CKD and HD.

Laboratory and clinical data profile

A total population of 105 patients were assessed the quality of life. Dimensions showing lower values for the variables in stages wise were found to be in CKD 1&2 – Energy/ Fatigue (66%), Emotional well-being (70.9%), CKD 3 – Energy/Fatigue (72.64%), Emotional well-being (73.17%), CKD 4 – Energy/Fatigue (68.75%), Emotional well-being (70.3%), CKD 5 – Role of limitations due to physical health and emotional health (0%) and HD – Role of limitations due to physical and emotional health (0%).

With the regard of age, there was a negative correlation with the mean PCS and MCS.

Table 12: impact of quality of life with CKD progression.

Variables	CKD 1& 2 (N= 15)	CKD 3 (N= 17)	CKD 4 (N= 12)	CKD 5 (N= 20)	HD
Physical functioning %	100	105.8	91.6	52.5	46.6
Role limitations due to physical health %	100	105.8	75	0	0
Role limitations due to emotional health %	100	105.8	75	0	0
Energy/ Fatigue %	66	72.64	68.75	54	51.6
Emotional well-being %	70.9	73.17	70.3	54	51.2
Social functioning %	72.5	84.5	74.2	61.87	54.93
Pain %	86.16	81.32	76.87	64.125	54.72
General health%	122.4	91.6	77.08	64.5	54.4
Health change %	91.6	80.88	83.3	62.5	50.69

From above data, the p- value was calculated and known to be p- value 1.41.

7. DISCUSSION

The aim of this particular part of this study was to identify the risk factors associated with presence of anemia in patients of chronic illness i.e. CKD. The study finds the relationship between the anemia that is calculated with Hb levels and outcome in patients with CKD. As anemia is the most commonly noted risk factor in CKD patients. As data states that severe the CKD was associated with greater prevalence of anemia. Even there are various pathophysiological methods which prove the condition as true (Above mentioned in figure-3). Anemia is common in CKD i.e. more frequently in dialysis (HD) patients as there with a relatively greater loss of anemia.
Anemia is associated with the higher risk of mortality, hospitalization, CKD progression etc. The effects tended to increase with anemia severity. So that the Hb less than 10 gr/ dl patients data were being compared with other Hb patient whose Hb values are greater.

Anemia is also a factor for the poor quality of life in CKD patients but it is most responsive tothe treatment. Treatment of anemia is done with iron supplements and erythropoiesis stimulating agents.

The description of the data done was written in the form of mean ± SD for qualitative data was done to find the statistical significance differences between the groups, where p less than 0.05 taken as the significance.

The correlation between haemoglobin and GFR was found (p = 0.0312) which states it has a relatively i.e. Hb has a positive impact on GFR value.

Many factors contribute to high prevalence of sleep problem in hemodialysis and dialysis patients including mental health status, metabolic status, treatment related factors.at present sleep disturbances in CKD patients, at any stage are not receiving any treatment for sleep.

When data is collected the patients in CKD group has a good quality compared to that of patients on hemodialysis. The factors like pain, dialysis shift, time of dialysis may also affect the sleep pattern, our results shown a positive relation between urea and sleep quality (p= 0.001), sr.cr and sleep quality (p= <0.0000001), GFR and sleep quality (p= <0.00000051).

Our results indicate low QOL scores in the early stages of CKD for some variables. As the progression of disease i.e., CKD to HD although we didn't demonstrate significant decrease. Mean values of both the components are slightly reduced in stages of CKD 1-3, and further progression there is a significant decrease in variable, mean less than 60%.

In this study, the CKD progression and components' of scale has a negative correlation. In the studies a relevant decrease in the QOL was also not identified. In the literature, the decrease in the physical domains of QOL in the advanced stages of CKD, this was also identified in our study.

It is also known, however, the subjective assessment of QOL is multifactorial, and the progression of renal dysfunction may not be the only factor for the deterioration of QOL. Factors like sociodemographic

factors (age, ethnicity, gender, income, education, professional activity, etc) can also be associated with the deterioration of QOL. Additional factors, adaption to disease and treatment which is lifelong, satisfaction with staff whose gives treatment, satisfaction with procedure, social support, all this may interfere in the assessment of QOL.

8. CONCLUSION

In the conclusion, anemia is the first known systemically reviewed complication in the progression of the disease. As the kidney plays an important role in producing erythropoietin, decreased function of kidney causes improper function which automatically results in burden. Primary monitoring of anemia i.e., in early stages is better. Appropriate treatment that not only manages anemia but also reduces the negative outcomes, that may reduce burden of anemia.

The results of the study concludes that however the poor sleepers are common in HD patients and the quality of sleep slightly decreases in early stages of disease. Many sleep disturbances are seen but at present no treatment is specified, as of now. Sleep disturbances are referred as to one of the most important distressing symptoms which affect QOL and the mortality risk.

Quality of life is decreased in kidney damaged patients in early stages of diseases. But, later after the progression even QOL has negative impact on CKD staging. However, the variables causing changes in QOL cannot be changed but efforts should be made to reduce those factors (age, gender).

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