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EPIDEMIOLOGY OF HEMODIALYSIS IN CHRONIC RENAL FAILURE PATIENTS IN HADITHA GENERAL HOSPITAL

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ABSTRACT

Background: Hemodialysis is one of three renal replacement therapy, the other two being renal transplant and peritoneal dialysis .it's a process of purifying the blood of person whose kidney are not working normally. it's achieves the extra corporeal removal of waste products such as creatnine and urea and free water from the blood when the kidney are in a state of renal failure. over 2 million people worldwide received hemodialysis. **Objectives**: to determine the epidemiology, etiological factor and out comes among patients with chronic renal failure treated by hemodialysis. **Methods**: A study was performed on patients with chronic renal failure admitted to Haditha _ hemodialysis _ unit during the period between 20th March 2012 to 9th October 2014.A total of 83 patients, 53 male and 30 female constituted the study group. **Results**: there were (63,8%) males patients and (36,2%) females Patient .The mean age of the study patients was(52,8) years. The most frequent age group was (46_60) years with frequency of 34,9%.The prevalence of the various causes of chronic renal failure in this study was : hypertension (HTN), 29% diabetes mellitus (DM) 18% ,ischemic heart disease (IHD) 12%, renal causes 9.6%,epilepsy 2.4%,rheutomological causes 2.4%, rejection transplant 2.4%, cancer 1.2%, unknown causes 23% of the patients. **Conclusions**: The incidences of chronic renal failure are high in al _anbar province, but differ from city to the other. Case fatality rate was high in our governorate. Cardio vascular disease was the leading causes of death. The number of hemodialysis unit is low and the number of chair inside it is not enough for the patients.

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INTRODUCTION

Chronic renal failure (CRF) is a worldwide public health problem with an increasing incidence and prevalence, poor out come and high cost (Xie, 2008). CRF defined as a persistent and irreversibly low glomerular filtration rate (GFR) below 30_40 ml/ minute, regardless of the need for dialysis with a serum creatinine concentration always > 2.5 mg/ dl.The end stage renal disease (ESRD) is the irreversible deterioration of the renal function to a degree that it is incompatible with life without renal replacement therapy (Kernil Eavanaugh, 2016).

Types: There are three types of hemodialysis(HD) conventional hemodialysis, daily hemodialysis, and nocturnal hemodialysis (Https:en.m.wikipedia.org).as below

Conventional hemodialysis: Conventional hemodialysis is usually done three times per week, for about 3–4 hours for each treatment, during which the patient's blood is drawn out through a tube at a rate of 200-400 mL/min. The tube is connected to a 15, 16, or 17 gauge needle inserted in the dialysis fistula or graft, or connected to one port of a dialysis catheter. The blood is then pumped through the dialyzer, and then the processed blood is pumped back into the patient's bloodstream through another tube (connected to a second needle or port). During the procedure, the patient's blood pressure is closely monitored, and if it becomes low, the dialysis attendant can administer extra fluid through the machine.

Daily hemodialysis: Daily hemodialysis is typically used by those patients who do their own dialysis at home. It is less stressful (more gentle) but does require more frequent access. This is simple with catheters, but more problematic with fistulas or grafts. Daily hemodialysis is usually done for 2 hours six days a week.

Nocturnal hemodialysis: The procedure of nocturnal hemodialysis is similar to conventional hemodialysis except it

is performed three to six nights a week and between six and ten hours per session while the patient sleeps.

Advantages

- Low mortality rate dialysis patients.
- Daily trauma.
- Better control of blood pressure and abdominal cramps
- Less diet restriction
- Better solute clearance effect for the daily hemodialysis: better tolerance and fewer complications with more frequent dialysis

Disadvantages

- Restricts independence, as people undergoing this procedure cannot travel around because of supplies' availability
- Requires more supplies such as high water quality and electricity
- Requires reliable technology like dialysis machines
- The procedure is complicated and requires that care givers have more knowledge
- Requires time to set up and clean dialysis machines, and expense with machines and associated staff

History

The first hemodialysis in a human being was by Hass (February 28, 1924) and the artificial kidney was developed into a clinically useful apparatus by Willem Kollf in 1943 - 1945. [4] The first successfully treated patient was a 67-year-old woman in uremic coma who regained consciousness after 11 hours of hemodialysis with Kolff's dialyzer in 1945. According to McKellar (1999), a significant contribution to renal therapies was made by Canadian surgeon Gorden Murray . Murray's work led to the first successful artificial kidney built in North America in 1945–46. [2] Swedish professor Nills Alwall encased a modified version of this kidney inside a stainless steel canister, to which a negative pressure could be applied. Alwall also was arguably the inventor of the arteriovenous shunt made of glass, as well as his canister-enclosed dialyzer, to treat 1500 patients in renal failure between 1946 and 1960.in 1962 Scribner started the world's first outpatient dialysis facility, Seattle artificial kidney center.

Prescription

A prescription for dialysis by nephrologists will specify various parameters for a dialysis treatment. These include frequency (how many treatments per week), length of each treatment, the blood and dialysis solution flow rates, and the size of the dialyzer. The composition of the dialysis solution is adjusted in terms of its sodium and potassium and bicarbonate levels. In general, the larger the body size of an individual, the more dialysis he/she will need. In North America and the UK, 3-4 hour treatments (sometimes up to 5 hours for larger patients) given 3 times a week are typical. Twice-a-week sessions are limited to patients who have a substantial residual kidney function. Four sessions per week are often prescribed for larger patients, as well as patients who have trouble with fluid overload Finally, there is growing interest in short day hemodialysis, which is 1.5 - 4 hr sessions given 5-7 times per week, usually at home. There is also interest in nocturnal dialysis which involves dialyzing a patient, usually at home, for 8–10 hours per night, 3-6 nights per week. Nocturnal in-center dialysis, 3-4 times per week.

Side effects and complications

Hemodialysis often involves fluid removal (through ultrafilteration), because most patients with renal failure pass little or no urine. Side effects caused by removing too much fluid and/or removing fluid too rapidly include low blood pressure, fatigue, chest pains, leg-cramps, nausea and headaches. These symptoms can occur during the treatment and can persist post treatment; they are collectively referred to as the dialysis hangover or dialysis washout. The severity of these symptoms is usually proportionate to the amount and speed of fluid removal. However. These side effects can be avoided and/or their severity lessened by limiting fluid intake between treatments or increasing the dose of dialysis .Since hemodialysis requires access to the circulatory system, patients undergoing hemodialysis may expose their circulatory system to microbes, which can lead to bacteremia , an infection affecting the heart valves (endocarditis) or an infection affecting the bones (osteomylitis). The risk of infection as well as bleeding varies depending on the type of access used. First Use Syndrome is a rare but severe anaphylactic reaction to the artificial kideny. Its symptoms include sneezing, wheezing, shortness of breath, back pain, chest pain, or sudden death. It can be caused by residual sterilant in the artificial kidney or the material of the membrane itself. In recent years, the incidence of the syndrome has decreased, due to an increased use of gamma irradation, steam sterilization, or electron-beam radiation instead of chemical sterilants, and the development of new semipermeable membranes of higher biocompatability. Long-term complications include hemodialysis associated amyloidosis, neuropathy and various forms of heart disease.

Aim of Study: To determine the epidemiology, etiological factor and out comes among patients with chronic renal failure treated by hemodialysis in Haditha general hospital.

MATERIALS AND METHODS

this study was performed on patients with CRF admitted to Haditha hemodialysis unit. During the period between 20th March 2012 to 9th October 2014 .A total of 83 patients 53 male and 30 female were treated firstly by hemodialysis.Data were collected directly from the patients during registration and sessions of hemodialysis were I am manager of that unit and monitoring all the patients during that period. Each patient have special sheets regarding full information and variable investigation(renal function test, abdominal ultrasound, general urine exam, complete blood count, blood suger,lipid profile, blood test for Na,K,Ca and uric acid, chest x-ray, electrocardiogram, echo study, viral screen, liver function tests ,renal CT scan, brain CT scan) done to reach the causes of CRF.For statistical analysis SPSS -20(statistical package for social sciences _ version 20) and CHI _square test was used to analysis the group .percentage in addition to statistical figure a P _value >0.05 was consider to be not significant and P _value <0.05 consider to be significant.

RESULTS

Among the 83 patients studied 53 of them were males and 30 were female and male to female ratio was to be 1.76 : 1 .chi-square not significant (P _ value was > 0.05). In this study hypertension(HTN) and diabetes mellitus(DM) were noticed in a higher percentage among patients in both sexes.

Table 1. Distribution of risk factors

Risk factors	Total No.	Frequency
Hypertension	24	29%
Diabetes Mellitus	15	18%
Ischemic Heart Disease	10	12%
Renal Causes	8	9.6%
Epilepsy	2	2.4%
Graft Rejection	2	2.4%
Rheumatoid Disease	2	2.4%
Cancer	1	1.2%
Unknown cause	19	23%
Total No.	83	100%

Table 2: with respect to the distribution of patients on hemodialysis according to age group .the most frequent age group was (46_60) years with a frequency(34.9%). The mean age group of the study patient was (52.8) years.

Table 2. Age distribution of the patients

Age group / years	Total No.	Frequency
0-15	3	3.6%
16-30	11	13.3%
31-45	17	20.5%
46-60	29	34.9%
61-75	17	20.5%
76-90	6	7.2%
Total No.	83	100%

Distribution of patients according to blood groups show that 44 of the patient from the total 83 patient was blood group (O) with a frequency 53%.

Table 3. Blood group distribution of the patients

Blood group	Total No.	Frequency
O	44	53%
A	19	22.9%
B	18	21.7%
AB	2	2.4%
Total No.	83	100%

Table 4: shows that most patients on the Haditha hemodialysis unit were from Haditha city and Hit were high percentage rate observed. The prevalence of CRF treated by HD in this study was (56.5) patients per million populations (PMP).

Table 4. Distributions of HD patients according to the residence

District	Number	Population Size	Prevalence / 10000
Haditha	34	110 000	3.09
Hit	19	130 000	1.40
AL-Ramadi	12	610 000	0.20
AL-Falluja	9	560 000	0.16
Ana	7	27 000	2.59
Rawa	2	21 000	0.95
Total No.	83	1 468 000	0.56

Figure 1: show the outcome of group study which are on hemodialysis program during two and half years.42 patient (50.6%) died (D), 26 patient are male and 16 patient are female .10 patient (12%) undergoing renal transplant (RT) 7 patient are male and 3 patient are female and 31 patient(37,4%) still on hemodialysis(HD) in the unit, 20 patients are male and 11 patients are female.

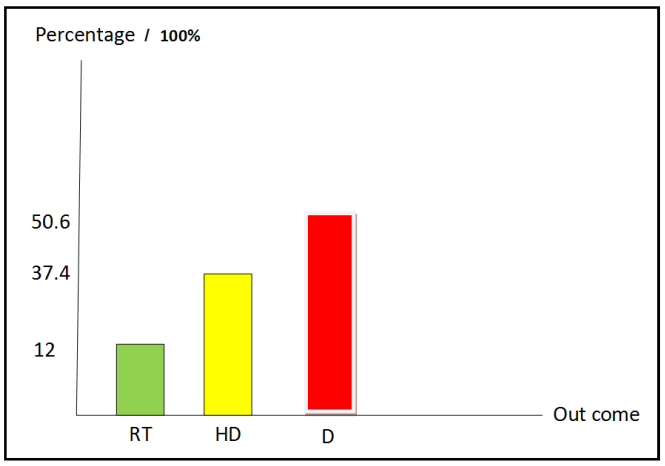

Fig . 1. Outcome of patients

DISCUSSION

The prevalence or CRF patients treated by HD in our study was(56.5) PMP as shown in table(4) but we don't have the real number of CRF patients in our province or country .While the prevalence in the Kingdom of Saudi Arabia (KSA) was (545) PMP from the total number of population with CRF which is 0.05%. And in Egypt was (285) PMP from the total number of population with CRF which is 2.85%. These differences in prevalence attributed to many factors such as gross national product and local environment. In this study, HTN responsible for 29% of cases compatible with other studies as leading cause in Egypt was 36%, while the second cause was DM in 18% while in Egypt 13.5%. In KSA 36% due to HTN and 37% due to DM (Https.www.alriyadh.com). Which are mostly due to high prevalence of both disease in our population associated with natural history and bad control of these disease. Regarding renal causes in this study was 9.6% mostly due to adult poly cystic kidney disease (APKD) which run in these families specially in Haditha and Ana cities (more than 3 cases in each family) which less than in other study in Egypt 16.6% .The unknown causes was 23% which not coccid with other study in Egypt 16.2%, in KSA 15%, its due to poor diagnostic facility specially renal biopsy.The current study show differences between male and female regarding the incidence as 63 .8% male while female was 36.2% which not coccid with other study were predominance of female gender as in Egypt 55% female and 45% male (Https:www. masress.com). High numbers of male partly due to causes of renal failure likes HTN and DM which are more in male gender worldwide, which is not run with other study in our province in 2010 were no big differences between both sexes. Most cases between age (46_60) years (middle age group) in 34.9% as shown in table (2) which differ from other study as in Egypt 90 % of cases lower than 50 years (Https:www .masress.com). This due to low survival rate in our community compared to other. The mean age of study patient was (52.8) years. 26 male patients (61.9 %) while female patients was 16 (38.1 %). The case fatality rate was(50.6 %) which high compared to other studies, 30 % in Egypt (Https.www.e lfager.org), 11.5% in KSA (Https.www.alriyadh.com). It's due to multiple causes including late referral to HD and insufficient dialysis in presence of large number of patients

and a little HD unit in our province and few number of chair in these units. In compared to other countries KSA (213) HD unit and the total number of patient with CRF treated by HD are 15560 (Https.www.alsharq.net), But in Egypt(309) HD unit and the total number of patient treated by HD are 114287 (Https:www.tahrirnews.com). 9 of the patients have hepatitis C viruses in (10.8%) which lower than in other study 25_50 % of patients in Egypt on HD with HCV (Https.www.elfager.org) and in KSA was 11.54% (Https.www.alriyadh.com). This due to increasing incidence of hepatitis C in community especially among hemodialysis patients partly due to frequent blood transfusion, surgical procedure and low immunity in those patients. 10 of the patient (12%) undergoing renal transplant, while in other study 16% in KSA. this due to socio _ economic state and present of kidney donor program in these country. 27 of our patients have positive family history of CRF (32.5 %) mostly due to APKD. While 56 of our patients (67.5%) without family history. Regarding blood group 44 of our patients (53%) with blood group O as its major blood group worldwide (38% of population with blood group O while 34% are group A) (Https;www.ncbi.nlm.nih.gov.ABO blood group and renal disease). Regarding smoking history 12 of patients (14.5%) chronic smoker, 17 patients (20. 5 %) X _smoker at time of HD, 54 patients (65%) was nonsmoker. Social history of patients show 74 of them married (89.1%) while 9 of them single (10.9%) and below 25 years old. Regarding drug history 11 patients (13.2%) have drug allergy, 7 of them to penicillin group and 4 patients to sulfa group.

Conclussion

The incidences of CRF still high and progressively increase and the case fatality rate was very high, although renal transplant increases as successful treatment. Most of cases in middle age group, but hepatitis C is a growing problem between hemodialysis patients. APDK is major renal causes, lastly most of patients with blood group O.

Recommendation

Population with risk factor should be screened thoroughly and followed _ up periodically with appropriate tests. There is an urgent need for hemodialysis unit in each district in our province, although building of nephrology center remains the best option.Incidence of death among patients could be reduced by early detection of CRF patients and standard program of hemodialysis as soon as possible and education about renal transplant.

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