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CLINICAL CONSEQUENCES OF END STAGE RENAL DISEASE AND COMPETENCE OF ADULT PATIENTS ON MAINTENANCE HEMODIALYSIS

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Abstract:

Background & Aim: *End stage renal disease (ESRD) is an irreversible loss of kidney function caused by various risk factors and affected persons of lives mainly depending on the technology of renal replacement therapy (RRT) or renal transplantation (RT) to sustain the life. Aim of this study is to overview the clinical outcomes of ESRD and adequacy of maintenance hemodialysis among the patients.*

Place and Duration: *In the Nephrology Department of Nishtar Hospital Multan for one-year duration from March 2019 to March 2020.*

Materials & Methods: *Currently, there are sixty-two end stage renal disease patient's clinical data were collected and included in the study. For all patients, pre and post hemodialysis samples were collected and processed through biochemical and hematology auto analyzer. The hemodialysis modalities 4008 H/S and high-flux & low flux ultra-filter dialyzers had utilized to three dialysis sessions per week, 4 hrs per session for each individual. Blood flow rates differed from 150 to 350ml min1 depending on conditions and standard dialysate flow was 500ml/ min.*

Results: *Of total sixty-two patients, 51.62% females and 48.38% males with mean age of 47.76 (18-72) years; gradually increased at the ages of 55 to 72 years then adult age. Concerning overall risk factors in ESRD, 61.30% of hypertension as a leading risk factor followed by 21% NIDDM, 11.30% other kidney diseases and 6.40% cardiac related diseases. Although, there are others clinical signs such as hypothyroidisms; extra-pulmonary infection, retinitis pigmentosa and infertility have been diagnosed. In addition, nearly 33.87%% of HCV, 6.45% HBV and 3.22% of co-infection have been prevalence in ESRD hemodialysis population. Relating to hepatitis C, B and co-infection during dialysis exposure were 29.41%, 2.94% and 2.94% in that order. In relation to overall adequacy of maintenance hemodialysis in this study nearly 75.80% (≥ 1.3 to 2.5 Kt/V) and 24.20% (1.05 to 1.3 Kt/V) where been analyzed through Kt/V formula for wastage clearance.*

Conclusion: *The present study highlighted that the co morbidity of ESRD, current adequacy of adult maintenance hemodialysis, and suggesting to boost better by 90% (≥1.2Kt/V) of adequacy in all dialysis patients. In addition to that, exposure of hepatitis B and C virus during dialysis and advocating to implement current medical strategic to prevent ongoing clinical phenomenon within the patients.*

Keywords: *Maintenance hemodialysis, End Stage Renal Disease, Co-morbidity, GFR.*

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INTRODUCTION:

Chronic kidney disease (CKD) is characterized by irreversible loss of (short-term) renal function required for dialysis and kidney transplantation and end-of-life kidney disease (ESRD)[1-2]. The Glomerular filtration rate (GFR) is part of the discharge function and if the GFR deficiency is less than 60ml/min/1.73m2 is considered CKD, so it is not treated permanently. Even if the disease is curable, it must be a coincidence. Normal GFR in the adult population is almost 125 ml/min/1.73m2, but the individual ESRD is almost 30 mg/g); CKD progression in both types of ESRD5-throughd-radius diabetes (ER) in album history, cardiovascular and diabetic kidney disease, such as subsequent clinical risk factors. The main causes of the ESRD among ordinary people are; Diabetic nephropathy, glomeruli-nephritis, hypertensive nephropathy, congenital hereditary and polycystic diseases of the kidneys and others[3-4]. In addition, the highest albumin is significantly associated with the severity of hypertension and indication of insignificant lipids such as high total cholesterol, triglycerides, lipoprotein-a, decreased HDL-c levels and malformations of coagulation[5-6]. There are various parameters in the diagnosis of anemia and the treatment of patients with ESRD, such as target hemoglobin (11-12g/dl), ferritin (100-200ng/ml), transfer saturation (-20%), HYPO29pg)[7-8]. This study focuses primarily on the adequacy of hemodialysis of adult care as clinical outcomes of late kidney disease and the first scientific study among hemodialysis individuals, and recommended the introduction of these biomarkers in close function.

MATERIALS AND METHODS:

Patient and work plan: This study was held in the Nephrology Department of Nishtar Hospital Multan for one-year duration from March 2019 to March 2020. The study's topics include 62 ESRD patients aged 18-72 with a medical history were selected. All ESRD patients have been admitted to hospital under the guidance of nephrologists and epidemiologists due to hemodialysis and work in the facility. Patient samples were taken from the Nephrology department. The organization's ethics committee and an internal audit committee approved the procedure. Informed consent was obtained from individual patients. The data included morbidity and other clinical outcomes as criteria for including age, sex, ultrafiltration types, dry body weight, blood groups, hemodialysis doses, blood pressure, urea and creatinine (before and after hemodialysis), other data on labor and criteria for the exclusion of renal disease in the end.

Clinical analysis: Data's were collected from patient's data registry at the department of hemodialysis. Co morbidity of ESRD among hemodialysis patients were comprised anemia, hypertension, NIDDM (Non-insulin dependence diabetes mellitus), dilated cardiac myopathy (DCM), coronary artery diseases (CAD), renal atrophy, renal transplantation, diabetic nephropathy, myocardial infarction, polycystic kidney diseases, hypothyroidisms, HCV, HBV and hepatitis B&C virus co-infections were predicted meticulously through proper investigation. Biostatical analyses were performed by using Minitab (v16) and Microsoft ware Excel-2007.

Hemodialysis methods (4008S/H): All patients were treated with hemodialysis using an ultrafiltration membrane (GFS17, GFS14&GF6); In the permitted concentration of dialysis fluid, 4 hours for an attack and 3 times a week. Most patients had access to arteriovenous fistula (AVF) in hemodialysis in ESRD. The rate of blood flow varies from 150 to 350 ml, and the standard dialect ranges from 500ml/min-1. Heparin doses differed from patients and heparin doses, as well as priming, 2500, 5000, 7500 and 10000 iu. The minimum dose of dialysis was delivered in the Kt/V dialysis unit according to production rules. Sequential Cleaning Monitor (OCM) is an additional option for use in these systems mode. This option provides an estimated effective clearance resolution of urea (K), a dose of Kt/V dialysis and plasma sodium during dialysis. All patients were wanted with high/low flow ultrafiltration membranes. Dialysis was the same for all treatments and sodium 138mmol/l, potassium 2mmol/l, calcium1,75mmol/l, Magnesium 0.50mmol/l, 109.50mmol/l chloride, 3.0mmol/l acetate and bicarbonate 32mmol/l.

Laboratory clinical analysis: ESDRD patient's blood samples (5ml) were drawn correctly from overnight fasting pre-and post-maintenance hemodialysis in serum and plasma vacationer. This sample used for quantification of complete blood count profile, serum creatinine, blood urea nitrogen (before/after hemodialysis), sodium, potassium, calcium, phosphorus, total protein, and liver enzymes. Fasting blood glucose was measured within this sample for diabetic patients. All patients' samples were immediately centrifuged and stored at 2-8C° until analysis for the others biochemical parameters. All the biochemical and hematology parameters were measured by using AU480 and ACT5 Diff-Beckman clinical laboratory auto analyzer.

RESULTS:

Overall, 51.62% of the incidence of ESRD in women, compared to 48.38% in men and very low in young patients. Both sexes are steadily increasing between the ages of 55 and 72, and the

average age in the region increases to 47.76 (18-72 years). In the dialysis population, blood groups had 54.84% O (n-34%), 37.10% type A (n-23%), 4.84% type B (n-3) and 3.22% AB (n-2), respectively. Approximately 61.30% (n-38) of patients, such as patients planted in Figure 1, were clinically diagnosed with hypertension, 21% (n-13) of type 2 diabetes mellitus, Other kidney disease (1n kidney atrophy, 2n renal rejection, 20 polycystic cystic kidney disease and 2n glomeruli nephritis) and 6.40% were found in heart-related diseases (1 coronary artery disease, 2 dilated heart myopathy and 1n for myocardial infarction). In this population there are two other cases diagnosed with tuberculosis, a history of hypothyroidism, retinitis pigmentosa, infertility and rejection of the kidneys. In addition, 33.87% (n-21) of hepatitis C, 6.45% (n-4) hepatitis B and 3.22% were co-injectable (n-2) as infectious agents. In addition to general diastolic blood pressure for defined hypertension (>91-103 mmHg), it was initially 12.90% and posterior dialysis was 12.90% (91-103 mmHg). For this reason, cases of hypertension 1 and 2, other kidney diseases and heart-related diseases have been observed in type 2 diabetes. As shown in Table 1, static data on anemia were reported at hidden intervals of 9361 to 10 379% in cases of hypertension; 7.38- Type 2 diabetes 9.75; 7.536 - 12.864; related diseases; 7916 - 10 426 in other nephropathies; 9491 - 10,861 Common HCV and hepatitis B& C infections (5,404 -14,596, respectively). As a result, serum glucose (95% CI 91 495 - 370%) heart disease, as in a history of type 2 diabetes and the estimated size of a small sample. As for the density of urea and creatine before dialysis, estimates were reported as 95% CI:139.91- 160.97%; 9,761-11,239 in patients with hypertension; but after more dialysis levels 45.46-55.84; 3 714 - 4 574 respectively; levels of diabetes before type 2 dialysis and diabetes after dialysis 157.6 - 216.91; 7.51 - 13.90; 55.78 - 84.52; 2.98 - 4 007 respectively; heart disease levels before dialysis 172 522 - 263 473; Although the amount after dialysis 9,703 - 19,497 is 70,738 - 112.62; 3,611 - 8,539, respectively, and in other nephropathies the amount before dialysis ranges from 129.3 to 205.5; 7.85 -13.72 levels after dialysis 33.1 -102.9; 2621 - 6607, respectively. Like total protein, ALT and AST diseases fall within the normal limit. However, the alt was only high in co-infectiveness and other nephropathies in AST were very low. In addition, other important biomarkers, such as alkaline phosphates (ALPs), have increased and decreased throughout the ESRD population.

Table.1: Clinical outcomes of End Stage Renal Diseases and Biochemical's profiles with adequacy of maintenance hemodialysis

Biochemical's profiles - n62	Hypertension n38 (95% CI)	NIDDM n13 (95% CI)	Cardiac Diseases n4 (95% CI)	Other Nephropathy (95% CI) n7	HCV Infection (95% CI) n21	HBV infection (95% CI) n4
Blood Glucose (mg/dl)	108.80 134.24	156.70 285.50	91.495 370.00	92.33 132.53	106.11 134.85	127.00 129.00
Hemoglobulin (g/dl)	9.361 10.379	7.38 9.75	7.536 12.864	7.916 10.426	9.491 10.861	5.404 14.596
Urea (mg/dl) before dialysis	139.91 160.97	157.6 220.0	172.522 263.473	129.3 205.5	134.64 164.59	67.164 226.227
Urea(mg/dl) after dialysis	45.46 55.84	55.78 84.52	70.738 112.62	33.1 102.9	43.18 60.82	18.341 77.159
CREA (mg/dl) before dialysis	9.761 11.239	7.51 13.19	9.703 19.497	7.85 13.72	9.286 10.922	5.312 15.78
CREA (mg/dl) after dialysis	3.713 4.575	2.98 4.00	3.611 8.539	2.621 6.607	3.646 4.762	1.805 6.095
Sodium (Na) (mmol/l)	134.490 136.510	129.13 134.56	130.763 137.237	133.687 136.597	133.748 137.014	136.62 137.37
Potassium(K) (mmol/l)	4.773 5.167	4.445 5.447	4.696 6.354	4.354 5.830	4.89 5.29	2.845 7.135
Calcium (Ca) (mg/dl)	9.273 9.867	8.522 10.062	8.459 9.941	9.198 10.602	9.182 10.188	5.893 15.30
Phosphorus (mg/dl)	4.844 5.878	4.204 6.100	6.051 8.369	4.06 6.024	4.771 6.355	3.69 9.20
Total Proteins (g/dl)	7.118 7.466	6.851 7.655	6.824 7.685	6.504 7.666	7.139 7.651	4.099 11.01
ALT (U/L)	13.82 29.60	7.32 15.91	6.451 19.549	20.045 46.045	15.41 31.25	12.09 139.91
AST (U/L)	16.71 25.07	9.90 21.02	6.372 20.628	3.833 23.666	18.95 31.15	21.141 87.859
ALP (U/L)	98.80 254.00	83.0 161.1	42.620 421.88	113.533 269.533	138.7 418.5	27.327 207.17
Kt/V(≤1.4 to ≥1.5) %	31.60 68.40	69.30 30.70	75.00 25.00	42.90 57.10	Overall: 1.05-1.3 (24.20%) 1.3-2.4 (75.80%)	
URR ≤65 to ≥65% (Ureareduction radio)	44.80 55.20	69.30 30.70	100 (≤65%)	57.15 42.85	Overall: 40 to 64 (51.60%) 65 to 85(48.4 0%)	

DISCUSSION:

Recent kidney disease (ESRD) is common in Libya, as is usually the case in a developed country. To date, there are more than 40 care dialysis centers set up by the state health sector to continue this problem. Prevalence will increase by 8% per year from 2417 to 7667 (2009-2024) and will be higher than in the Middle East and North Africa (MENA) regions[9-10]. Overall clinical outcomes of ERE in Libya are 26.5% diabetic nephropathy, 21.2% glomerulonephritis, 14.6% hypertensive nephropathy, 12.3% congenital and hereditary diseases; 7.3% of unknown cases are 6.3% of polycystic kidney disease, 5% obstructive nephritis, 2.9% from others, 2% chronic pyelonephritis, 1.2% interstitial nephritis and 0.7%

autoimmune disease[11]. According to the estimated index of glomerular filtration after kidney disease, chronic kidney disease is classified according to the five stages recommended by the U.S. National Kidney Foundation for kidney disease (MDRD) for changes in diet. To classify patients with this term; 45-60ml/min/1.73m2 (3A) eGFR, eGFR between 30-45ml/min/1.73m2 (3B), eGFR between 15-30ml/min/1.73m2(evre4); GFR90ml/min/1.73m2 is considered stage 1&2. Hypertension causes an increase in the extracellular volume of renal failure duo and this is one of the main risk factors in the ESRD dialysis population. The National Kidney Disease Quality Initiative (NKF-K/DOQI) claims that 140-182 mmHg psPs before and after dialysis and 35.48% of psps should have posterior hemodialysis (140-188mmHg), but most of them are under the control of a management of anti-water drugs. Similarly, diastolic hypertension on the anterior and dialysis was 91-109 mmHg 91-103 mmHg[12]. Certainly, dry matter and ultrafiltration of waste play an important role in managing perfectly estimated hypertension. After hypertension and a complete increase in serum glucose in all patients with type 2 diabetes mellitus, people with type 2 diabetes are the second most common cause of late kidney disease. The increase in proteinuria in the urine is a sign of the disease, but not determinants of kidney disease[13-14]. More than 2,400 metabolic molecules, usually produced and released in plasma in normal metabolisms, and only 16 soluble resoles among them played an important role in the progressive stage of recent kidney disease. Therefore, tissue necrosis factor receptors (TNFR1&2) play an important role in predicting early loss of renal function without proteinuria in people with ESRD. A comprehensive study of clinical disorders in the ESRD is needed next year for early diagnosis and prevention of diseases. Blood group A, AB and Rh, b and these blood groups have an important association with type 2 diabetes and hypertension. In the current analysis, the incidence of this blood group is higher in patients with Libyan ESRD hemodialysis followed by groups A, B and EU. The majority of patients with serum creatine had values between 5-19mg/dl prior to dialysis and 1.8 to 8.5 mg/dl on dialysis. In addition, hemoglobin (Hb) levels range from 5.4 to 14.5 g/dl, and most were anemic even after treatment. There are many factors in dialysis pathways, such as blood, which is almost 2-3 grams per patient per year, recurrent blood for testing, vascular access procedures and anemia, such as genetic factors. Hemodialysis adequacy is called the total amount of toxin or elimination of valeting values, as well as phosphorus, but 4 hours of hemodialysis (3 times a week), always eliminating about 900 mg of phosphorus. Therefore, intervals in this analysis were estimated at 3.69-10.68 mg/dl during the working period and phosphorus elimination was required at each dialysis point. Large amounts of alkaline phosphatase in serum play an important role in patients on dialysis esrd care; The current study, especially in coronary artery calcification 30, was usually observed between 17.94-421.88 U/L and vascular calcification disorders had to be studied very closely. It is also necessary to examine in detail other aspects of dialysis adequacy in the coming years. 75.80% (1.3-2.5 Kt/V) were performed for the overall adequacy of waste disposal (urea/creatinine) and analyzed 24.20% (1.05to1.3 Kt/V). In adult hemodialysis, Kt/V is the target is 1.2 and this measurement is guided by KDOQI. So we need to update the best service in line with the approval of the global clinical community. Hepatitis B vaccine can control infection with hepatitis C virus through hemodialysis.

CONCLUSION:

Present study highlighted that the risk factors of ESRD and current study adequacy of adult maintenance hemodialysis. In addition, an improving over 90% of adequacy in dialysis patients is an important goal in this local ethnicity similarly to the population of chronic kidney diseases in developed countries and its co-morbidity literally differing from inhabitants and geography so this study were revealed both function with supervision and forwarding it to the national hemodialysis society in Libya to renew further scenario.

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