Mode of Presentation of Patients for the First Dialysis in the Haemodialysis Unit of East Medical Ward Mayo Hospital, Lahore.

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It is a prospective study of 50 patients carried out in the haemodialysis Unit of East Medical Ward, Mayo Hospital, Lahore from April 2000 to June 2000. Acute and Chronic renal failure no longer remains a dilemma to the treating physicians on account of emergence of novel techniques of management like dialysis and renal transplantation. Haemodialysis has revolutionized the science of Nephrology and the morbidity and the incidence of early mortality has significantly decreased during the last three decades in the patients of chronic and even acute renal failure. As no report on the mode of presentation of patients presenting for the first time for haemodialysis was available in Pakistan, we sought to determine the clinical and biochemical parameters responsible for bringing the patients for the first time to the dialysis unit of East Medical ward Mayo hospital, Lahore. All fifty patients between the age of 18-70 years who were suffering from acute or chronic renal failure and presented to the dialysis unit of East Medical ward Mayo hospital, Lahore for the first dialysis were included in the study and were evaluated for their modes of presentation. The syndrome of uraemia was diagnosed on the basis of clinical and biochemical criteria. Blood urea, serum creatinine, Arterial blood gases, serum electrolytes and Blood sugar was estimated in all cases under scrutiny. Abdominal ultrasound was done for the radiological evidence of bilateral renal parenchymal disease and all the cases were judged on the clinical criteria for evidence of uraemia before the commencement of haemodialysis while simultaneously taking in to account the reversible factors in selected cases.Among fifty patients under study uraemia was found in all the cases while hyperkalaemia and metabolic acidosis emerged as the most important biochemical factors with a percentage of 98%. Only 8% patients were suffering from acute renal failure while all other cases had Chronic renal failure. Pulmonary oedema with severe dyspnoea, chest pain due to uraemic pericarditis, oliguria and anuria were present as the mode of presentation in 74%, 50%, 46% and 28% respectively. Severe infections, coma, drowsiness and oedema and swelling of the body were found as presenting factors in 36%, 28%, 22% and 46% respectively. Only 24% patients presented with fits and convulsions. The results of this study revealed metabolic acidosis, hyperkalaemia, pulmonary oedema, pericarditis and oliguria as the most prevalent modes of presentation in the patients attending the dialysis unit of East Medical ward Mayo hospital, Lahore for their first dialysis session.
Key words: Haemodialysis, renal failure, uraemia, syndrome

Diabetic Nephropathy, Hypertension and drug induced renal disease has shown an alarming increase in incidence over last few decades. The emergence of haemodialysis as a treatment modality for the patients of acute and chronic renal failure prevents multiple catastrophic events and provides time to the patients for their preparation for renal transplantation which is the only ray of hope for the patients of chronic renal failure irrespective of the underlying aetiology. Haemodialysis is an exchange process that takes place between a patient's blood and an electrolyte solution similar to the blood, across a semipermeable membrane. This exchange removes waste products from the patient's blood and brings electrolyte balance to near normal. When this haemodialysis is repeated as a process regularly i.e thrice a week it can theoretically provide unlimited survival to the patients whose own kidneys lose their function. Primary kidney diseases i.e those involving the kidneys or urinary system are the most frequent causes of renal destruction accounting for more than 90% of patients treated by chronic haemodialysis. Glomerulonephritis represents only 40% of these primary diseases and its incidence is significantly higher in males than in females thus indicating rapid evolution of glomerular diseases in males. Females have a higher incidence of chronic pyelonephritis. Whatever is the underlying aetiology, chronic renal failure is the ultimate graveyard of all chronic renal diseases. Diabetes mellitus has emerged as a leading cause of nephropathy in Pakistan while Hypertension and Drug induced renal disease rank second as a factor leading to chronic Nephropathy.

Material and Methods

This study was conducted on fifty patients admitted to the Haemodialysis unit of East Medical Ward Mayo Hospital, Lahore. The aim of the study was to analyze the initial mode of presentation of the patients for the first dialysis. The parameters, which were studied, included clinical as well as biochemical factors. Pulmonary oedema characterized by severe dyspnoea, Uraemic Pericarditis, Drowsiness, Coma, Fits, Oliguria, Anuria, Oedema, Fever, Infections, Metabolic acidosis and Hyperkalaemia were the factors mainly studied in the cases under screening. Blood urea, Serum creatinine, Arterial blood gases, Serum electrolytes, Blood sugar, ECG, X-ray Chest, Urine complete examination and Abdominal ultrasound for the assessment of the radiological status of renal parenchyma

was done in all cases under study. Neurological examination of all the cases was carried out and the patients who were drowsy and unconscious were graded according to the standard scales and they were later on segregated. Other causes of metabolic encephalopathy were ruled out in these patients by clinical and laboratory screening. EEG & CT scanning was done in all those patients who had fits and convulsions and where the previous history of fits was available with a view to rule out epilepsy.

Results

Fifty patients admitted to the Haemodialysis unit of East Medical Ward, Mayo Hospital, Lahore for the first dialysis session were included in this study. 29 patients were male while 21 female patients were subjected to analysis for their mode of presentation for the first dialysis. Mean age of the patients was 45 years (Range 18-70 years). The data collected after statistical evaluation was thoroughly studied and the various modes of presentation of the patients for the first dialysis were determined. Chronic renal failure was the diagnosis in 46(92%) patients while only 4(8%) patients suffered from acute renal failure. Severe Uraemia was the most prevalent mode of presentation, which was present in 50(100%) patients. Hyperkalaemia and metabolic acidosis ranked second with their presence in 49(98%) patients. Pulmonary Oedema due to renal failure was a presenting feature in 37(74%) patients while the evidence of Uraemic Pericarditis was found in 25(50%) patients. 23(46%) patients presented for first dialysis with Oliguria and 14(28%) cases had anuria. High grade fever and severe infections including urinary tract, chest and other infections brought 18(36%) patients to the dialysis unit for the first time.14(28%) cases were in the state of coma due to uraemic encephalopathy while 11(22%) were drowsy. Generalized swelling of the body i.e Oedema was a presenting factor in 23(46%) patients and among all the cases under study only 12(24%) suffered from convulsions and fits at their first entry in to the dialysis unit of East Medical ward. (Table-I) with (Fig.1& Fig-2).

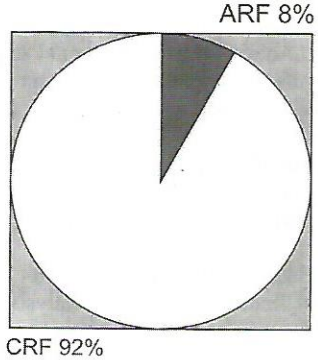

Fig. 1

Table 1.

Variable	%age	Variable	%age
Uremia	100	Fits	24
Pulmonary Oedema	74	Oedema	46
Pericarditis	50	Coma	28
Metabolic Acidosis	98	Drowsy	22
Hyperkalemia	98	Oliguria	46
Infection	36	Anuria	28

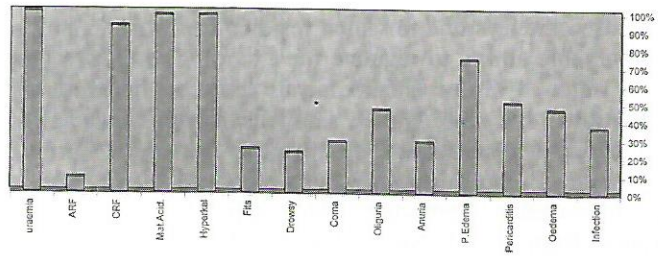

Fig. 2

Discussion

With the advent of the sophisticated procedures like haemodialysis and large numbers of dialysis centres in almost all the big cities and even suburban areas the syndrome of uraemia which used to be a killer of patients at an early stage is now amenable to treatment globally including developing countries like Pakistan. This study aimed at the statistical analysis of the clinical and biochemical modes of presentation of the patients requiring haemodialysis for the first time. Dialysis can replace only excretory functions of the kidneys while endocrine and metabolic functions are beyond the scope of haemodialysis for which a functioning transplanted kidney is essential. Renal failure whether acute or chronic results in accumulation of many toxic products in the body which include urea, creatinine and other low molecular weight metabolites of nitrogen e.g Guanidine compounds, Guanidosuccinic acid, Methylguanidine, Guanidopropionic acid, Phenolic compounds, Aliphatic amines, Myoinositol, Ammonia and many other toxins which have been identified in the plasma of uraemic patients. These toxins are found to have toxic effects on platelets & their functions, neurones, blood cells, lungs and musculoskeletal system of the body. The urgent removal of these products is therefore essential because the morbidity and mortality of these patients is very high if appropriate dialysis

treatment is not instituted in time. Uraemic polyneuritis may persist despite effective treatment with haemodialysis while significant improvement occurs in patients of polyneuritis following renal transplantation.[1] Defective catabolism of hormones by the diseased kidneys results in elevation of the plasma levels of these hormones i.e Parathyroid hormone, Glucagon and Prolactin[2] Hydroxylation of 25 OH vitamin D3 to its active form 1,25(OH)2 vitamin D3 which stimulates intestinal absorption of calcium and phosphorus is needed for skeletal mineralization[3] Muscles are damaged by the production of toxic nitrogen waste products and there is an undesirable reduction in muscle mass of the uraemic patients resulting in uraemic myopathy[4]. Nature has provided sufficient reserve of nephrons even in the diseased kidneys due to which residual nephrons exhibit a remarkable ability to regulate the excretion of electrolytes and water[5]. Chronic haemodialysis replaces the excretory functions and the water and electrolyte homeostasis functions performed by the healthy kidney. There is continuous exchange of water and solutes across a semipermeable membrane which separates the patient,s blood from the dialysate fluid. A hydrostatic pressure gradient may be created between the blood and the dialysate to remove by ultrafiltration the excess water and salt accumulated between the dialysis sessions[6] Dialyzer is the device which is used for the process of haemodialysis. Various types of Dialyzers include Coil, Parallel plate and Hollow Fiber Dialyzers. The semipermeable membranes used include Cellulose acetate or Cuprophane membranes besides many other materials occasionally used under specific circumstances. A double lumen catheter is inserted in to the subclavian vein as an emergency procedure while Arteriovenous fstula is required for long term dialysis. Such distal shunts usually have a flow rate of 250mls/minute and moderate flow. They are well tolerated by the heart but if the flow rate is very high it affects local or cardiac haemodynamics. Vascular steal syndrome is a local effect and is reflected clinically by cramps and painful paraesthesias in the distal part of the limbs especially while making an effort[7] The effects on the heart only manifest in the case of internal Arteriovenous fistula with excessive development or arteriovenous grafts inserted on proximal vessels where the blood flow may be 1-3 litres per minute[8] The minimum weekly dialysis time must be calculated in better interest of the patient[9] The patients body weight which determines the urea pool and the residual diuresis are the factors which play a vital role in deciding the number of dialysis sessions per week[10] The residual diuresis plays a vital role in the elimination of toxic materials[11] The vascular access may develop infection which may be in the form of septicaemia or infective endocarditis whether this is a shunt, fistula or a graft[12] Patients may present to the dialysis unit for the first time with infections the incidence of which keeps on increasing due to leucocyte sequestration on the dialysis membrane[13] This sequestration also occurs in the pulmonary tissues resulting from complement activation by the cellophane membrane[14]. Bleeding time is prolonged in end stage renal insufficiency due to altered platelet function[15] These changes are related to the dialyzable toxins such as guanidosuccinic acid[16] or phenols[17] There are multiple complications which are related directly to the process of haemodialysis. Uraemic encephalopathy may be the first complaint of the patient which suggests a responsibility of low molecular weight toxins, probably organic acids[18] Electroencephalographic (EEG) tracings are therefore essential before commencing haemodialysis so that the efficacy of the dialysis can be evaluated[19] Motor disorders, Uraemic Polyneuritis, Diminished tendon reflexes and autonomic neuropathy are all the features of the syndrome of Uraemia[20] Patients who are hypertensive on first dialysis and who remain hypertensive after six months of dialysis suffer from Cerebrovascular Accident[21]. This incidence is much higher when the age of the patient is above fifty years[22]. The mode of presentation of the patients thus shows great diversity and needs adequate evaluation by the Nephrologists all over the world.

Conclusion

The mode of clinical and biochemical presentation of the patients vary and the different cases under study revealed multiple factors leading to the syndrome of uraemia. We conclude that Hyperkalaemia, Metabolic acidosis, Pulmonary Oedema, Pericarditis, Generalized oedema, Fits, Infections and altered states of consciousness are the most prevalent modes of presentation of the patients presenting for the first session of haemodialysis.

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