

Starting chronic dialysis treatment in an emergency. What morbidity and mortality?

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ABSTRACT

Objective: To evaluate the morbidity and mortality of patients with end stage renal disease (ESRD) initiating chronic dialysis treatment in an emergency.

Population and methods: From the register of nephrology emergencies were included in the study 230 patients who started first dialysis treatment for ESRD emergency and that during the study period between January 2010 and December 2013. clinical and biological characteristics and the initial outcome of these patients were studied.

Results: During these 4 years , 510 patients were treated in emergency hemodialysis including 230 patients 45 % had ESRD , never initiated dialysis . A very rapid increase in the frequency of incident cases was observed as 9 % of cases were recorded in 2010 , 16 % in 2011 , 33 % in 2012 and 42 % in 2013. 43.4 % of cases were seen during the 3 months summer. The average age of our patients was 48 + / - 18 years with a slight male predominance of 54.3 % . Diabetes (29.6%) , hypertension (23.5%) and heart disease (16.5%) were most associated with ESRD comorbidities. The IRC was known and followed prior to admission to the emergency room only in 30.1% ; among these patients followed , 11% of them have been sent to a nephrologist. The reason for admission to the emergency room was dominated by dyspnea (25%) , vomiting (22 %) and impaired consciousness (14.3 %). Biologically , the mean creatinine was 154.40 + / -91 mg / l with a mean creatinine clearance of 4.7 + / -2.9 ml/min/1.73m² . Hyponatremia was prevalent in 89.3 % and symptomatic deep and in 12.3%. Greater than 6.5 mmol severe hyperkalemia / l was observed in 17.32 % of patients. Deep acidosis least 10 mmol / l was seen in 58 % . Anemia was almost constant with an average of 6.9 mg hemoglobin / dl and 44.2 % had urgent transfusion requirements . Acute pancreatitis was associated with ESRD in 13 % . Clinical and biological infectious syndrome was noted in 29.5 % of cases. 15.6% of patients required an initial hospitalization in intensive care (SSI) . Indications for taking emergency dialysis were represented by threatening hyperkalemia (23.4%), a major uremia (22.6%) , acute edema of the lung (17.4 %). The incision was a temporary catheter in 224 patients (97.4 %). During the first hemodialysis , 22.2% of patients had hypotension, 16 patients or 7% a cardiac arrest . A death rate of 18.3% or 42 patients was recorded during the first hospitalization. Predictors of mortality found in the bivariate study are: disorders of consciousness (p < 0.0001) , dyspnea (0.004) , the least severe anemia 7g/dl (p : 0.005) , infection (P: 0.0012) , acidosis (p < 0.0001) , a higher rate of urea has 3g / l and hospitalization for SSI (p : 0.005). The multivariate analysis retained all these factors as independent mortality factors except dyspnea .

Discussion and conclusion: The start of dialysis emergency is associated with adverse outcomes in terms of morbidity and mortality. It results from a beam of medical causes , but also socio - economic . There is a great lack of screening and monitoring of chronic kidney disease and late referral to a nephrologist .

Keywords : Emergencies – Mortality - *ESRD*

INTRODUCTION

The upward progression of the prevalence of end stage renal disease (ESRD) in our population and its socio -economic cost pose increasingly problematic its management . The extracorporeal blood purification (ERA) including hemodialysis has transformed the management and prognosis of patients with ESRD . The initiation of hemodialysis is done in the majority of patients with CKD is already detected and followed, after a preparation phase and that in the preterminally by psychological preparation , creating an incision , vaccination against hepatitis B, correction of anomalies related to IRC ... etc, but in some cases , especially in our context, of ESRD dialysis treatment is started in an emergency context . The aim of our study was to describe the characteristics and prognosis in a population of patients with renal failure arriving at the terminal stage of the disease was not programmed starting renal replacement therapy but in an emergency situation to the appearance of a general metabolic complication or

MATERIAL AND METHODS

This is a retrospective conducted between January 2010 and December 2013. Were included in the study , patients who consulted the emergency CHU Mohammed VI, Marrakech and whose clinical and paraclinical reveal ESRD requiring initiation emergency hemodialysis before the presence of a medical emergency. Patients taking urgent dialysis acute renal failure or acute decompensation of IRC are excluded from the study as well as patients with chronic and terminal IR were not sufficiently explored. The IRCT is defined by a glomerular filtration rate estimated by the MDRD formula under 15 ml/min/1,73m²

Fate and mortality of the patients were evaluated in the short term during the first hospitalization for initiation of dialysis .

For the collection of clinical, biological and therapeutic data , we are based on a review of medical records, registry care nephrology and notebooks monitoring dialysis.

Statistical analyzes were performed with SPSS for Windows. Qualitative variables are expressed as % and qualitative variables expressed as mean + / - standard deviation.

RESULT AND DISCUSSION

During the four years between 2010 and 2013 , there were 230 cases of initiation of chronic dialysis treatment in an emergency, which represents 45% of all activity acute dialysis in our training is 510 cases with 226 cases of acute hemodialysis for acute renal failure (ARF) or acute decompensation CKD and 50 patients were already on chronic hemodialysis (table 1).

Table 1: Distribution of cases in emergency hemodialysis

	Acute renal failure	ESRD initiation emergency hemodialysis	chronic hemodialysis	Other (hypercalcemia, intoxication)	Total
Number	226	230	50	4	510
Percentage %	44,3	45	9,8	0,7	100

IRA: acute renal failure HD: Hémodilysis

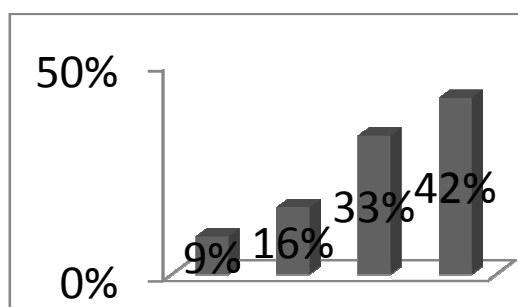
ESRD: Chronic Renal Failure terminal

CKD was not known at the time of discovery and the emergency department visit in 69.1% of patients initiated emergency chronic dialysis (Table 2), whereas it was previously known in 71 patients (30.9%) of which 56 patients were diabetics. These patients were followed by endocrinologists, general practitioners and cardiologists in most cases and only 11% of patients were referred tracked and monitored by a nephrologist. At the last assessment of renal function, 60.5% was already in terminal stage and not yet introduced to the ERA and 39.5% had stage IV chronic kidney disease. The average time between the last control creatinine and emergency admission was 13 months.

Table 2: The circumstances of discovery ESRD

	ESRD discovered on admission	CKD known and followed	CKD known no followed
Number	159	38	33
Percentage %	69,1	16,5	14,3

The evolution of incident cases of ESRD taken into emergency hemodialysis is growing, there were 9% of cases in 2010, 16% in 2011, 33% in 2012 and 42% in 2013 (Figure 1).

**Figure 1:** Evolution of incident cases (2010-2013)

There is a great disparity in frequency during the year (4 years old) with a maximum frequency of incident cases during the 3 summer months between June and September as shown in the following figure (Figure 2). A second peak frequency is recorded in October to coincide with the Feast of Sacrifice.

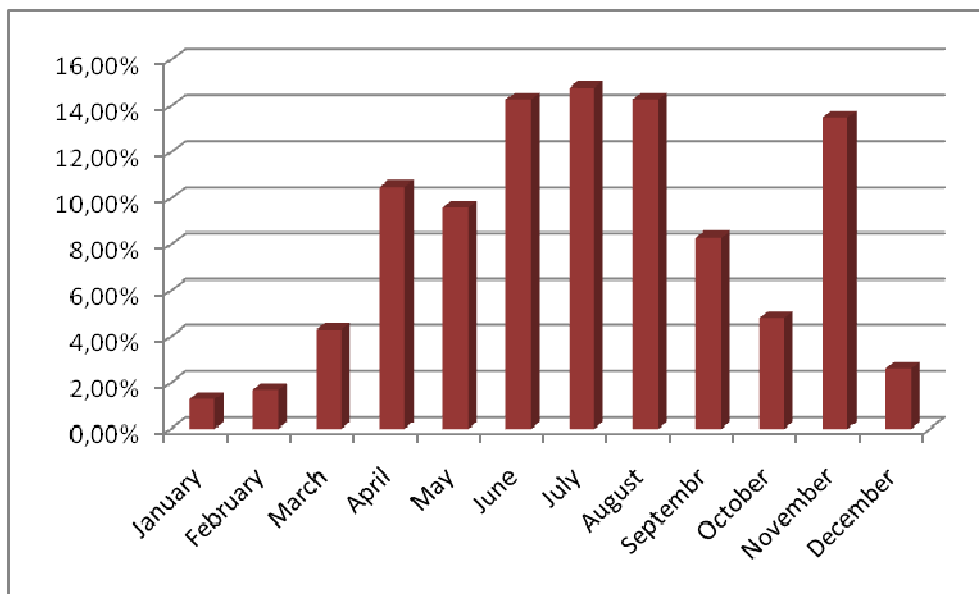


Figure 2: Evolution of the cases recorded during the year.

The average age of our patients was 48 +/- 18 years, the age group between 16 and 40 years accounted for 37.8% patients. A slight male predominance of 54.3% is noted.

The main comorbidities associated when visiting the emergency are:

- Diabetes in 68 patients or 29.9%, type 2 diabetes accounted for 70.4% of cases. The duration of diabetes at the time of initiation of dialysis was 13.7 +/- 5.7 years. 56 patients (82.3%) were followed, most often by an endocrinologist or general practitioner. The IRC was discovered at the time of initiation of dialysis in 51.4% of patients followed without evaluation or nephrology before and only 19.1% of diabetic patients have already seen consulting a nephrologist
- Hypertension : 23.5% (54) patients entaient known hypertensive, 87% were under antihypertensive treatment regimen and 67.3% of cases had a medical follow-up. Renal function was assessed during follow-up in a minority of patients (24.8%). Among hypertensive patients known IRC, the nephrological follow-up was assured that in 16% of cases.
- Heart disease : 42 patients (18.2%) had heart failure of different stages 1 to 4 Coronary disease is recorded in 24 patients (10.4%). Arterial disease of the lower limbs in 13 patients known (5.6%) and a previous history of stroke in 9 patients (3.9%).

Diabetic and vascular nephropathy represented the most frequent initial nephropathy, The following fig shows the distribution of cases according to the causal nephropathy (Figure 3).

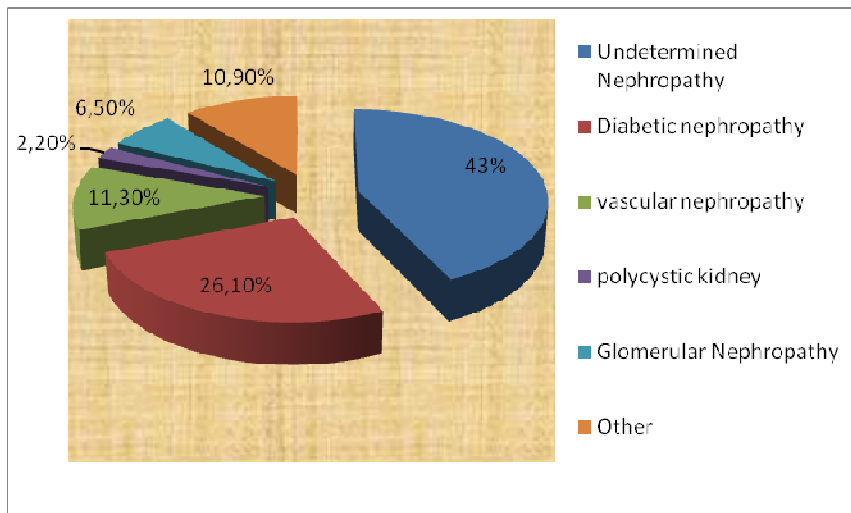


Figure 3 : Néphropathies causales

The reason for admission to the emergency room was represented mainly by dyspnea in 25% cases, digestive disorders (24.3%) impairment of the general condition (19.1%) and impaired consciousness (23, 5%) (Table 3)

Table 3: Pattern of admission to the emergency

The reason for admission	Effective	Percentage
dyspnea	58	25,2%
Vomiting	56	24,3
Neurological disorders	54	23,5%
Asthenia , anorexia	26	11,3%
Haematemesis	11	4,7%
Epistaxis	7	3%
Other	18	7,8%

The average time between onset of symptoms and admission to the emergency room was 17.7 +/- 3 days.

Dyspnea was multifactorial in most patients, was most associated dyspnea were factors : anemia (92 % of patients dyspnoea) , acidosis (86%), infectious pneumonia (66%) , excessive sodium hydro (12 %) and heart failure (11.4 %) .

The deterioration of the general condition defined by asthenia , anorexia or weight loss was almost constant , found in 93.8% of patients in the entrance examination . It was the first sign to appear in more than 60 % of patients.

Disorders of consciousness were very common in our series , observed in 54 patients or 23.5 % , it is most often mild confusion with a Glasgow Score average 12 /15, the brain scan was normal in 94% of these patients. These disorders of consciousness were associated in 41.6% a major uremia, in 22.3% to 11.3% and hyponatremia in severe sepsis. The confusion was due to ischemic stroke consists in 4 cases and 2 cases of meningoencephalitis.

Digestive disorders were also common in our series: nausea and vomiting have been described in the initial examination in 62 % of patients , 24.6 % were indicative of the ESRD . The epigastric pain are described in 34.7 % of cases compared with acute pancreatitis in the majority of cases (30 cases). Only 13 patients have benefited a gastroscopy during the initial hospitalization , 11 patients it showed gastritis and in 2 cases of bulbar ulcer .

Blood pressure : 72.3 % of patients had normal blood pressure at admission and 10.8 % were hypertensive emergency. The median PAS was 120 + / -66 mmg and diastolic 65 + / - 36 mmg . Diuresis, it was preserved in most patients (75.7 %). Biological parameters to baseline are summarized in Table 3.

Infectious syndrome was common in our series: leukocytosis with positive CRP in were recorded in 48.9% of patients. The give and clinical assessment paralinique have determined the nature of the infectious outbreak in 68.3 % . Pulmonary infection was the most common etiology in 77 % of cases.

The technique of renal replacement therapy was intermittent conventional hemodialysis in all patients . Indications for taking emergency dialysis were represented by threatening hyperkalemia (23.4%), a major uremia (22.6%) , acute edema of the lung (17.4%) , severe acidosis the profound anemia and severe resistant hypertension , often these indications were associated in most patients. 15.6% were initially admitted to the ISS . The incision was a temporary hemodialysis catheter in most patients, only 6 patients , initiation was done on arterio -venous fistula. 44.2 % had a transfusion during the first hemodialysis for severe anemia .

During the first sessions of hemodialysis, 16 patients were present cardiopulmonary arrest. Hypotension was a common complication described

Table 3: biological parameters

Biological parameter	Value
Creatinine (moyenne)	154 +/- 91 mg/l
GFR (ml/min/1,73m2)	
Mean	4,7+-2,9 ml/min
	66,4%
<5	27,3 %
5-10	6,3%
10-15	
Urea (g/l)	
Mean	4,34+/-1,3
Natremia	
Mean	127+/-19
35-145 mmol/l	24,6%
125-135 mmol/l	52,7%
< 125 mmol/l	21,5%
Kaliemia	
Mean	5,4+/-1,19
normale	34,9%
5-6	33,4%
6-7	18%
> 7	13,1%
bicarbonates	

Median 22 - 10mmol/l HCO3- < 10 mmol/l	10,6+/-5,6 48,2% 51,8%
Calcemia Median (mg/l) 85-75 < 75	73,7+/-13,6 34,7% 49,4%
Phosphoremia mg/l Median	89,10 mg/l
PTH Median ug/ml > 585 ui (%)	520+/-110 11
Hemoglobin Median mg/dl < 5 5-10 > 10	6,9 +/- 1,9 50,8% 46,8 % 3,4%
Leucocytes > 10 000 elm/mm3	32,6%
CPR Positive > 10 mg/l	29,9%
Lipase > 120 ui/l	13%

in 51 patients (22.2%) and 11 patients (4.9%) had seizures.

A death rate of 18.3% (42 patients) was noted during hospitalization for initiation of dialysis, 14 patients had a cardiocirculoaire stop during the first dialysis session. Predictors of mortality are summarized in Table 4.

variable	Death yes n = 42		Death no N= 188		p
	N	%	N	%	
Diabetes	15	35	53	28	NS
Mean age (year)	52	-	46	-	NS
Period of consult (months)	15	-	13	-	NS
Neurological disorders	23	54,8	31	16,5	<0,0001
Dyspnea	23	54,8	59	31,9	0,004
Departement					
ICU	21	51,2	14	7,7	<0,0001
Nephrology	18	43,9	105	57,4	NS
Transfusion	26	65	62	39	0,03
Cardiac arrest	15	35,7	1	0,53	<0,0001
Infection	20	55,6	48	32,9	0,012
Biologie					
Creratinine>100mg/l	33	78,6	114	62,6	NS
GFR < 7 ml/min	36	85,7	139	76,8	NS
Urea> 3g/L	28	68,3	80	44	0,005
Na<125mmol/l	9	25,7	27	17,9	NS
K > 6mmol/l	17	34,2	44	30,3	NS

Acidosis <10 mmol/l	34	81	61	32,6	<0,0001
Calcemia <75mg/l	27	64,3	85	45,2	NS
Hemoglobin < 7g/dl	27	64,3	80	42,5	0,01
Lipase > > 120 ui/l	8	19,4	22	11,7	NS

DISCUSSION

Our study raises the characteristics and prognosis in a population of patients with renal failure arriving at the terminal stage of the disease was not programmed starting renal replacement therapy but in an emergency situation before the onset of metabolic or systemic complications. There was no local statistics on the number of patients initiating ERA so programmed to know the percentage of patients who start ERA in emergency and scheduled but the high incidence of ESRD patients who discover their emergency and others that followed will lead to irregular low prevalence of patients who start programmatically. In the series reported (1,2), the prevalence of ESRD initiated emergency dialysis around 30 % of all patients insiders ERA . We note in our series , a lack of screening and monitoring of chronic kidney disease and late referral to a nephrologist especially for diabetics and hypertensive patients followed by their general practitioners , endocrinologists and cardiologists, since the majority of patients were followed no assessment of renal function before and a small percentage of these patients are referred to a nephrologist and this explains the low percentage of known IRC prepared for replacement therapy including making arteriovenous fistula patients. The prevalence of registered cases are increasing every year with almost a doubling of frequency every year especially during the first 3 years of the study , 9% of registered cases in 2010 , 16 % in 2011 , 33 % in 2012 and 42% in 2013 explained in part by the increase in the prevalence of CKD and secondly by easier for laboratory tests and nephrologists access . Describes a high frequency of incidents during the hot season between June and August compared to other seasons of the year ; This shows the role of dehydration and infection in the IRCT decompensation and the onset of complications .

Compared with data from the literature describes a population of pus young patients with a mean age of 48 years and an age range 40 months which is 38% of patients. Male predominance is consistent with literature data .

Diabetes, hypertension and heart disease are among us as in other series , the main comorbid conditions associated with ESRD and their diabetic nephropathy and vascular causal are the two main causal nephropathy . Late diagnosis of IRC explains the high incidence of indeterminate character of the initial nephropathy in our patients .

Acute dyspnea was the symptom of consultation with the most frequent emergencies, it was multifactorial in most patients report especially with acidosis , anemia and pneumonia than overload and heart failure. The deterioration of the general condition was present in almost all patients represented essentially by weight loss, asthenia and anorexia experienced by most patients as the first sign of the disease. Vomiting is also much symptoms since the IRCT . Other digestive disorders noted in our series were epigastric pain (24.7 %) and haematemesis (3.9 %). These digestive disorders are related to uremia and gastritis but our series that goes pancreatitis acute acalculous probably of metabolic origin was responsible for a large number of digestive disorders in patients with ESRD . The frequency of these digestive disorders including vomiting will explain the prevalence of metabolic complications. Disorders of consciousness were the reason for admission to the emergency room in 54 patients or 23.5 % , most of the time it was mild confusion related hyponatraemia or uremic encephalopathy but in 11.3 % of patients confused she was a secondary or associated sepsis and in 6 cases it was secondary to hemorrhagic stroke or meningoencephalitis . The frequency of vomiting and conservation of diuresis explain the trend with normal blood pressure.

The biological data are analyzed and comparison with most series in the literature , there is a lower residual renal function with a glomerular filtration rate estimated by the MDRD formula below: 66.4% of patients had a GFR 5ml/min months , we recall that patients with CKD is decompensated by dehydration, the GFR is calculated after correction of decompensation after stabilization of renal function and patients with ARF on CKD on dialysis or not are excluded from the study except for patients who remain dependent on dialysis with a GFR of 15ml/min months . A higher level of urea in our series can be explained by the high frequency of dehydration associated with vomiting and anorexia. The severity of uremia is represented by the uremic encephalopathy , common in our study and responsible for a large portion of disorders of consciousness. The threatening hyperkalemia is not common there against by the acidosis and hypocalcemia are deeper in our series compared to the literature and anemia which was very frequent and severe in the majority of patients 44.2 % required urgent transfusion and only 10 patients had a correct hemoglobin including 4 cases of polycystic kidney disease and 6 cases were treated with erythropoietin. Support late CKD and the absence or poor preparation of the patient during the pre-terminal explains these disorders including anemia and phosphate disorders that require testing and replacement therapy before the terminal stage. Acute pancreatitis was associated with ESRD in 13 % of patients. It has retained the diagnosis of PA in a patient if the patient is symptomatic and that the rate of lipase is greater than 3 times normal to be uniform with the studies done in this direction (4,5) which emphasize as elevated lipase months 3 times normal may be in patients with renal disease without translation. All late pick IRCT and state clinico- biologique highly weathered patients starting dialysis urgently explain the high mortality rate of 18% in knowing that just took the short-term mortality in time of initiation of dialysis and was reported to be a long-term patients because their care and monitoring was not carried out by our center.

A patient supported a late estimated mortality risk increased by more than 40% compared to that followed long [9] . The adverse consequences of late referral to a nephrologist were , for the first time , highlighted by Jungers in 1993 [1] . They were confirmed by multicenter studies internationally [4-5] . We analyzed predictors of mortality in our series , we find that : a high level of urea , acidosis and anemia are correlated to increased mortality and the initial hyperkalemia, the glomerular filtration rate and other biological disturbances are not associated to mortality.

CONCLUSION

Starting dialysis in emergency is associated with adverse outcomes in terms of morbidity and mortality. It results from a beam of medical causes, but also socio-economic. We noted a lack of screening and monitoring of chronic kidney disease and late referral to a nephrologist resulting in a large number of patients who initiate hemodialysis emergency with a significant mortality.

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