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STUDY OF CLINICAL PROFILE OF ACUTE RENAL FAILURE IN GERIATRIC PATIENTS

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Abstract
Background: The elderly is particularly vulnerable for renal insults. They often have comorbid conditions such as arterial hypertension, chronic heart failure or diabetes mellitus facilitating renal damage. This study is about the various patterns of renal diseases among elderly patients and various etiological factors causing them. **Materials and Methods:** The present study was conducted on 100 patients at Department of General Medicine, B.J. Medical College and Civil Hospital, Ahmedabad from June 2018 to November 2020. Detailed history was taken and physical examination was done according to specially designed Performa. Hematological investigations like Complete blood count, routine urine examination, peripheral smear, blood glucose, INR, serum urea and serum creatinine, serum electrolytes, SGPT, serum bilirubin, arterial blood gas analysis, serum calcium, phosphate and uric acid were done. **Result:** In the Present Study nearly 62% of the study subjects were aged between 65 to 70 years, 27% of them were between 71 to 75 years, 9% of them were between 76 to 80 years and 2% were aged more than 80 years. In the present study, 55% of the patients had no co-morbidities whereas 16 % of them had Diabetes Mellitus and Hypertension, Cirrhosis of Liver in 6 %, HIV in 3 % and Ischemic heart Disease in 2 %. In the present study among those who have expired 9 out of 10 people were on Dialysis i.e 90 % of the subjects who got expired were on Dialysis and only 1 subjects i.e 10 % of them were on Conservative Treatment. Among the 10 patients who expired, 9 patients were suffering from co morbidities like DM, HTN, CCF, Cirrhosis etc, and 1 patient was without co-morbidity. **Conclusion:** The study shows that older age group patients with pre-existing medical illness have a higher mortality and hence should be managed intensively.

INTRODUCTION

One of the most striking changes in the demography of the world has been the increased proportion of elderly individuals in the population, who are considered as the "Geriatric" individuals of age 65 years and above.[1]

Ageing can be described from a physiologic standpoint, as a progressive constriction of the homeostatic reserve of every organ system. This decline referred to as homeostasis is evident by the third decade and is then gradually progressive.

Alterations in kidney function occur with advancement of age. Increased susceptibility to systemic diseases and exposure to multiple drugs makes the elderly people more likely to kidney diseases.

Acute renal failure (ARF) is a syndrome characterized by rapid (hours to weeks) decline in glomerular filtration rate (GFR) and retention of nitrogenous waste products such as blood urea nitrogen (BUN) and creatinine and perturbation of extra cellular fluid volume and electrolyte and acid base homeostasis.[2,3]

ARF is responsible for major morbidity and mortality of hospitalized patients because of serious nature of the underlying illness and the high incidence of complications. ARF is usually asymptomatic and diagnosed when biochemical monitoring of hospitalized patients reveal a recent increase in blood urea and creatinine concentration.[4,5]

It complicates 5 to 7% of acute care hospital admissions and 30% of intensive care unit admissions. In India, AKI constitutes 1.5% of hospital admission, of which 60% are due to medical causes diarrhoeal illness, sepsis, infectious diseases, hypertension, diabetes mellitus, snake bite, cardiac failure, cirrhosis, drugs, auto-immune diseases.[6,7]

The most common causes of ARF are; volume depletion, hypotension, aminoglycoside antibiotics and radiocontrast agents. Major surgery is also an important cause of ARF. Advanced age, liver

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diseases, underlying renal insufficiency and diabetes have been implicated as risk factors for the development of ARF.[8-10]

The elderly is particularly vulnerable for renal insults. They often have comorbid conditions such as arterial hypertension, chronic heart failure or diabetes mellitus facilitating renal damage. The average use of medication potentially endangering kidney function rises with age. At the same time renal functional reserve declines. It is therefore not surprising that epidemiological studies indicate an age-dependent increase of the risk to acquire AKI.[11,12]

This study is about the various patterns of renal diseases among elderly patients and various etiological factors causing them.

MATERIALS AND METHODS

The present study was conducted on 100 patients at Department of General Medicne, B.J. Medical College and Civil Hospital, Ahmedabad from June 2018 to November 2020. All the Patients with Kidney Disorder admitted in the hospital which fulfilled the inclusion and exclusion criteria were taken.

Inclusion Criteria
- Age >65 years
- All patients presenting with Acute Renal Failure as per KDIGO2012 criteria.

Exclusion Criteria
- Age <65 years
- Patients who give negative consent for the study
- Patients with known case of chronic kidney disease or acute renal failure on background of chronic kidney disease.

Detailed history was taken and physical examination was done according to specially designed Performa. Hematological investigations like Complete blood count, routine urine examination, peripheral smear, blood glucose, INR, serum urea and serum creatinine, serum electrolytes, SGPT, serum bilirubin, arterial blood gas analysis, serum calcium, phosphate and uric acid were done. The results were registered into a computerized data sheet. Special Investigations like Electrocardiogram, Chest X-Ray, 2 D Echocardiography, Abdominal Ultrasound, NCCT KUB were done as per the requirement. The patients admitted with the diagnosis of Acute Kidney Injury in Civil hospital were enrolled in the study as per the inclusion and exclusion criteria. Informed consent was taken from patient/relative. Their history and relevant clinical, biochemical and radiological data were entered systematically in a case collection proforma. The patients were observed for the outcome during the hospital stay.

Study ended when sample size of 100 was reached. All patients were given treatment as per standard guidelines whichever required, dialysis or ventilatory support.

Statistical Analysis
The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

RESULTS

In the Present Study nearly 62% of the study subjects were aged between 65 to 70 years, 27% of them were between 71 to 75 years,9% of them were between 76 to 80 years and 2% were aged more than 80 years. 34% of the study subjects were Female and 66 % of them were Male.

In the Present study based on the Patients Clinical presentation Tachycardia was seen in 72%, Fever in 25%, Vomiting in 10%, diarrhea in 37%, Hypotension in 39%, Lung Crepitation's in 24%, Cough in 12%, Burning Micturition in 12 %, oliguria in 63%, Edema in 16 %, Altered Sensorium in 7 %, Abdominal Pain in 15% and Jaundice in 8 %. Oliguria was the most common symptom among the study subjects, Tachycardia was the most common sign among 72% study subjects.

In the present study, 55% of the patients had no co-morbidities whereas 16 % of them had Diabetes Mellitus and Hypertension, Cirrhosis of Liver in 6 %, HIV in 3 % and ischemic heart disease in 2%. The presence of Co-morbidities among the study group who are already aged more than 65 years where age itself acts as a risk factor for Acute Renal Failure. [Table 1]

In the present study the causes of AKI were classified based on Pre-Renal /Intrinsic and Post Renal Aki based on the Etiology. The subjects with Pre-Renal AKI were 94% and Subjects Post Renal AKI was 6 %. [Table 2]

In the present study among the subjects Acute Gastroenteritis was the most common cause of AKI in nearly 38 % of the subjects followed by Septicemia in 21% of the study subjects. CCF was seen in 11%, HRS was seen in 6 %, Obstructive cause for AKI was seen in 6 %.

In the Present study on comparing various etiologies with AKI, Acute Gastroenteritis was found the most common in age group of 65 to 70 Years and 71 to 75 years of age. Between 76 to 80 years of age, Acute Gastroenteritis and Septicemia most common cause of AKI. Whereas more than 80 years of age, Acute gastroenteritis and Obstructive Cause were observed. [Table 3]

On Urine Examination, Albumin was present in 8%, Sugar was detected in 14%, Pus Cells in 23 % and 5 % had RBC. Albumin was present only in septicemic patients with intrinsic AKI. Sugar was seen in patients of AKI who had diabetes.Mixed findings were also present.

All the Patients were subjected for ncct kub, renal doppler, ultrasound for echogenicity and size of the Kidney. The echogenicity of the kidney was raised in 54 % of the subjects and the size of the Kidney was increased in 2% of the subjects who had obstructive

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uropathy. Renal doppler Was found to be Normal among all the study subjects. Cortico-medullary differentiation which is a hallmark of Chronic Kidney Disease was not seen in any of the patients.

In the Present study nearly 74 % of them were managed by Conservative method and 26 % of them required Dialysis, out of them 9 patients died. [Table 4]

In the present study among those who have expired 9 out of 10 people were on Dialysis i.e 90 % of the subjects who got expired were on Dialysis and only 1

subjects i.e 10 % of them were on Conservative Treatment. [Table 5]

Among the 10 patients who expired, 9 patients were suffering from co morbidities like DM, HTN, CCF, Cirrhosis etc, and 1 patient was without co-morbidity. This result suggests that, association with comorbidity is a bad prognostic sign, causing higher mortality. The severity of AKI also increases with association of other systemic illness, as suggested by higher requirement of renal replacement therapy.

Table 1: Age Group of study participants

Age (in years)	No of Patients	% of Patients
65-70	62	62.0%
71-75	27	27.0%
76-80	9	9.0%
More than 80 Years	2	2.0%

Table 2: Classification of AKI

Type of AKI	No of Patients	% of Patients
Post Renal	6	6.0%
Pre renal / Intrinsic Renal	94	94.0%

Table 3: Etiology of AKI

Etiology	No of Patients	% of Patients
Acute Gastroenteritis	38	38.0%
CCF	11	11.0%
Hepato Renal Syndrome	6	6.0%
Malaria	2	2.0%
Obstructive Cause	6	6.0%
Other causes Of Pre renal AKI (DKA, Heat Stroke, Acid Ingestion etc.)	16	16.0%
Septicemia	21	21.0%

Table 4: Urine Examination

Urine Examination		No of Patients	% of Patients
Albumin	Nil	92	92.0%
	Present	8	8.0%
Sugar	Nil	86	86.0%
	Present	14	14.0%
Pus Cells	Nil	77	77.0%
	Present	23	23.0%
RBC	Nil	95	95.0%
	Present	5	5.0%

Table 5: Treatment and association with outcome of AKI

Management	Outcome			
	Discharge		Expired	
	No of Patients	% of Patients	No of Patients	% of Patients
Conservative	73	81.1%	1	10.0%
Dialysis	17	18.9%	9	90.0%

Table 6: Incidence and Outcome of AKI in Co Morbid Condition.

		Dialysis							
		Not Done				Done			
		Outcome				Outcome			
		Discharge		Expired		Discharge		Expired	
		No of Patients	% of Patients	No of Patients	% of Patients	No of Patients	% of Patients	No of Patients	% of Patients
Comorbid	Absent	47	64.4%	0	0.0%	7	41.2%	1	11.1%
	Present	26	35.6%	1	100.0%	10	58.8%	8	88.9%
P Value		Chi Square = 1.76 p= 0.184				Chi Square = 2.497 p=0.114			

In the present study the age group was found to be statistically non-significant and among those who were expired 60% of them were aged less than 70 years and 40 % were aged between 71 to 75 years of

age. In the Present study all the study subjects who were expired were due to Pre Renal Etiology and the association between type of AKI and Outcome was not significant. Septicemic AKI was the leading

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cause of death with 70% and had more mortality as compared to others 10% followed by AKI due to Congestive Cardiac Failure, Hepatorenal syndrome and other causes. [Table 6]

DISCUSSION

Majority of the Study subjects with acute kidney injury in present study were between 65 to 70 years of age with mean age of the study subjects at 69.25 years. In the study done by Leila Malekmakan et al,[13] the mean age of study group was 67.5 years, in the Study done by Kohli H S et al,[14] the mean age was 65.1. In another study done by Prakash S et al,[15] mean age of 65 years which is similar and comparable to our study findings.

In present study the clinical features most commonly seen are oliguria in 63 %, Diarrhea in 37%, fever in 28 % and breathlessness in 19 %, this was similar to studies done by Eshwarappa M et al,[4] and Liano and Pascual et al.[16]

In present study among 100 patients, Hypertension and Diabetes Mellitus were the most common co morbidities, while in study done by Affifi et al,[17] and Pradeep Kumar Rai et al,[18] Diabetes Mellitus was most common co morbidity at 28 % and 44.4% respectively. In the Present study majority (94%) of the subjects who had Acute Kidney Injury were due to Pre Renal cause. In the studies done by Balushi et al,[19] Liano and Pascual et al,[16] and Kaufman et al, pre-renal causes were observed in 95.4%, 90 % and 83% of patients respectively.

Most common etiology of Acute Kidney Injury was AGE (38%) followed by Sepsis(21%), CCF(11%), HRS(6%), Obstructive causes(6%) and Malaria (2%) while in study done by Eshwarappa M et al,[4] most common etiology of Acute Kidney Injury was Sepsis (38.6%), followed by AGE(10.4%), Obstructive causes (8.4%) CCF (6.8%), Malaria (6.8%) and HRS (6.4%).

KDIGO Staging of the Disease was done based on the serum Creatinine Level it was seen 43% were in Stage 1, 35% in stage 2 and 22 % were in stage 3. The Mortality was also seen among the subjects who were in Stage 2 and stage 3. 80% of them who expired due to AKI were in Stage 3 and 20 % in Stage 2. In the study done by Pradeep Kumar et al,[18] serum Creatinine Level it was seen 47% were in Stage 1, 29% in stage 2 and 24 % were in stage 3.

Among the 100 subjects in our study 10 % of the subjects expired due to Renal failure during the course of the study.In the study done by Areef Ishani et al,[17] the mortality rate with AKI among Elderly was 57.7% which is much higher than our study findings.

Most studies of elderly ICU patients with AKI indicate mortality rates around 63.5% reaching up to 76.2%, as described by Mataloun et al.[11] Pedersen et al,[20] identified a mortality rate of 53.1% in their study, similar to Mårtensson et al,[21] who reported a mortality of 50%.

The Management of the AKI Subjects in our study saw 74 % required conservative and 26% required Dialysis., In the study done by Metcalfe et al,[22] 36 % of the subjects required dialysis who had AKI, Robertson S et al study showed 40 % required dialysis due to AKI.

CONCLUSION

AKI is a disease with substantial global burden and more so in a country like India. AKI is a dynamic disease which requires meticulous management after diagnosis to prevent worsening. The study shows that older age group patients with pre-existing medical illness have a higher mortality and hence should be managed intensively. Currently there is no specific laboratory or radiological test to diagnose AKI and the diagnosis largely rests on criteria based on serum creatinine and urine output, however novel biomarkers are emerging.

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