

**Research Article**

**Analysis of frequency of factors leading to required Hospital acquired acute kidney injury in patients presenting through a tertiary care hospital**

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[Received: 16/12/2018; Accepted: 04/03/2019; Published: 05/03/2019]

**ABSTRACT**

**Introduction:** The incidence of the acute kidney injury (AKI) has been continuously increased over the years. Acute kidney injury (AKI) is a common complication in hospitalized patients. This study was conducted to compare the epidemiological characteristics, clinical factors, and outcomes of HAAKI. **Objectives of the study:** The main objective of the study is to determine the frequency and outcomes of factors leading to required Hospital acquired acute kidney injury in patients presenting through a tertiary care hospital. **Study Design:** This is a descriptive case series in which non probability consecutive sampling technique applied. Patients Admitted in medical in department of medicine Abbasi Shaheed hospital who developed AKI after 48 hours of admission meeting inclusion criteria were enrolled in the study. Inform consent was taken after briefing the pros & cons of the study to the patients. Medical charts were reviewed by the researcher himself to look for factors leading to hospital acquired acute renal failure. Presence of more of these Temperature more than or equal to 38°C, Heart rate more than 90 per minute, Respiratory rate more than 20 per minute, WBC count more than 12 thousand /mm<sup>3</sup> were taken as sepsis. Patients were followed 7 days if alive were taken as survival. **Results:** A total of one hundred & seventy three patients fulfilling the inclusion criteria were recruited in the study. The average mean age of the patient was 60.3±15.69 whereas minimum age was 17 years and maximum age was 90 years respectively. The analysis of factors like (TDDM2, Nephrotoxic Drugs, Sepsis, and Hypotension & Volume blood loss) showed an increase in mortality according to the proportion percentages (32.9%, 69.3%, 67.1%, 67.1%, and 29.5% respectively). Most of the patient's age was follow up <66 years of age i.e. 115(66%). **Conclusion:** It is concluded that the analysis of factors like (TDDM2, Nephrotoxic Drugs, Sepsis, and Hypotension & Volume blood loss) showed an increase in mortality according to the proportion percentages (32.9%, 69.3%, 67.1%, 67.1%, and 29.5% respectively). Out of 173 total numbers of patients 105(61%) patients were survived.

**Keywords:** Epidemiology, hospital acquired acute kidney injury, mortality.

**INTRODUCTION**

Acute kidney injury (AKI) is becoming increasingly common in elderly individuals. The

presence of multiple comorbidities as well as age-related changes in the kidney, systemic

vasculature and immunological system render older patients more prone to renal injury<sup>1</sup>. Hypovolemia, sepsis, and iatrogenic complications related to drug toxicity, contrast-induced nephropathy, and preoperative complications therefore often occur in older hospitalized patients<sup>2</sup>. Although AKI is treated in the same way in elderly individuals and younger patients, elderly individuals are more vulnerable to dialysis-related complications such as hemodynamic instability, bleeding, and mild disequilibrium syndrome<sup>3</sup>. Strategies for the prevention of AKI are particularly important in these fragile patients, but making an early diagnosis is especially challenging in this age group<sup>4</sup>.

The term 'advanced age' has usually been used to describe a condition in which most physiological functions are shutting down and life expectancy is short. Specific age limits after which an individual is considered to be of advanced age have varied over time, and from one society to another<sup>5</sup>. The age of 65 years is most often used as a cut-off for a number of reasons, including the age of eligibility for social security benefits set by the German chancellor Otto von Bismarck in the 1880s, and the age set for the beginning of retirement in the Western world<sup>6</sup>.

Today, advanced age is more of a subjective term rather than having a precise definition, as it is increasingly being recognized that an individual's chronological age does not necessarily reflect their physiological and health status<sup>7</sup>. That being said, definitions of the term 'elderly' vary greatly in the medical literature, the most common limits being 60 years, 65 years, 70 years, 75 years and 80 years. The term elderly comes from the Anglo-Saxon word 'eld', which forms the roots of words that convey wisdom on account of age and experience<sup>8</sup>. Despite its origins, some might regard the term elderly pejorative<sup>9</sup>. We have nonetheless chosen to use this word throughout this article, as it is the term most commonly used in the medical literature to describe individuals of

advanced age, and will therefore make the topic easily recognizable to readers<sup>10</sup>.

## OBJECTIVES

The basic objectives of the study are:

- TO determine the frequency of factors leading to required Hospital acquired acute kidney injury in patients presenting through a tertiary care hospital
- To determine the outcome in patients with required Hospital acquired acute kidney injury in patients representing to through a tertiary care hospital

## MATERIALS AND METHODS

This descriptive case series study with total duration of six months was conducted at Department of Medicine Abbasi Shaheed Hospital, Karachi. There are 173 patients that were included in this study.

### Inclusion criteria

- Patient with hospital acquired acute kidney injury diagnosed as defined earlier
- Patients with (Serum creatinine less than 1.5 ml) on admission
- Age range 35 to 65 Years
- Either gender

### Exclusion criteria

- Pregnant women with AKI
- Patients of acute on chronic renal failure
- Patients with community acquired AKI
- Surgical intensive care unit patients
- Comorbid conditions like CVD

### Data Collection

Patients Admitted in medical in department of medicine Abbasi Shaheed hospital who developed AKI after 48 hours of admission meeting inclusion criteria will be enrolled in the study. Informed consent will be taken after briefing the pros & cons of the study to the patients. Medical charts will be reviewed by the researcher himself to look for factors leading to hospital acquired acute renal failure. Use of nephrotoxic drugs like gentamycin for two or more days before to acute

renal failure will be taken as factors causing hospital acquired AKI. Presence of more of these Temperature more than or equal to 38°C, Heart rate more than 90 per minute, Respiratory rate more than 20 per minute, WBC count more than 12 thousand /mm<sup>3</sup> will be taken as sepsis. Blood pressure will be measured on line position two times four hours apart if SBP less than 80 millimeter mercury it will be taken as hypotension. Decrease in motivate of 5% or more from the base line after 48 hours of admission will be taken as volume loss. Patients will be followed 7 days if alive will be taken as survival. Information regarding factor, outcome and demographic like age, gender, morbid like diabetic mellitus will be collected and entered in to the preformed attached as annexure.

#### Data Analysis

Data will be entered and analysis in to Spss version 21. Mean±SD will be calculated like age of

the patients. Whereas Frequency & Percentages will also be calculated like gender distribution, comorbid (T2DM), outcome of survival (Y/N) & factors like (Nephrotoxic Drugs, Sepsis, and Hypotension & Volume blood loss) as appropriate.

#### RESULTS

A total of one hundred & seventy three cases after fulfilling the inclusion criteria were recruited in our study. Hundred & seventy two cases fulfilling inclusion criteria were registered through Emergency Department of Medicine Abbasi Shaheed Hospital, Karachi. Demographic history including age (in years) and sex (male or female) were taken. The average mean age of the patient was 60.3±15.69 whereas minimum age was 17 years and maximum age was 90 years respectively as shown on (Table 01).

**Table 01:** Descriptive statistics of age of the patients

Age of The Patients								95% C.I	
Age	N	Min	Max	Range	Mean	SD	Median	Upper	Lower
Years	173	17	90	73	60.30	15.69	66	57.94	62.66

The category of age distribution were followed 2(1.1%) between the age of <17 years, 9(5.2%) followed between 18-27 years & finally most of the patients were followed >58 years 116(67.1%) respectively as shown on (Table 02).

**Table 02:** Age distribution of the patients

Age Groups Distribution	Frequency(f)	Percentages (%)
<=17 Years	2	1.1%
18-27 Years	9	5.2%
28-37 Years	12	6.9%
38-47 Years	9	5.2%
48-57 Years	25	14.5%
>58 Years	116	67.1%
Total	173	100%

Table 03 shows the frequency of type II diabetes among patients. Frequency and percentages are shown in the table. The analysis of factors like (TDDM2, Nephrotoxic Drugs, Sepsis, and Hypotension & Volume blood loss) showed an increase in mortality according to the proportion percentages (32.9%, 69.3%, 67.1%, 67.1%, and 29.5% respectively).

**Table 03:**Frequency of Type II Diabetes(N=173)

Type II Diabetes	Frequency(f)	Percentages (%)
Yes	57	32.9%
No	116	67.1%
Total	173	100%

Table 04 shows the frequency of nephrotoxic drugs among selected patients. It shows that there were 69.3% patients who were using these drugs and almost 30.7% were not using these drugs previously.

**Table 04:**Frequency of Nephrotoxic Drugs

<i>Nephrotoxic Drugs</i>	Frequency(f)	Percentages (%)
Yes	120	69.3%
No	53	30.7%
Total	173	100%

## DISCUSSION

The incidence of the acute kidney injury (AKI) has been continuously increased over the years. This is a difficult burden for the staff and cost of the intensive care units. In the previous year's epidemiological survey about the AKI was not carried out in Hungary<sup>11</sup>.

We have no controlled data about the epidemiology of AKI in critically ill patients. We have no standardized protocol for the treatment of kidney injury<sup>12</sup>. There are no consistent methods for acute renal replacement therapy in intensive care units<sup>13</sup>. There is not a specified and secured condition system for the management of acute kidney injury in Hungarian intensive care units. The lack of adequate financial refund for the renal replacement therapies is also a major problem<sup>14</sup>.

There have been many studies of the epidemiology of acute renal failure. However, in most cases, the definition of acute renal failure rests on arbitrary biochemical cut-off points. These biochemical dividing lines vary from study to study making comparisons difficult. Biochemical subdivisions also have no clear

association with outcome<sup>15</sup>. On the other hand, the need to start renal replacement therapy (severe ARF) defines as a quantum leap in illness severity, cost of care, and complexity of treatment, which has been demonstrated to be associated with a poor prognosis<sup>16</sup>. Furthermore, the combined need for dialysis and ICU care defines a group of patients with an even poorer prognosis<sup>17</sup>.

### **In the present study Out of 173 total numbers of patients 105(61%) patients were survived.**

Mortality was the highest in ICU (73.5%) which was statistically significant in comparison to that of the other two units (P = 0.003). This higher incidence may be partly due to the high percent of multiple organ involvement in the ICU patients<sup>18</sup>. In general, indication for ICU admission itself also is an indicator of the severity of primary illness which directly influences the mortality rate. The overall mortality in three units was 51.3%, which was quite similar (51%) to that of Biradaret al.<sup>19</sup> Similar to our finding, the reported rate of mortality of HAAKI ranges from 25% to 70%<sup>20</sup>. Mortality in ICU in this study was in

accordance with earlier studies where that ranges from 60.3 to 76.2%<sup>21</sup>. The mortality in the medical unit (37%) was higher in contrast to other studies (14-24.8%).

## CONCLUSION

It is concluded that the analysis of factors like (TDDM2, Nephrotoxic Drugs, Sepsis, and Hypotension & Volume blood loss) showed an increase in mortality according to the proportion percentages (32.9%, 69.3%, 67.1%, 67.1%, and 29.5% respectively). And out of 173 total numbers of patients 105(61%) patients were survived.

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