



TO STUDY THE CORRELATION BETWEEN DEMOGRAPHIC PROFILE AND INCIDENCE OF CONTRAST-INDUCED NEPHROPATHY OF STUDY POPULATION UNDERGOING CORONARY ANGIOGRAPHY AND RENAL ANGIOGRAPHY IN HOSPITALS OF NORTHERN INDIA

Dr. Neeraj Dhar*	Post DM Senior Resident, Gastroenterology, Skims, Soura *Corresponding Author
Dr. Zaffar Kawoosa	Post DM Senior Resident, Gastroenterology, Smhs, Hospital
Dr. S. K. Bali	Professor Internal Medicine, GMC, Jammu
Dr. Neha Joshi	Internal Medicine
Dr. Sajad	Faculty, Skims Medical College / Hospital, Bemina

ABSTRACT

AIM: To Study the various demographic variables in radio-contrast induced nephropathy Cases

METHODS: The present prospective study on "incidence of contrast-induced nephropathy" was conducted on the patients admitted in the cardiac care unit Total of 254 patients were taken. All the subjects included in the study underwent coronary / renal angiography using 50-60ml of iohexol non-ionic radiopaque contrast media. All the patients were subjected to a detailed history, clinical examination and laboratory investigations which were recorded in the predesigned performa for this study.

RESULTS: More male patients (152; 59.84%) were observed than female patients (102; 40.16%) during the study period. Male to female ratio was 1.49:1. Most male patients 51 (33.55%) were observed in 50-59 years age group, followed by 49 (32.24%) in 60-69 years age group, followed by 22 (14.47%) in > 70 years age group. Similarly, female patients were 33 (32.35%) in 50-59 yr age group, followed by 27 (26.47%) in 60-69 years age group followed by 21 (20.59%) in > 70 years age group. Least number of male patients were 6 (3.95%) observed in 19-29 years of age group. Similarly, only 3 (2.94%) female patients were observed in 19-29 yrs age group. Most patients were from urban back ground with 173 (68.11%) whereas 81 patients belonged to the rural areas (31.88%).

CONCLUSION: Contrast media (CM) are increasingly used in diagnostic and interventional procedure. This results in the rising incidence of iatrogenic renal function impairment caused by exposure to CM, a condition known as CIN

KEYWORDS : Contrast media/adverse effects, Acute kidney injury/chemically induced, Renal dialysis, Severity of illness index, Risk assessment, Prognosis

INTRODUCTION

Contrast-Induced Nephropathy (CIN) is defined as a 25% increase in serum creatinine from the baseline value or an absolute increase of at least 0.5 mg/dl which appears within 48 hrs after the administration of radiographic contrast media and is maintained for 2-5 days (1). CIN is the third leading cause of hospital – acquired renal failure (2). CIN is significant but underestimated cause of iatrogenic acute renal failure in clinical practice. CIN is also known as contrast nephropathy / contrast – nephrotoxicity / contrast media nephropathy / contrast agent nephropathy. The exact underlying mechanism of nephrotoxicity is likely to involve the following pathogenic factors:

INTRINSIC CAUSES:

- Increased vaso constrictive forces
- Decreased local prostaglandin and nitric oxide mediated vasodilation.
- Direct toxic effect on renal tubular cells with damage caused by O_2 free radicals.
- Increase O_2 consumption
- Increased intra-tubular pressure secondary to contrast culminating in renal medulla ischemia.

Intrinsic causes act in concert with harmful extrinsic pre-renal causes such as dehydration and decreased effective intravascular volume to increase the risk of nephrotoxicity.

Risk factor for the development of CIN:

FIXED (NON-MODIFIABLE) RISK FACTORS

- Old age
- Diabetes mellitus
- Pre-existing renal failure
- Advanced CHF
- Low LVEF
- Acute myocardial infarction.
- Cardiogenic shock

Modifiable Risk Factors:

- Volume of contrast media
- Hypotension
- Anemia
- Dehydration
- ACE inhibitors
- Diuretics
- NSAIDS(3)

Clinical Features:

CIN most commonly manifests as a non-oliguric and asymptomatic decline in renal functions (4). The serum creatinine levels begin to rise within 24 hrs after administration of contrast medium. Creatinine levels typically peaks on 2nd and 3rd day following contrast, returns to baseline within 10-14 days (5). Oliguric acute renal failure requiring hemodialysis can also occur. This condition presents with oliguric within 24 hr of contrast administration and typically persists for 2-5 days (6). Morbidity and Mortality rates are significantly higher in this group of patient when compared with those who have non-oliguric renal failure (7).

MATERIALS AND METHODS

The present prospective study on "incidence of contrast-induced nephropathy" was conducted on the patients admitted in the cardiac care unit of the tertiary care Hospital in North India. The patients of acute coronary syndrome in whom coronary angiography was indicated comprised the study population. Total of 254 patients were taken. All the subjects included in the study underwent coronary / renal angiography using 50-60ml of iohexol non-ionic radiopaque contrast media.

METHODS:

All the patients were subjected to a detailed history, clinical examination and laboratory investigations which were recorded in the predesigned performa for this study.

INCLUSION CRITERIA

1. Age > 19 years of either gender
2. Acute coronary syndrome: tropT +ve/ TropT -ve
3. With or without Diabetes Mellitus type 1 and type 2 on insulin or OHD
4. With or without Renal insufficiency- serum creatinine concentration > 1.5 mg/dl
5. With or without Multivessel disease

EXCLUSION CRITERIA

1. Intake of nephrotoxic drugs within previous 7 days
2. Renal transplantation and ESRD
3. History of serious reaction to iodinated contrast medium
4. Newly discovered unstable diabetes
5. Intravascular administration of an iodinated contrast medium within previous 48 hours
6. Pregnant/ lactating women

RESULTS

The present study was carried out in a tertiary care center .A total of 254 patients undergoing (coronary/ renal) angiography were selected and studied with respect to their demographic profile.

Table No. 1: Genderwise distribution of Patients

S.No	Gender	No. of Patients	Percentage
1	Male	152	59.84
2	Female	102	40.16
	Total	254	100

More male patients (152; 59.84%) were observed than female patients (102; 40.16%) during the study period. Male to female ratio was 1.49:1.

Table No. 2:- Age and Genderwise distribution of patients.

S.No	Age group (in years)	Male		Female		Total
		Number	Percentage	Number	Percentage	
1	19-29	6	3.95	3	2.94	9
2	30-39	7	4.61	4	3.92	11
3	40-49	17	11.18	14	13.73	31
4	50-59	51	33.55	33	32.35	84
5	60-69	49	32.24	27	26.47	76
6	>70	22	14.47	21	20.59	43
	Total	152	100	102	100	254

Most male patients 51 (33.55%) were observed in 50-59 years age group, followed by 49 (32.24%) in 60-69 years age group, followed by 22 (14.47%) in > 70 years age group.

Similarly, female patients were 33 (32.35%) in 50-55 yr age group, followed by 27 (26.47%) in 60-69 years age group followed by 21 (20.59%) in > 70 years age group.

Least number of male patients were 6 (3.95%) observed in 19-29 years of age group.

Similarly, only 3 (2.94%) female patients were observed in 19-29 yr age group.

Table No. 3:- Rural/Urban Distribution of Patients

S.No		Male	Percentage	Female	% age	Total
1	Urban	110	72.37	63	61.76	173
2	Rural	42	27.63	39	38.24	81
	Total	152	100	102	100	254

Most patients were from urban back ground with 173 (68.11%) whereas 81 patients belonged to the rural areas (31.88%).

DISCUSSION

CIN is the third leading cause of hospital-acquired renal failure. CIN is significant but underestimated cause of iatrogenic acute renal failure. An overall incidence of CIN in general population is reported

to be 0.6-2.3%. Incidence rate may vary from 0% to 90% depending on the presence of risk factor, most notably chronic renal insufficiency, diabetes mellitus, age > 70 yr, and high contrast volume administered (3) Thirty-day mortality rate was 16.2%, compared with 1.2% for patients who did not develop CIN & 1-yr mortality rate (23.3%) compared with those who did not develop CIN, (8). We have carried out a hospital based, descriptive study in 254 patients .In this study, females comprise 102 (40.10%) and males comprise 152 (59.84%), maximum were in the age group of 50-59 years (33.07) while those in the age group of 60-69 years (29.92%) and > 70 yr age group comprise (16.92%) and 40-49 years age group comprise (12.20%) and least where in the age group 19-29 (3.54%). It was found that males had higher incidence of coronary artery disease and also it is a male dominance society. So male population was higher than female population.

In the present study incidence of CIN was 11.02%.

CONCLUSION

Contrast media (CM) are increasingly used in diagnostic and interventional procedure. This results in the rising incidence of iatrogenic renal function impairment caused by exposure to CM, a condition known as CIN.

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