

## A study on Epidemiology and Symptomatology and Glomerular Filtration Rate (GFR) in Pre-dialysis Chronic Kidney Disease patients

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### Abstract

**Introduction:** Longitudinal studies have established that Cardiovascular Disease (CVD) occur more frequently and are the leading cause of death in Chronic Kidney Disease (CKD). Dyslipidemia has been established as an important risk factor in the pathogenesis of CVD in CKD patients. **Objectives:** Present study was aimed to evaluate (in CKD patients), Demography along with Symptomatology and Glomerular Filtration Rate (GFR) in Pre-dialysis Chronic Kidney Disease patients (Study cases). **Methods:** Present Cross-sectional study, conducted in Department of Medicine, R.D. Gardi Medical College and CRG hospital, Ujjain, M.P. from 1<sup>st</sup> January 2015 to 31<sup>st</sup> July 2016. We studied 115 pre-dialysis CKD cases and 100 age & sex matched controls. CKD was diagnosed as per 2012 KDOQI Criteria. **Result:** In CKD cases, maximum 23.47% cases belonged to fifth decade. Mean age was  $48.99 \pm 16.74$ . Male to Female ratio was 1.21: 1. In the present study of 115 Study cases, pallor was present in ninety five (82.6%) cases, followed by facial puffiness in eighty eight (76.5%) cases, pedal oedema in eighty two (71.3%) cases and oliguria in eighty (69.5%) cases. Hypertension was evident in eighty seven (75.6%) cases. The mean Serum Creatinine, Urea, Total Protein, albumin, Potassium, Phosphorus value were increased in Study group as compared to control group. The mean Serum Calcium value was decreased in Study group as compared to control group.

**Keywords:** Chronic Kidney Disease, Cardio Vascular disease, Dyslipidemia

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### Introduction

Chronic kidney disease (CKD) encompasses a spectrum of different pathophysiologic processes associated with abnormal kidney function, and a progressive decline in glomerular filtration rate (GFR)[1]. Cardio-Vascular Disease (CVD) is the leading cause of death, irrespective of race and ethnicity, and is mostly caused by cardio-metabolic risk factors and chronic kidney disease (CKD)[2]. In the United States, the prevalence of CVD in CKD patients reaches 63%, in contrast with only 5.8% in people without CKD, and this prevalence is directly correlated with the severity of CKD [3]. Cardiovascular disease accounts for 40% to 50% of deaths in dialysis patients. In dialysis-dependent end-stage renal disease (ESRD) patients, the risk of cardiovascular (CV) mortality is 10-fold to 20-fold higher than in age and gender-matched control subjects without CKD[4]. The median survival of dialysis patients with baseline Heart Failure (HF) has been estimated to be 36 months, in contrast with 62 months for those without baseline HF<sup>5</sup>. Objective of the study to identify the Age, Gender, Symptomatology and Glomerular Filtration Rate (GFR) in Pre-dialysis Chronic Kidney Disease patients (Study cases).

### Materials and methods

The present study is **Cross-sectional study**, conducted in the Department of Medicine, R.D. Gardi Medical College and CRG hospital, Ujjain, M.P. from 1<sup>st</sup> January 2015 to 31<sup>st</sup> July 2016. We studied 115 cases of CKD and 100 age & sex matched controls. CKD was diagnosed by clinical examination, biochemical analysis and sonological findings as per the 2012 Kidney Disease Outcomes Quality Initiative (KDOQI) Criteria.

**Inclusion Criteria:** All patients of Chronic Kidney Disease with age 18 years or above, who give consent for study.

#### Exclusion Criteria:

1. Patients who do not fill the above criteria.
2. Patients with End Stage Renal Disease (CKD- Stage 5) on Hemodialysis.
3. Patients with Diabetes Mellitus.
4. Patients already on lipid lowering drug therapy.

#### Statistical analysis

Statistical software **SPSS 23.0** was used for the analysis of data.

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## Observation and results

Table 1: Age-Wise Distribution of Study group and Control group.

S.No.	Age group (in years)	Study group (n=115)		Control group (n=100)	
		No. of cases	Percentage	No. of cases	Percentage
1	18-20	1	0.86	5	5
2	21-30	18	15.65	28	28
3	31-40	21	18.26	11	11
4	41-50	27	23.47	14	14
5	51-60	23	20	19	19
6	61-70	14	12.17	19	19
7	>70	11	9.56	4	4

Table 2: Mean age of cases in Study and Control group-

S.No.	Sex	Study group			Control group		
		Mean age	S.D.	Range (in years)	Mean age	S.D.	Range (in years)
1	Overall	48.99	16.74	20-92	44.12	17.61	18-76
2	Male	53.55	16.37	21-92	44.89	18.99	18-76
3	Female	43.46	15.59	20-76	43.21	16.01	21-72

Table 3: Gender-Wise Distribution of Study group and Control group.

S.No.	Gender	Study group (n=115)		Control group (n=100)	
		No. of cases	Percentage	No. of cases	Percentage
1	Male	63	54.8	54	54
2	Female	52	45.2	46	46
3	M:F	1.21 : 1		1.17 : 1	

Table 4: Clinical Profile of Study cases (CKD Patients)

S.no.	Feature	No. of patients (n=115)	Percentage
1	Facial Puffiness	88	76.5
2	Pedal Oedema	82	71.3
3	Oliguria	80	69.5
4	Pallor	95	82.6
5	Hypertension	87	75.6

Table 5: Biochemical Parameters in Study group and Control group.

S.No.	Biochemical Parameter	Study group (n=115)		Control group (n=100)		t-value	P-value for Independent t-test
		Mean	S.D.	Mean	S.D.		
1	Blood Urea	204.75	84.12	14.11	4.34	24.27	0.000
2	Serum Creatinine	8.34	4.55	0.75	0.29	17.88	0.000
3	Serum Total Proteins	6.08	0.62	6.80	0.46	9.70	0.000
4	Serum Albumin	3.33	0.53	4.23	0.33	14.99	0.000
5	Serum Sodium	138.35	7.12	139.85	5.29	1.76	0.081
6	Serum Potassium	5.51	1.27	4.28	0.71	8.85	0.000
7	Serum Calcium	8.30	1.29	8.93	0.77	4.42	0.000
8	Serum Phosphorus	7.29	2.13	3.66	0.83	16.87	0.001
9	Hemoglobin	7.60	2.54	12.02	1.56	15.50	0.000

## Discussion

## Age and Gender

In Study group (n=115), maximum twenty seven (23.47%) cases were in fifth decade; mean age was  $48.99 \pm 16.74$  & Male: Female ratio was 1.21: 1.

In Control group (n=100), maximum twenty eight (28%) cases were in third decade; mean age was  $44.12 \pm 17.61$  & Male: Female ratio in Control group was 1.17: 1.

Similar observations were obtained by Aharwar et al<sup>6</sup> in 2015 in his study of 100 cases and the mean age of patients and controls was  $47 \pm 16$  yrs. (range 14- 81 yrs) and  $47.68.46 \pm 15.95$  yrs (range 15-78yrs) respectively & Male: Female ratio 1.27 : 1.

Avasthi G et al[7] in 2001 in their study of 30 patients obtained similar age distribution of patients in their study with mean age of patients and controls--  $51.17 \pm 13.53$  (Range 22-70 years) and  $49.80 \pm 15.20$  (Range 21- 75 years) respectively. Jungers P et al[8] in 1996 had similar observation about Gender distribution with a marked preponderance of males.

**Symptomatology-** In the present study of 115 Study cases, pallor was present in ninety five (82.6%) cases, followed by facial puffiness in eighty eight (76.5%) cases, pedal oedema in eighty two (71.3%) cases and oliguria in eighty (69.5%) cases. Hypertension was evident in eighty seven (75.6%) cases. Similar findings were observed by

Aharwar et al<sup>6</sup> in 2015 in which facial puffiness was present in 48%, pedal oedema in 70%, oliguria in 62% and pallor in 76% cases.

**Biochemical parameters**-The mean Blood Urea value was increased (statistically highly significantly) in Study group as compared to control group. Similar finding was observed by Raju et al<sup>9</sup> in 2013 in their study of 95 cases.

The mean Serum Creatinine value was increased (statistically highly significantly) in Study group as compared to control group. Similar observations were obtained by Aharwar et al<sup>13</sup> in 2015 & Raju et al<sup>9</sup> in 2013. The mean Serum Total Proteins value was increased (statistically highly significantly) in Study group as compared to control group. In 2015, Aharwar et al<sup>6</sup> studied 100 cases of CKD and obtained similar results. The mean Serum Albumin value was increased (statistically highly significantly) in Study group as compared to control group. Similar finding was observed by Aharwar<sup>6</sup> et al in 2015. The mean Serum Sodium value was decreased (statistically non-significant) in Study group as compared to control group.

The mean Serum Potassium value was increased (statistically highly significantly) in Study group as compared to control group. Hsieh et al<sup>10</sup>, in 2011, also obtained higher values of mean Serum Potassium in CKD patients. The mean Serum Calcium value was decreased (statistically highly significantly) in Study group as compared to control group. Sharma et al<sup>11</sup>, in 1990, observed mean Serum Calcium level significantly decreased in CKD patients.

The mean Serum Phosphorus value was increased (statistically highly significantly) in Study group as compared to control group. Caravaca et al<sup>12</sup> in 2011 obtained significant correlation between GFR and hyperphosphatemia.

The mean Blood Hemoglobin value was decreased (statistically highly significantly) in Study group as compared to control group. Suresh M<sup>13</sup> et al in 2012 in his study of 50 CKD patients obtained mean Blood haemoglobin level  $8.83 \pm 1.78$  gm/dl and p-value = 0.0001, which was highly significant.

#### Conclusion

Patients with CKD are predisposed to accelerated atherosclerosis leading to increased cardiovascular complications. Several factors contribute to atherogenesis, most notable among which is dyslipidemia. TC, TG, LDL-C, VLDL-C increase and HDL-C decrease in CKD, however significant derangement is seen in levels of TG, VLDL-C and HDL-C.

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