# Demographics and Clinical Characteristics of Left Ventricular Diastolic Dysfunction Patients with Chronic Renal Impairment

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## ABSTRACT

**Aim:** To analyze demographic as well as clinical characteristics of chronic renal impaired patients with formation of left ventricular diastolic dysfunction.
**Study Design:** Cross-sectional
**Place and Duration of Study**: Shaikh Zayed Medical Complex, Lahore from 1st January 2018 to 30th June 2018.
**Methods:** One hundred and fifty five patients with chronic renal impairment between the age group of 18-65 years were included. Patient's demographics, clinical characteristics, cardiovascular risk profiles, and laboratory findings for hemoglobin levels were recorded. Echocardiography was performed to assess LV function using standard criteria.
**Results:** The mean age was 45.98±6.43years, and 52.98% of left ventricular diastolic patients were females. A total of 74.83% of patients were hypertensive, and 73.54% were anemic. The independent interpreters of left ventricular diastolic dysfunction were anemia, age, hypertension and female gender
**Conclusion:** Left ventricular dysfunction is significantly prevalent among chronic renal impairment patients and is associated with anemia, hypertension and female gender
**Keywords:** Chronic renal impairment, Left ventricular dysfunction, Prevalence

## INTRODUCTION

Patients with chronic renal impairment (CRI) are at major risk of cardiac complications.[1] Almost 40% of world's death toll is assigned to association of cardiac disease with end stage renal impairments. The risk of cardiovascular mortality is ten time higher in end stage renal disease in comparison with patients having socio demographically similar s age sex and race[2].

The main factors resulting in an end stage renal impaired patients to become a cardiac patients include augmented calcium and phosphorus products, uremic toxins, anemia, and surplus fluids[3,4]. In addition higher incidences of vascular or valvular calcification also cause stiffness of arteries and adverse cardiac outcomes.

One of the most important risk factors in CRI patients is left ventricular (LV) dilatation with hypertrophy, diastolic dysfunction, and high LV filling pressure.[5] Studies have reports a higher abnormal frequency of diastolic dysfunction in patients with chronic renal impairments especially on hemodialysis[6,7].

Echocardiography facilitates the estimation of the diastolic dysfunction of the ventricle.[8]Its evaluation is based on different variables including transmitral pulsed wave Doppler flow and mitral annular tissue Doppler signals[9].

A significant association between demographic and clinical characteristics such as age, gender, palpitation, shortness of breath, hypertension and hemodialysis history has been noticed in international studies[10,11].

The present study focuses on assessing demographics and clinical features of LV diastolic dysfunction in patients with chronic renal impairments.

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## PATIENTS AND METHODS

It was a cross sectional study conducted in department of cardiology, Shaikh Zayed Medical Hospital, Lahore from 1st January 2018 to 30th June 2018. The study included 155 patients from both genders. The age of patients was between 18-65 years. Patients with chronic renal impairment and a significant hemodialysis history were included. Baseline sinus rhythm was assessed by electro cardio graphic reports. Left ventricular ejection fraction >50% was considered in inclusion criteria. The patients who were having known history of any other ischemic heart disease and organic valvular heart disease were excluded from the study. Each enrolled patient was asked to fill written informed consent before participating in the study. A well structured questionnaire was used for obtaining information regarding demographic variable and clinical characteristics such as age and gender, BMI, LV diastolic dysfunction, and hemodialysis history. The data was entered and measured in computer software SPSS-21.

## RESULTS

Age distribution of the patients was recorded, which shows majority of the patients were distributed between age 41-50 and between 41-50 years of age i.e. 50(32.2%), 44(28.3%) were between 31-40 years, 37(23.87%) were between 21-30 years and only 9(5.8%) were between 18-20 years of age, mean and SD was calculated as 45.98±6.43 years (Table1).Gender distribution of the patients showed 79(50.96%) male and 76(49.03%) were females (Table 2).

Hypertension and anemia was noticed in 116 and 114 cases out of 155 total participants respectively. Most of the patients were having normal weight, however 30% patients were having BMI >30 (obese).Stratification for age in

patients with LV diastolic dysfunction (n=134) was recorded which shows 6(4.5%) out of 9 cases between 18-20 years, 28 (20.89%) out of 37 cases were between 21-30 years, 37(27.80%) out of 41 cases were between 31-40 years, 49(36.5%) out of 50 cases were between 41-50 years of age (Table 3).

Stratification for gender in patients with LV diastolic dysfunction reveals 63(47.01%) out of 79 males, and 71(52.98%) out of 76 females (Table 4). Stratification for duration of dialysis in patients with LV diastolic dysfunction reveals 25 had 0.5-1 year of duration of dialysis, 40 were between 1-2 years of duration, 66 were between 2-5 years of duration and 24 were between 5-10 years of duration of dialysis (Table 5).

Table 1: Age distribution of the patients (n=155)

| Age (years) | No. | % |
|---|---|---|
| >20 | 9 | 5.8 |
| 21-30 | 37 | 23.87 |
| 31-40 | 44 | 28.38 |
| 41-50 | 50 | 32.2 |
| >51 | 15 | 9.67 |
| Mean and SD | 45.98±6.43 | |

Table 2: Gender distribution of the patients (n=155)

| Gender | No. | % |
|---|---|---|
| Male | 79 | 50.96 |
| Female | 76 | 49.03 |

Table 3: Stratification of age in patients with LV diastolic dysfunction (n=134)

| Age (years) | No. | % |
|---|---|---|
| >20 | 6 | 4.5 |
| 21-30 | 28 | 20.89 |
| 31-40 | 37 | 27.61 |
| 41-50 | 49 | 36.56 |
| >51 | 14 | 10.44 |

Table 4: Stratification of gender in patients with LV diastolic dysfunction (n=134)

| Gender | No. | % |
|---|---|---|
| Male | 63 | 47.01 |
| Female | 71 | 52.98 |

Table 5: Stratification for duration of dialysis in patients (n=155)

| Duration of dialysis (years) | No. | % |
|---|---|---|
| 0.5-1 | 25 | 16.12 |
| 1-2 | 40 | 25.80 |
| 2-5 | 66 | 42.59 |
| 5-10 | 24 | 15.49 |

## DISCUSSION

The demographic and clinical representation of end stage renal impaired patients with diastolic dysfunction becomes complicated. The indicators for proper assessment and treatment involved are Echocardiographic measurements, history of hemodialysis, age, weight, anemia and hypertension. These indicators have been internationally relied upon for better patient management and cure[12-13].

The present study reports the prevalence of diastolic dysfunction was found as 86% in total chronic renal impaired patients. A study reported 68.6% prevalence of diastolic dysfunction in end stage renal disease patients[14].

In this study a significant trend towards more diastolic dysfunction cases and CRI could be seen with increasing age. The mean age observed was as 43.54±6.21. Similar has been reported in another study with 48±13 years as mean age of CRI patients with renal impairment with overall patients enrolled as males (54.5%). Similar has been seen in the present study with 50.96% male out of total enrolled patients[14].

Overall gender distribution did not predict LV diastolic dysfunction in CRI patients. However a significant correlation between female gender and presence of LV diastolic dysfunction was found in present study as well as reported elsewhere[15]. A study conducted in Sweden reported prevalence of female patients with renal impairment and diastolic dysfunction as 65%[16].

The anemic patients had five time higher prevalence of LV diastolic dysfunction than in non anemic as also reported in the present study. Similar has been concluded in another international study[17].

The present study reports almost similar demographic and clinical representation as already reported in studies from Saharan region of Africa[18,19]. This predicts that similar age and gender are effected by diastolic dysfunction in CRI patients, also highlighting them as target group in dire need of change in lifestyle for prevention and formation of any cardiac event.

## CONCLUSION

Middle age group, female gender, history of hemodialysis, anemia and hypertension are major risk factors for development of diastolic dysfunction in chronic renal impaired patients.

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