

**“STUDY OF PULMONARY ARTERIAL  
HYPERTENSION IN PATIENTS WITH  
CHRONIC KIDNEY DISEASE AND ITS  
CORRELATION WITH STAGES”**

Dr. Ashwani Pandey, Dr. Aadish Kumar Jain,

Dr. S B Gawarikar, Dr. Vijay Garg

Dr. Ashish Sharma, Dr. Rajesh Deshpandey

Department of Medicine,

R.D. Gardi medical college, Ujjain (M.P.)

# INTRODUCTION

- Chronic kidney disease (CKD) is associated with abnormality in kidney function and progressive decrease in glomerular filtration rate (GFR).
- Different stages of Chronic kidney disease are classified by both estimated GFR and degree of albumin in the urine.

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- The population of India is projected to risk of developing chronic diseases like diabetes mellitus and hypertension. About 25 to 40% of them may develop CKD.
- Pulmonary hypertension (PH) is an important cause of cardiovascular morbidity in ckd.

- Pulmonary arterial hypertension is defined by a resting mean pulmonary artery pressure at or above 25 mm Hg.
- Pulmonary hypertension mostly remains asymptomatic until right ventricular dysfunction.

- The gold standard for the diagnosis of PH is right heart catheterization (RHC). Transthoracic echocardiography is recommended for PH screening.
- This study focusses on the PAH in CKD, and to the correlation between the severity of PAH with different stages of chronic kidney disease.

# AIMS AND OBJECTIVES

1. To Study Pulmonary Arterial Hypertension in CKD Patients.
2. To Know the Correlation Between The Severity Of PAH and the Different Stages of CKD.

# METHODS AND DATA COLLECTION

All 96 study cases were subjected to detailed history, clinical examination and investigations like-

1. Urea, creatinine-
2. Urine routine microscopy and Urine ACR (Albumin-creatinine ratio)
3. USG whole Abdomen
4. Chest X RAY PA
5. Blood sugar level
6. ECG
7. 2D Doppler echocardiography

# MATERIAL AND METHODS

- The present study was conducted in department of medicine, C. R.Gardi Hospital associated with R.D.Gardi Medical College, Ujjain, M.P.
- **Sample size- 96 patients.**
- **Study design- Observational study.**

## **Inclusion criteria-**

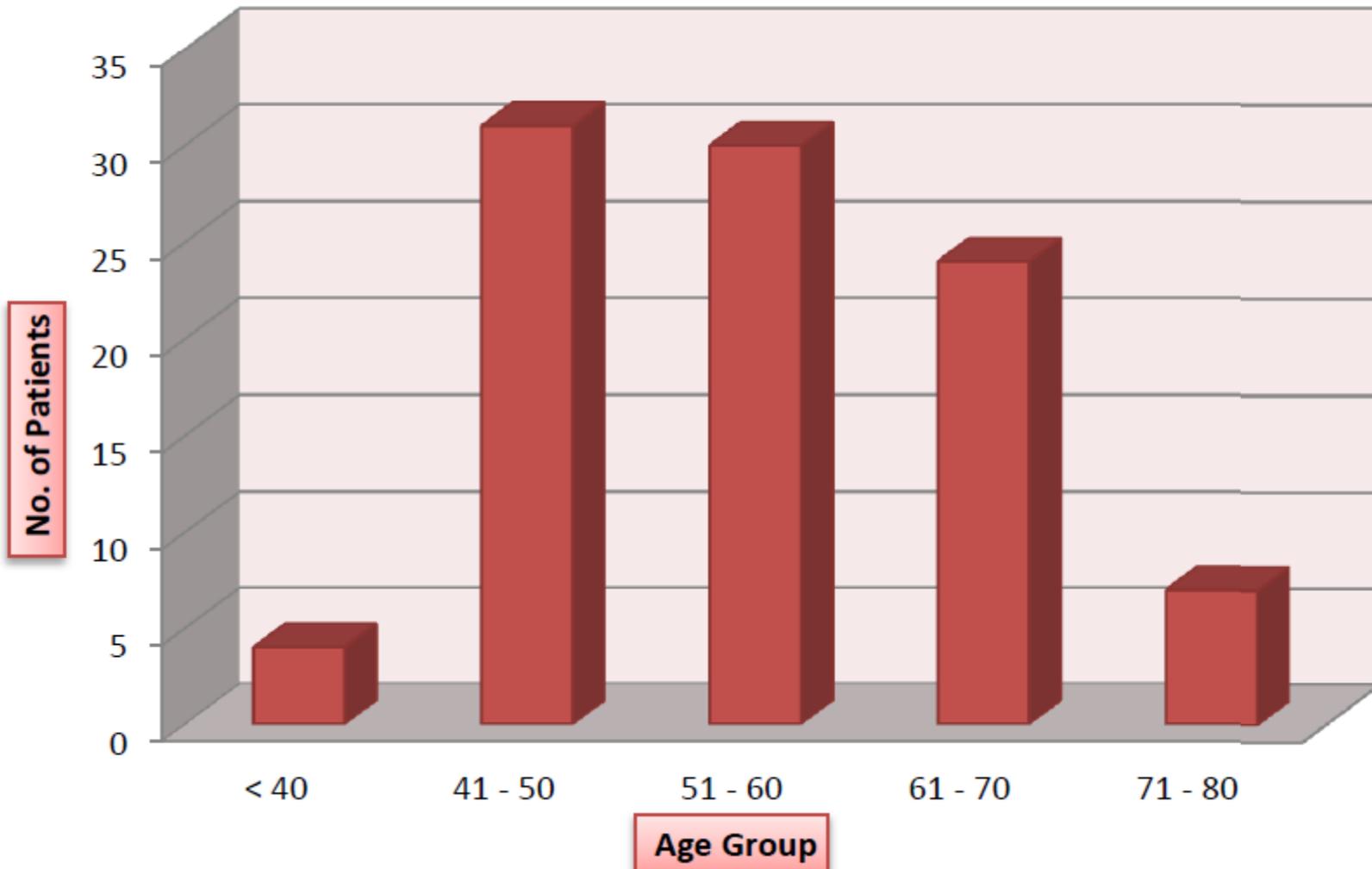
1. Symptoms of uremia for  $>3$  months.
2. Blood urea , creatinine or decreased creatinine clearance or estimated glomerular filtration rate (eGFR).
- 3 Urine albumin creatinine ratio (UACR).
4. USG changes- Bilateral kidney size  $<8$  cm.

## **Exclusion criteria-**

1. Acute illness, burns, trauma ,severe sepsis.
2. Patients on drugs.
3. Patients with HIV infection.
4. Chronic Lung diseases and valvular heart disease.

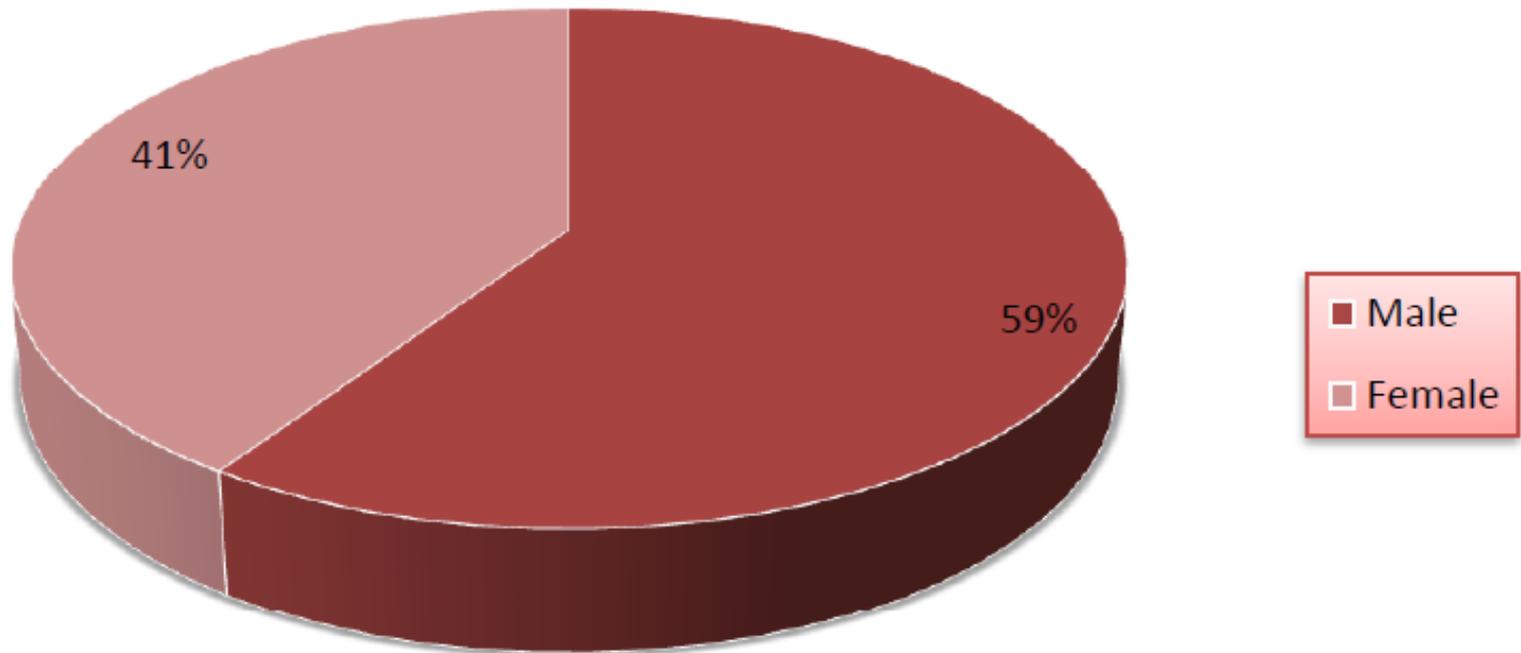
# **RESULTS AND OBSERVATION**

## Age distribution of the Patients



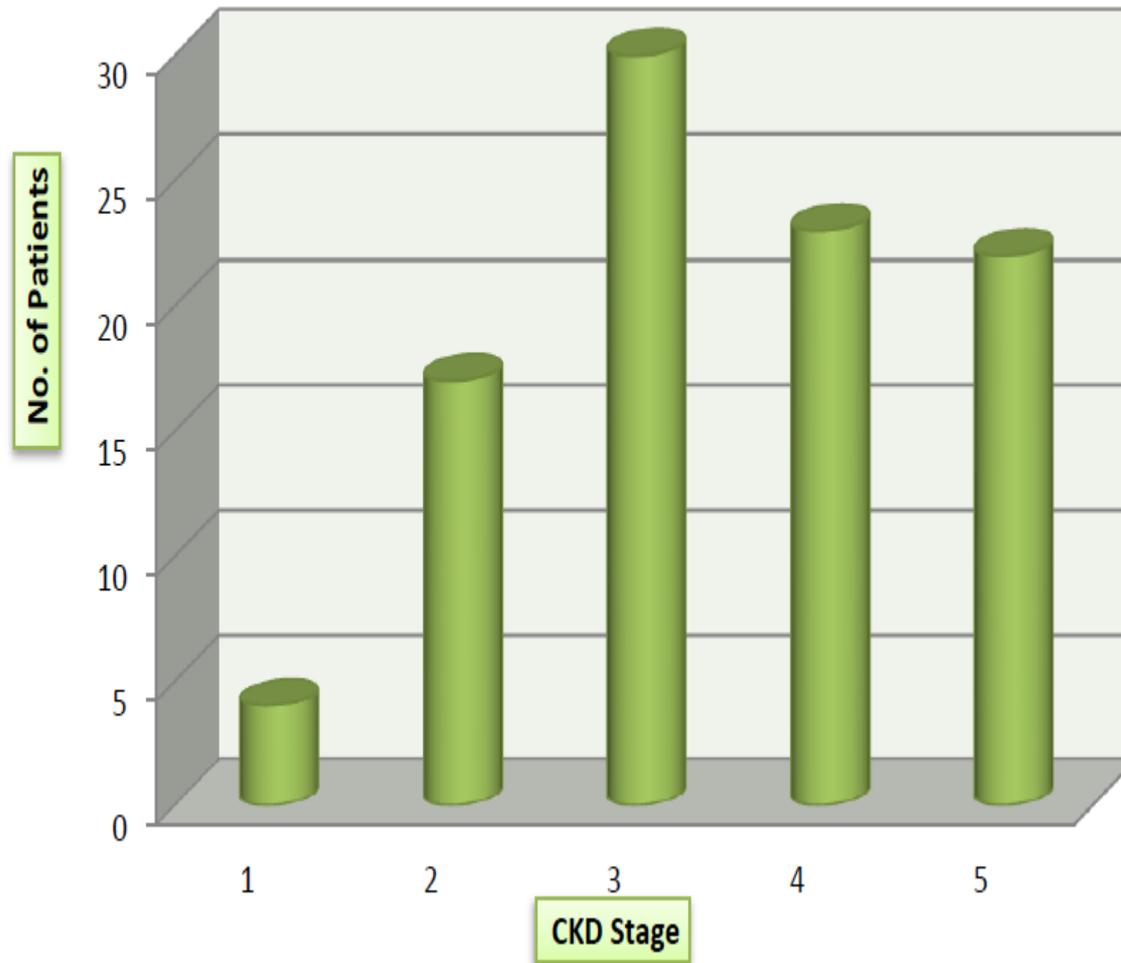
The age of patient were ranging from 35 to 80 years. Majority 31(32.3%) patients were in age group of **41-50**years.

## Gender distribution of the Patients



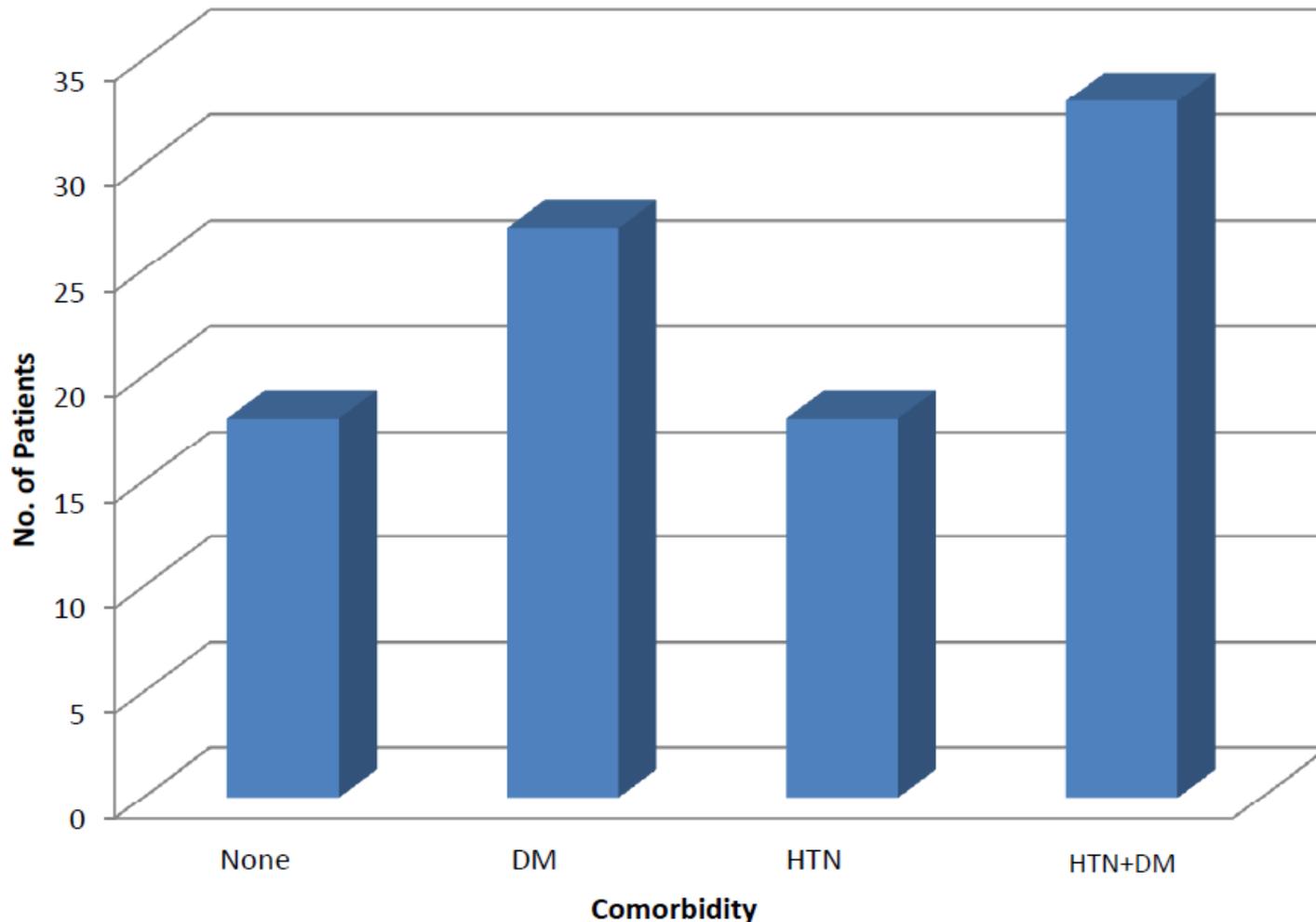
In our study there was **male preponderance** with male to female ratio 1.46.

## CKD Stage wise distribution of the Patients



In present study 4(4.2%) patient were in stage 1, 17(17.7) patient were in stage 2, **30(31.3) patient were in stage 3**, 23(24%) were in stage 4, 22(22.9%) were in stage 5 CKD.

# CKD with Comorbidity

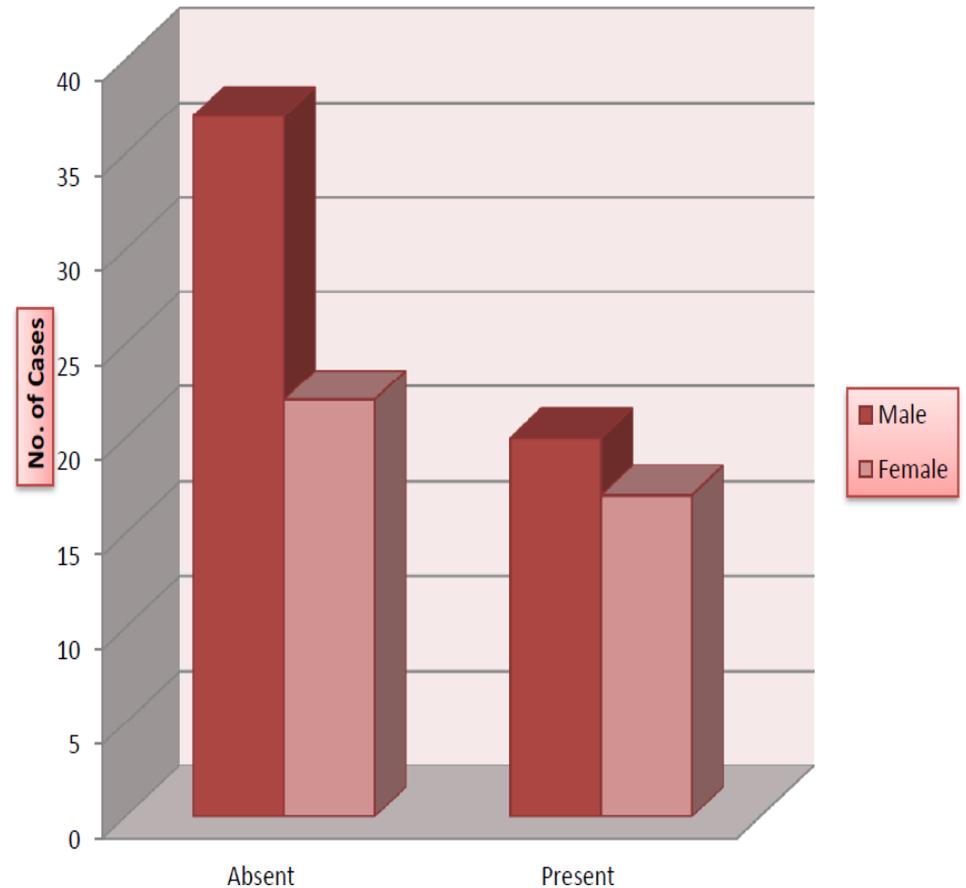
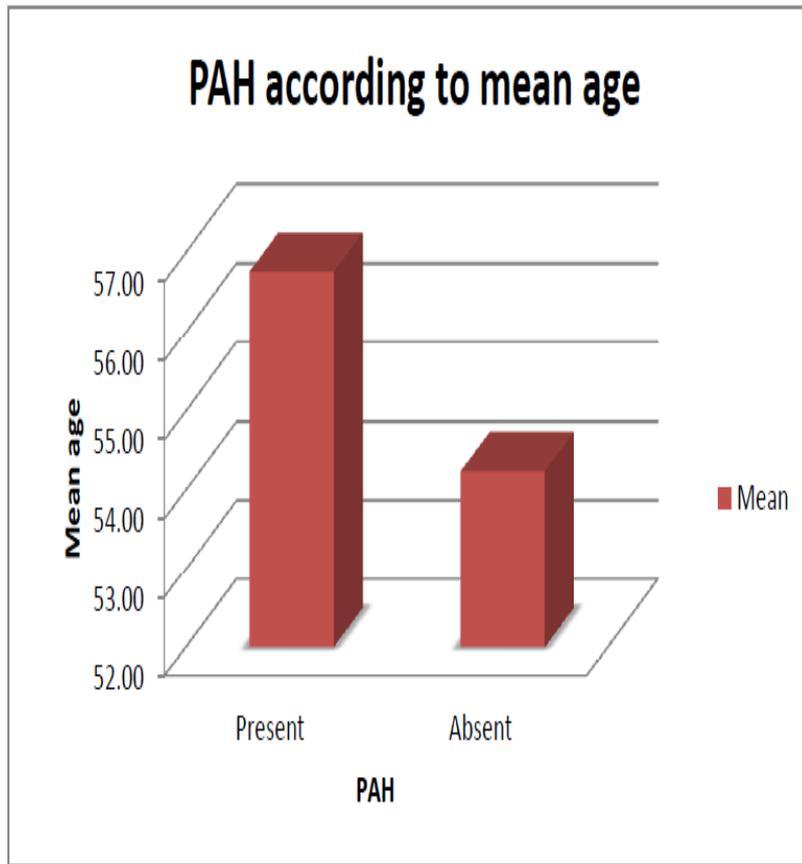


**33(34.4%) patients were both diabetic and hypertensive. 27(28.1%) patients were only diabetic and 18(18.8%) were only hypertensive. Total diabetic patients were 60 and total hypertensive patients were 51.**

# PAH distribution of the Patients

PAH	Frequency	Percent
Absent	59	61.5
Present	37	38.5
Total	96	100.0

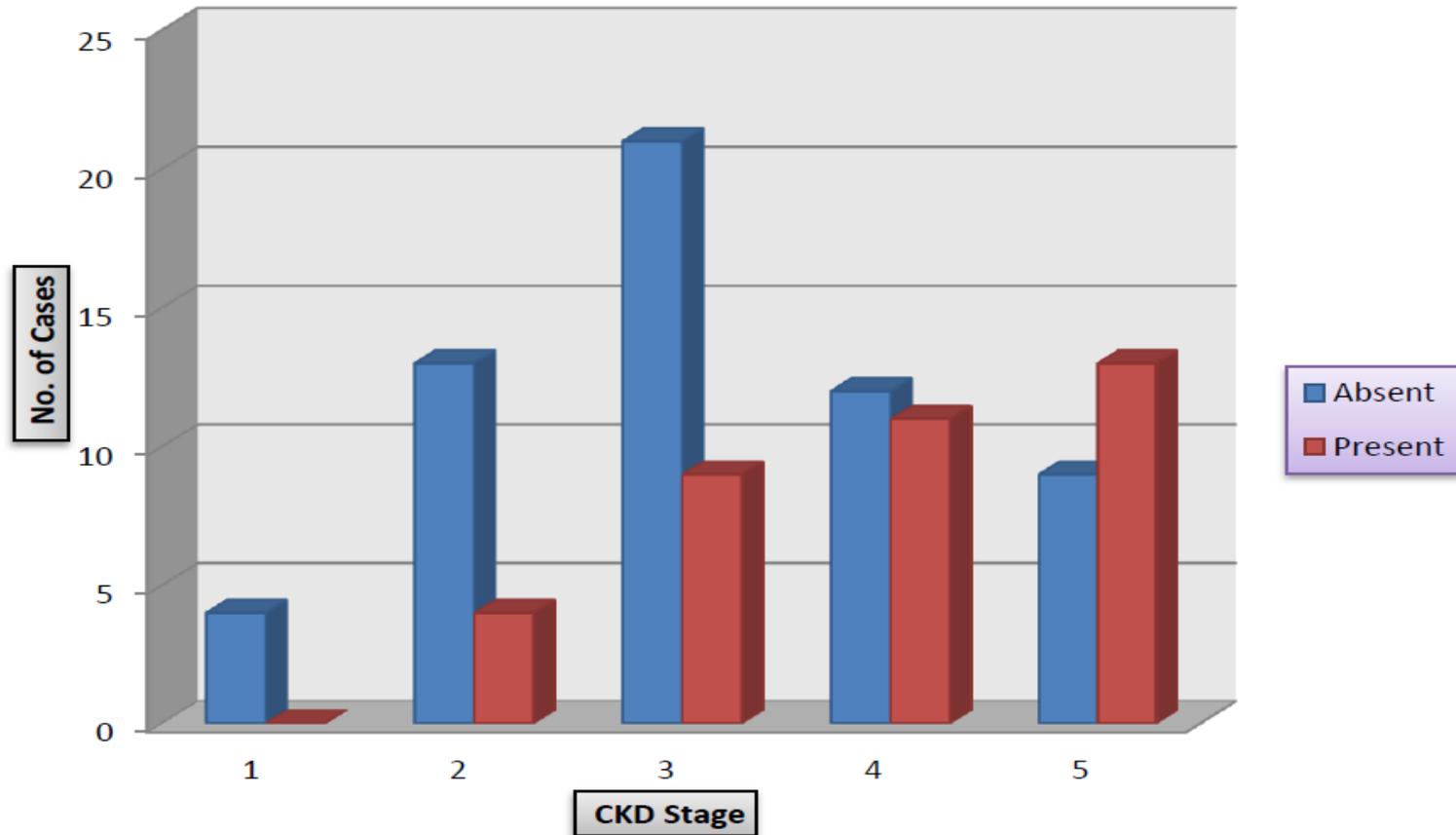
In present study pulmonary arterial hypertension was present in **37(38.5%)** patients



In present study mean age of patients having PAH were **56.76 ± 12.339** year.

20(35.1%) out of 57 **male patients** PAH present and 17(43.6%) out of 39 female patients PAH present

## Distribution of the PAH according to CKD Stage



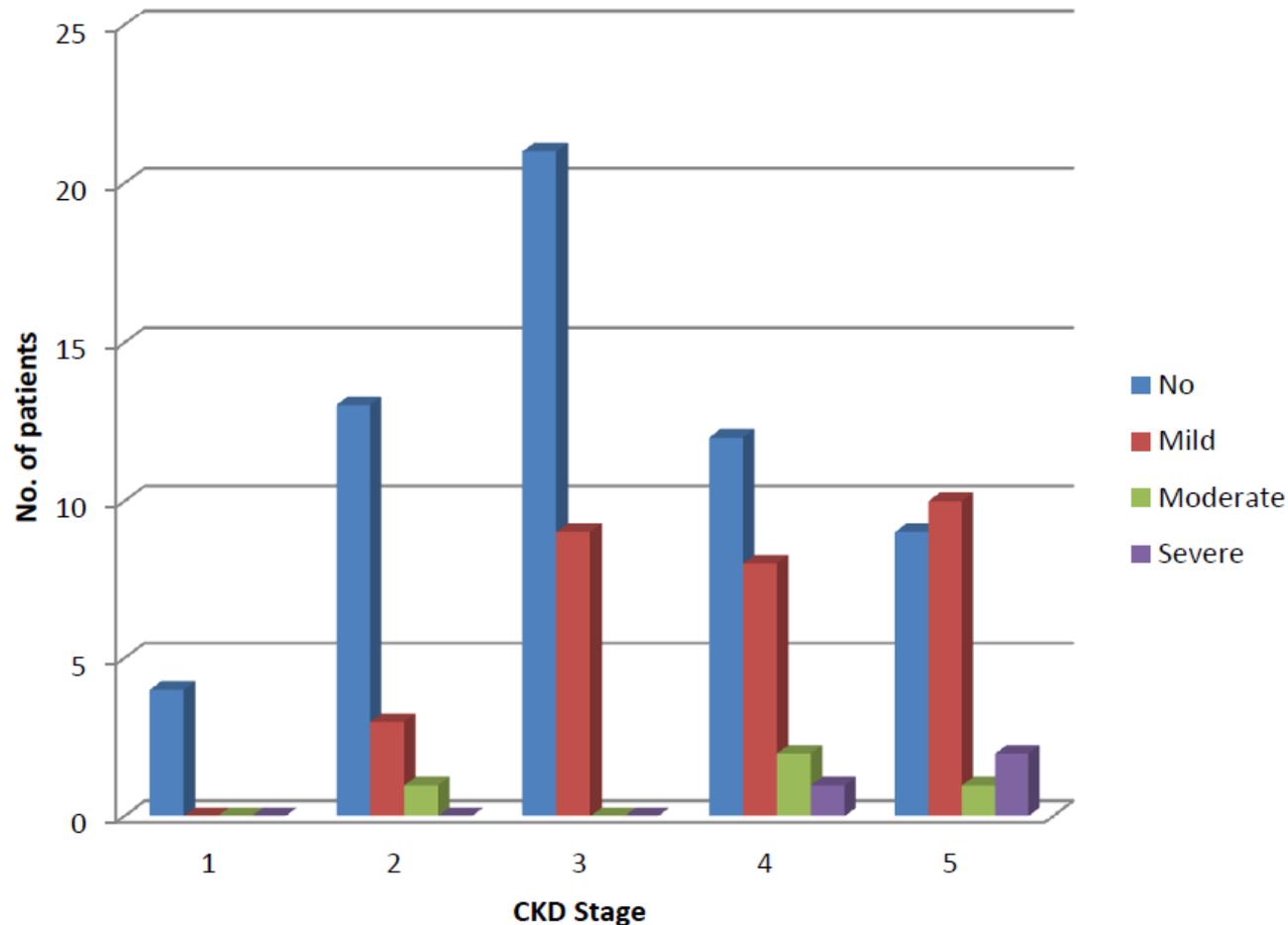
17 patients were in CKD stage 2 out of which PAH present in 4(23.5%)

30 patients were in CKD stage 3 out of which PAH present in 9(30.0%) .

**23 patients were in CKD stage 4 out of which PAH present in 11(47.8%)**

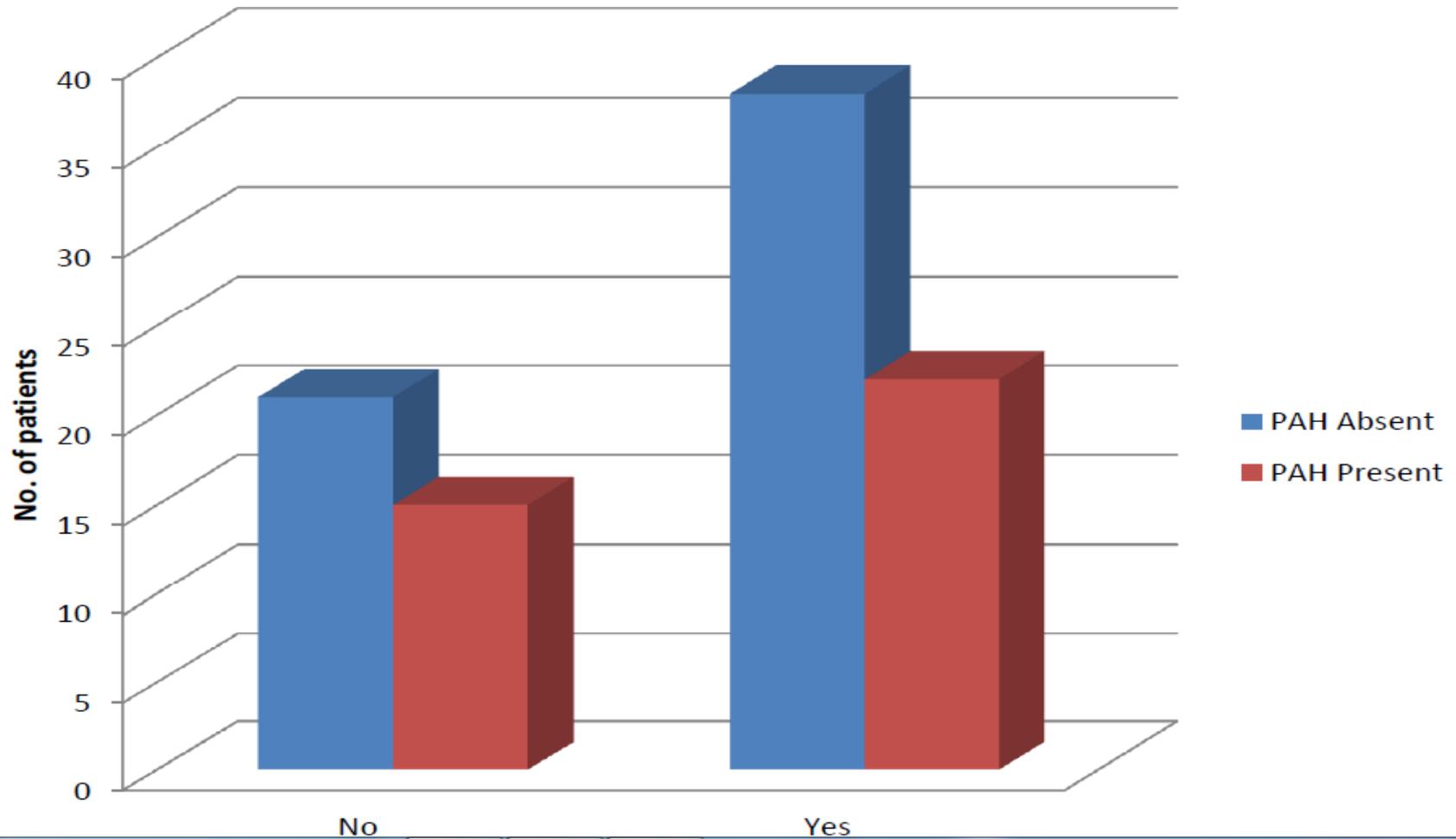
22 patients were in CKD stage 5 out of which PAH present in 13(38.5%)

# CKD stages and Severity of PAH



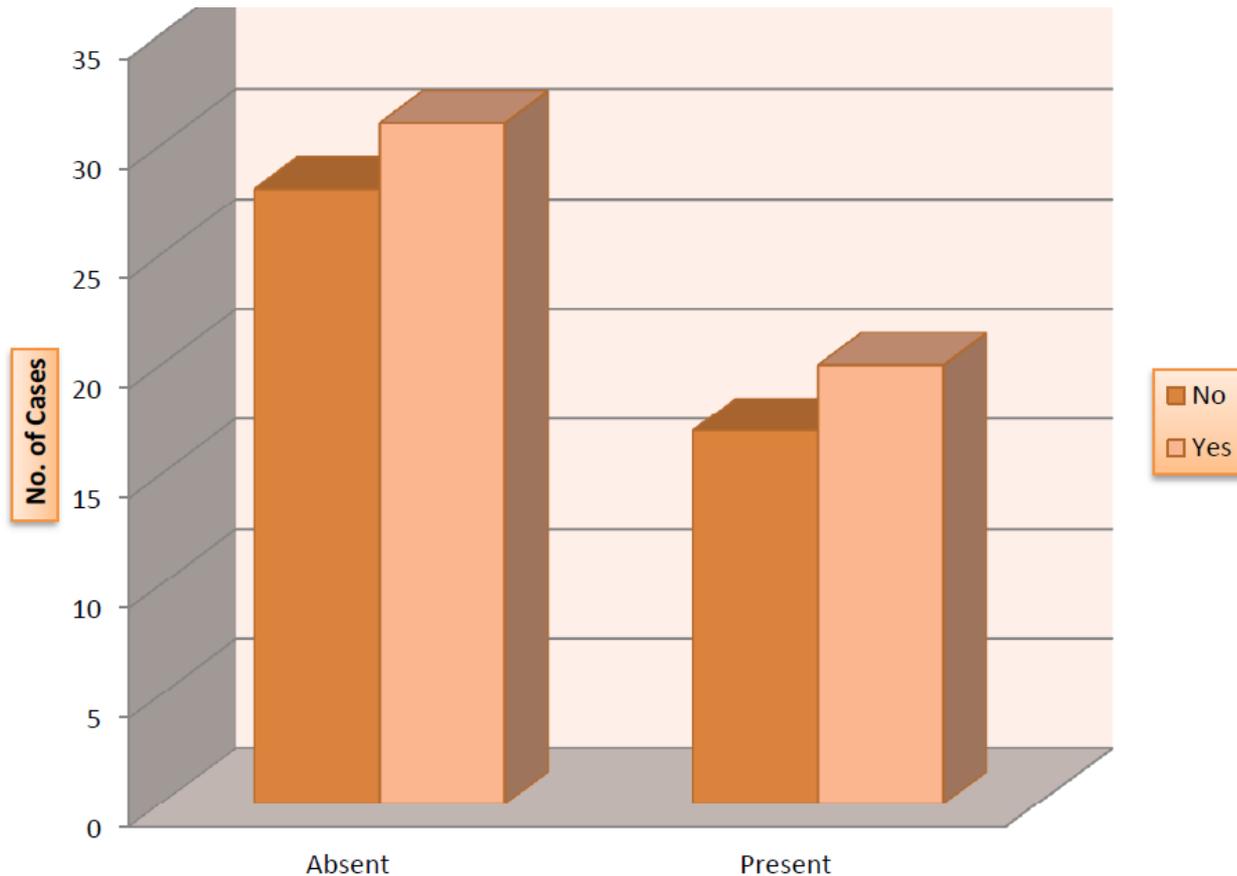
**As CKD stage progresses chances to develop PAH is high.**

# Distribution of PAH according to DM



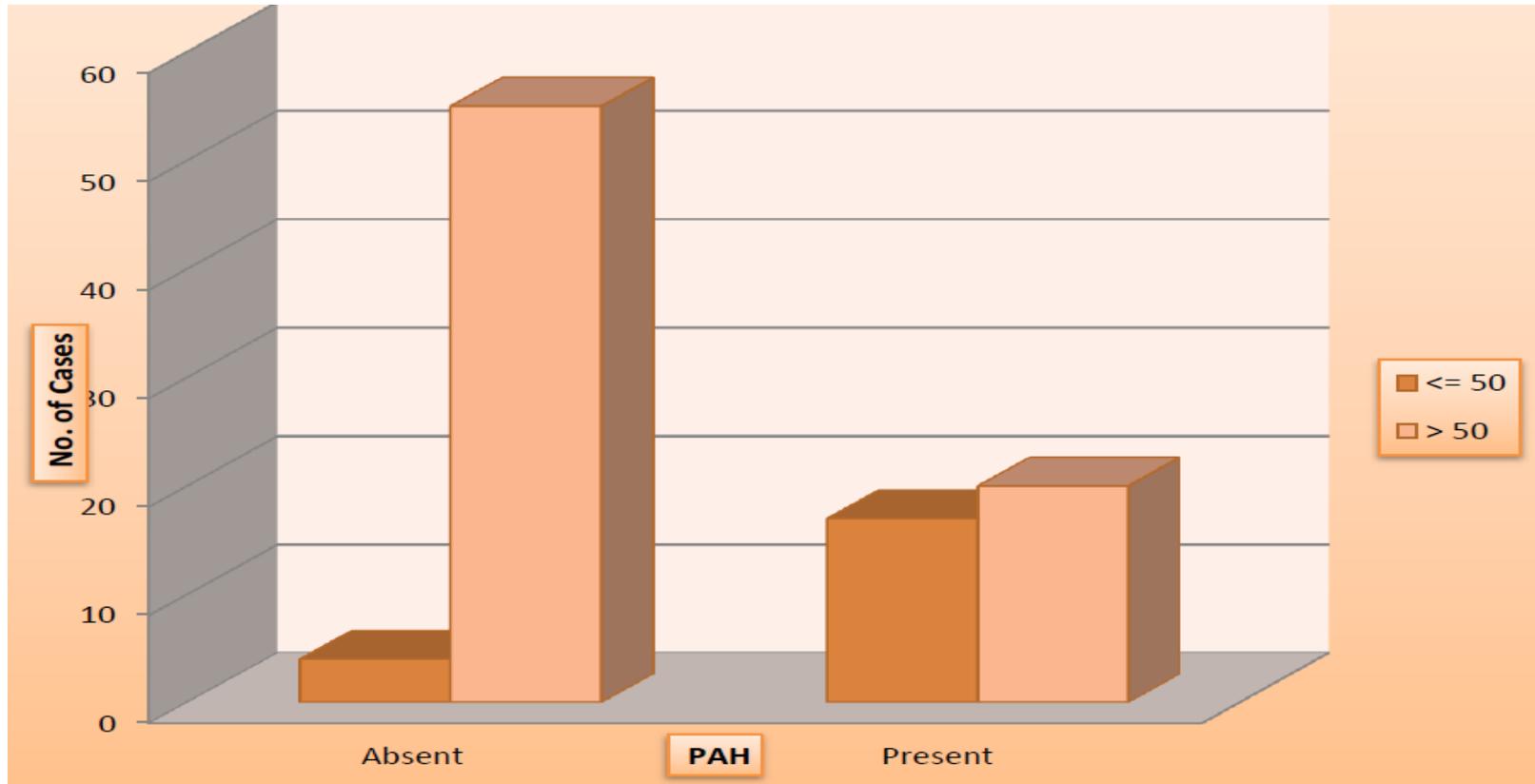
In present study **60 patients** were diabetic out of which **22(36.70%)** have PAH

# Distribution of the PAH according to HTN



**PAH were present in 20(39.2%) in 51 hypertensive patients.**

## Distribution of the PAH according to LVEF (%)



**21 patients have LVEF less or equal to 50%, out of which PAH present in 17(81%).**

# Distribution of the PAH according to LVH

LVH	PAH		Total
	Absent	Present	
no	45	11	56
	80.4%	19.6%	100.0%
yes	14	26	40
	35.0%	65.0%	100.0%
Total	59	37	96
	61.5%	38.5%	100.0%

**LVH present in 40 patients out of which PAH present in 26(65.0%)**

**Table 17-Mean eGFR according to PAH**

PAH	No	Mean EGFR (ml/min/1.73m <sup>2</sup> )	Std. Deviation	t	p
Present	37	24.43	17.846	3.430	0.001
Absent	59	40.98	25.703		

**Mean eGFR of patients having PAH was 24.43 ± 17.846ml/min/1.73m<sup>2</sup>**

# CONCLUSION

- Mean age with SD in our study is  $55.21 \pm 10.454$  years.
- Prevalence of PAH in CKD patients is 37( 38.5%). There is no significant difference between male and female.
- Diabetes mellitus is most common cause of chronic kidney disease followed by hypertension. Correlation of DM and HTN with PAH was found to be insignificant.
- As CKD progresses from stage 1 to 5 chances to develop PAH is high.

- Significant correlation found between CKD stages and severity of PAH.
- LVD is also increased in patients with CKD. If left ventricular dysfunction is more, chances to develop PAH is more. Now, this PAH can be due to the effect of the CKD.
- Left ventricular hypertrophy also increases the chances to develop PAH.

- Mean eGFR of patients with PAH is low as compare to patients without PAH.
- Pulmonary artery hypertention and its complications are important cause for cardiovascular morbidity and mortality in ckd patients and therefore should be evaluated early .

# LIMITATION

- Sample size of the study was small.
- Right heart catheterization, which is accepted as the gold standard was not done.
- PCWP was not measured. So PAH is due to the effect of the CKD per se or due to the result of the LVD occurring from CKD cannot be conclusively determined.
- The patient in this study are only those admitted in hospital with CKD. Therefore the actual prevalence of PAH in CKD patients may be quite different.

**THANK YOU**