

# **Study of Bone metabolic changes in Chronic Liver Disease with Portal Hypertension**

Authors :Dr.Anugrah Dubey<sup>1</sup>,Dr.Aadish kumar  
Jain<sup>2</sup>,Dr.S.B.Gawarikar<sup>3</sup>,Dr.Manas Patidar<sup>4</sup>,Dr.Ashish Sharma<sup>5</sup>

Department of Medicine

R.D.Gardi Medical College,Ujjain,M.P.

# Introduction

- Chronic liver disease (cirrhosis of liver) with portal hypertension is a worldwide problem with increased prevalence of Hepatitis B & C
- Marked Increase of alcohol consumption in India 2007 onwards
- Complicating feature of cirrhosis of liver is portal hypertension leading to ascites and bleeding esophageal varices

- Liver plays important role in vitamin D and bone metabolism.
- It is expected that in CLD there is deficiency of vitamin D which can affect serum calcium, phosphorus, bone mineralization and metabolism.
- Experimental studies in rat demonstrated that in liver diseases .hepatic 25 hydroxylation of vitamin D is not impaired and previous human studies shows conflicting results.

# **Aims and Objectives:-**

- To study serum Calcium, serum Phosphorous, serum Vitamin D and Serum intact Parathyroid hormone levels in cases with Chronic liver disease with Portal Hypertension
- To detect a correlation, if any of these bone metabolic minerals and calcium regulating hormones in cases of CLD with Portal Hypertension.

# Material and method

- This is an observational study carried out at R.D.Gardi Medical college, Ujjain, Madhya Pradesh after approval from ethical committee.
- Duration 1 year.
- 75 patients of chronic liver disease with portal hypertension were included in study undergone detailed history followed by biochemical and radiological testing.
- Data are entered in pretested proforma and results entered in tabulated and graphical forms

# Inclusion criteria

1. Patient of chronic liver disease with clinical evidence of Portal Hypertension, irrespective of etiology.
2. Included both male and female of Age 12 years or more.

# Exclusion criteria

Patients with

- CRF
- Post menopausal females.
- Known cases of Cushing syndrome or steroid abuse.
- Known cases of Thyroid and parathyroid disorder.
- Patients not able to give written consents.
- Patients on drugs involving calcium metabolism.

# Investigations

- Complete hemogram
- RBS
- Blood urea and serum creatinine.
- Liver function test
- Serum Calcium, Sodium and Potassium, Phosphorus
- Urine routine and microscopy.
- USG abdomen
- Vitamin D
- iPTH



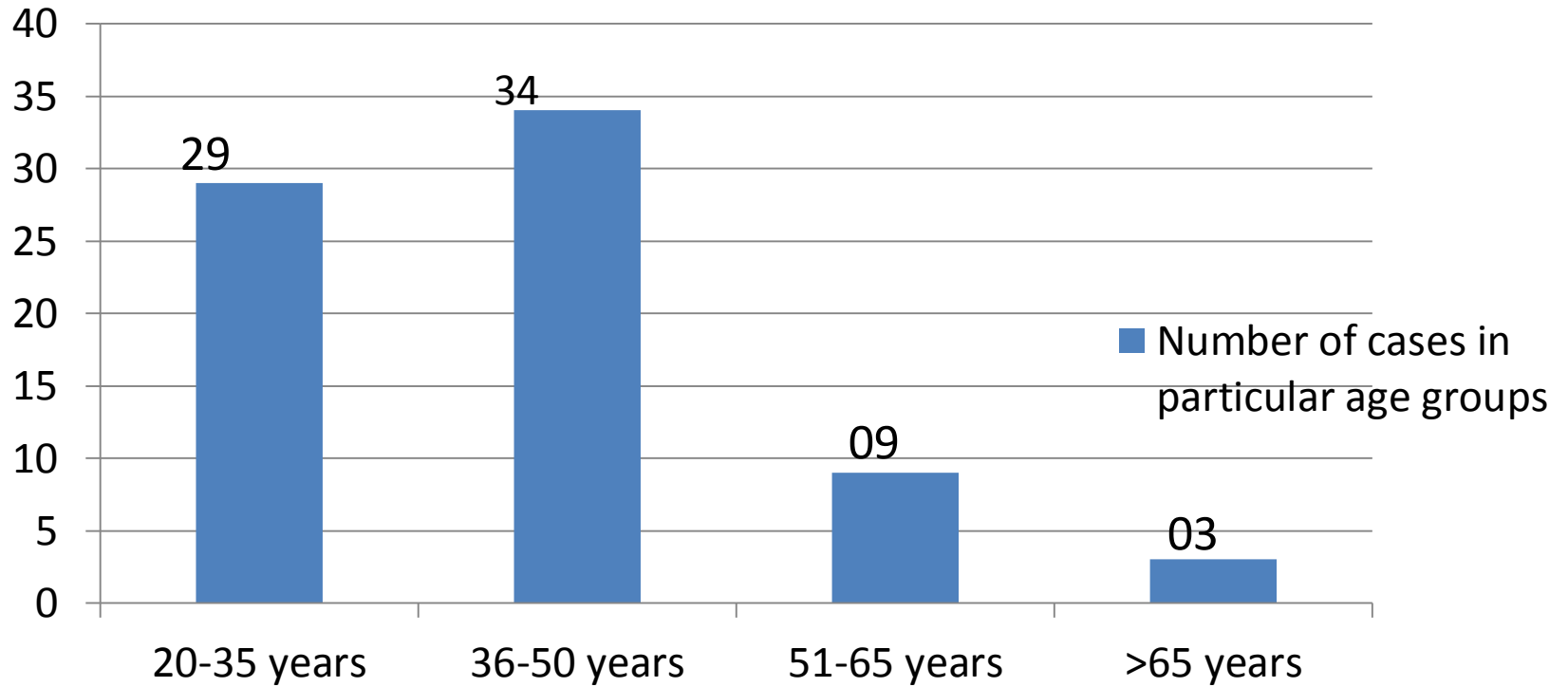
# Statistical analysis

- SPSS 23 software is used for statistical analysis
- For comparison chi square and t test was applied.
- p value of 0.5 is considered significant.

# Observation and Results

# Age distribution

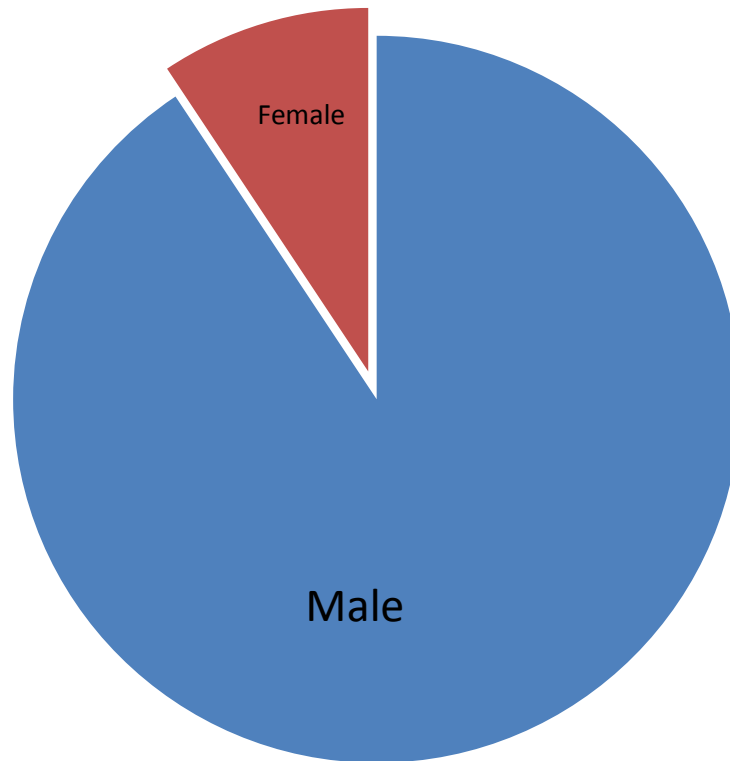
Y axis –number of cases  
X axis-age groups, Total 75 cases



# Gender distribution

Male -68(90.7%),female 07(9.3%) ,Total 75(100%)

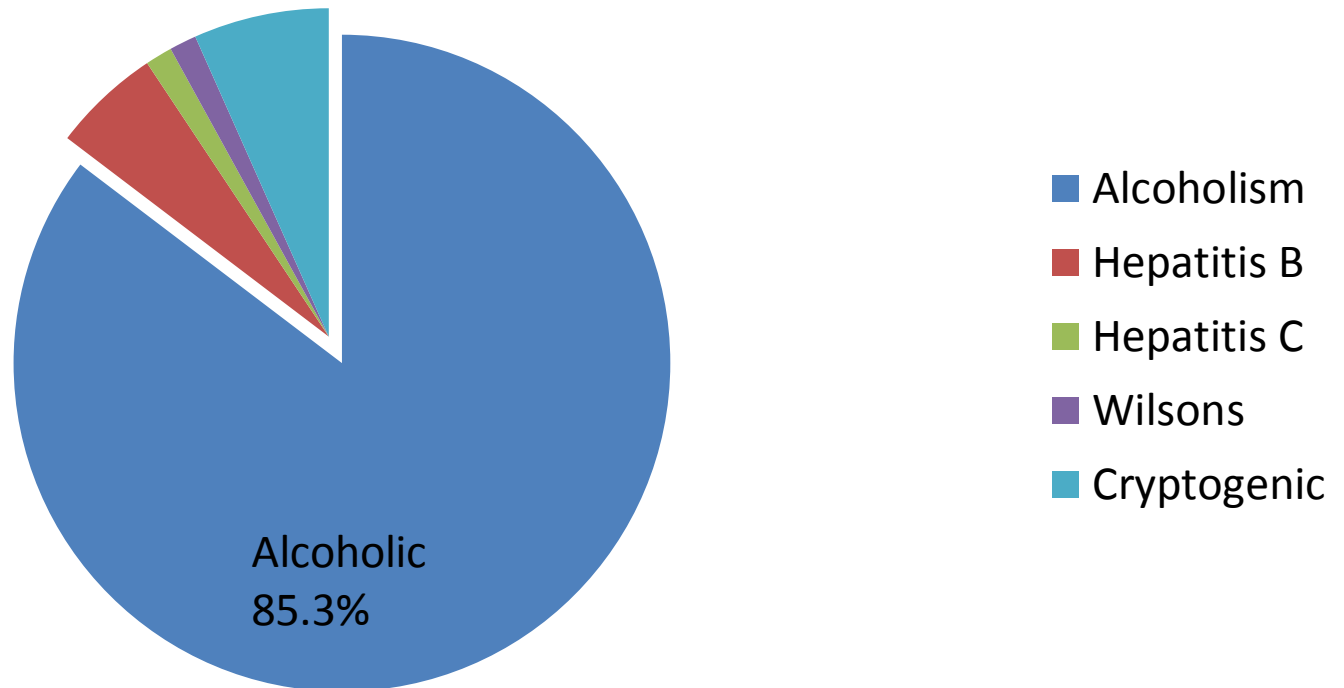
Male:Female = 9.71:1



■ Male  
■ female

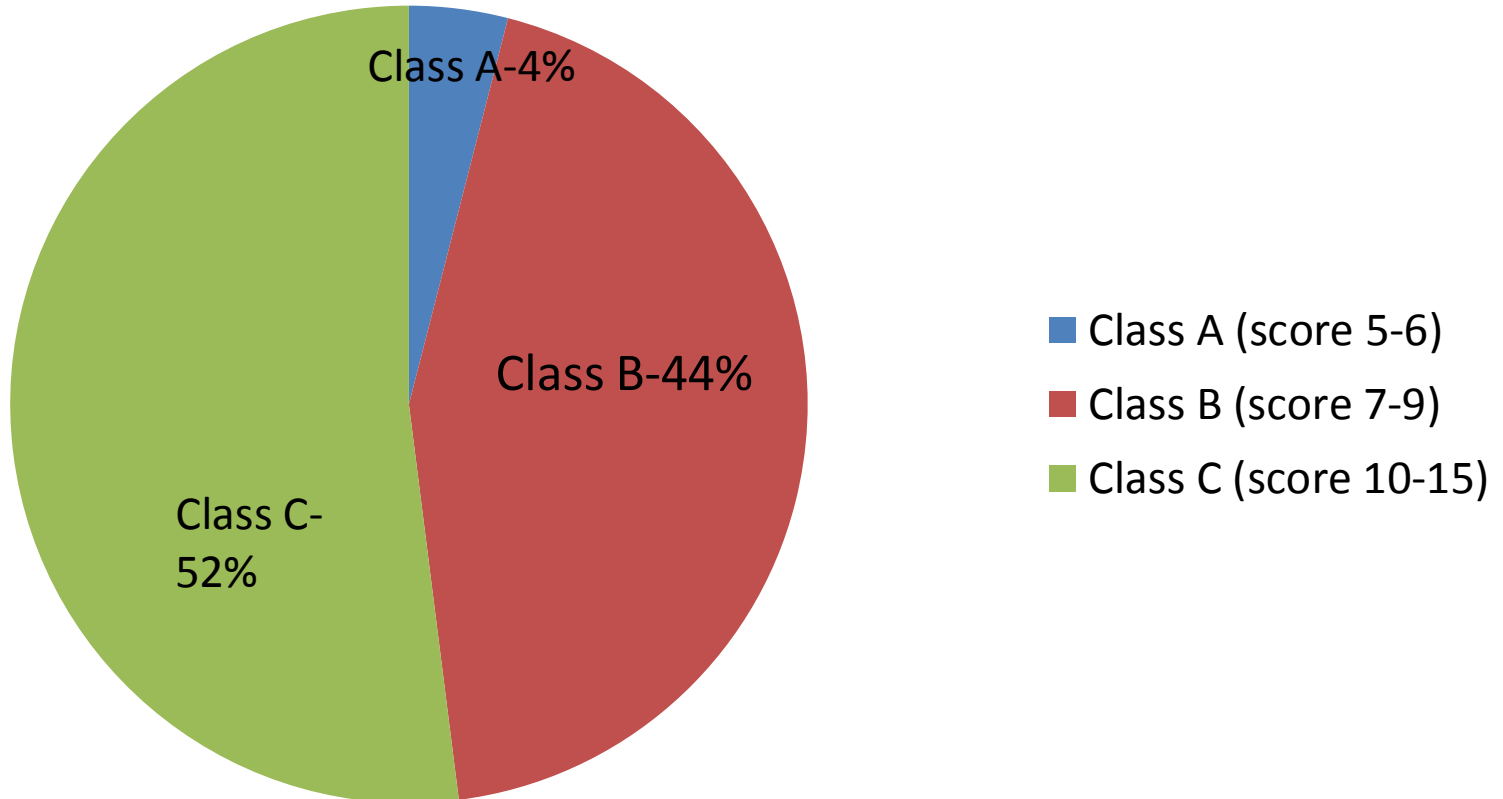
# Etiology

**Alcoholic -64(85.3%),Hep B-04(5.3%),Hep C-01(1.3%),Wilson's disease-01(1.3%),Cryptogenic -05(6.7%)**

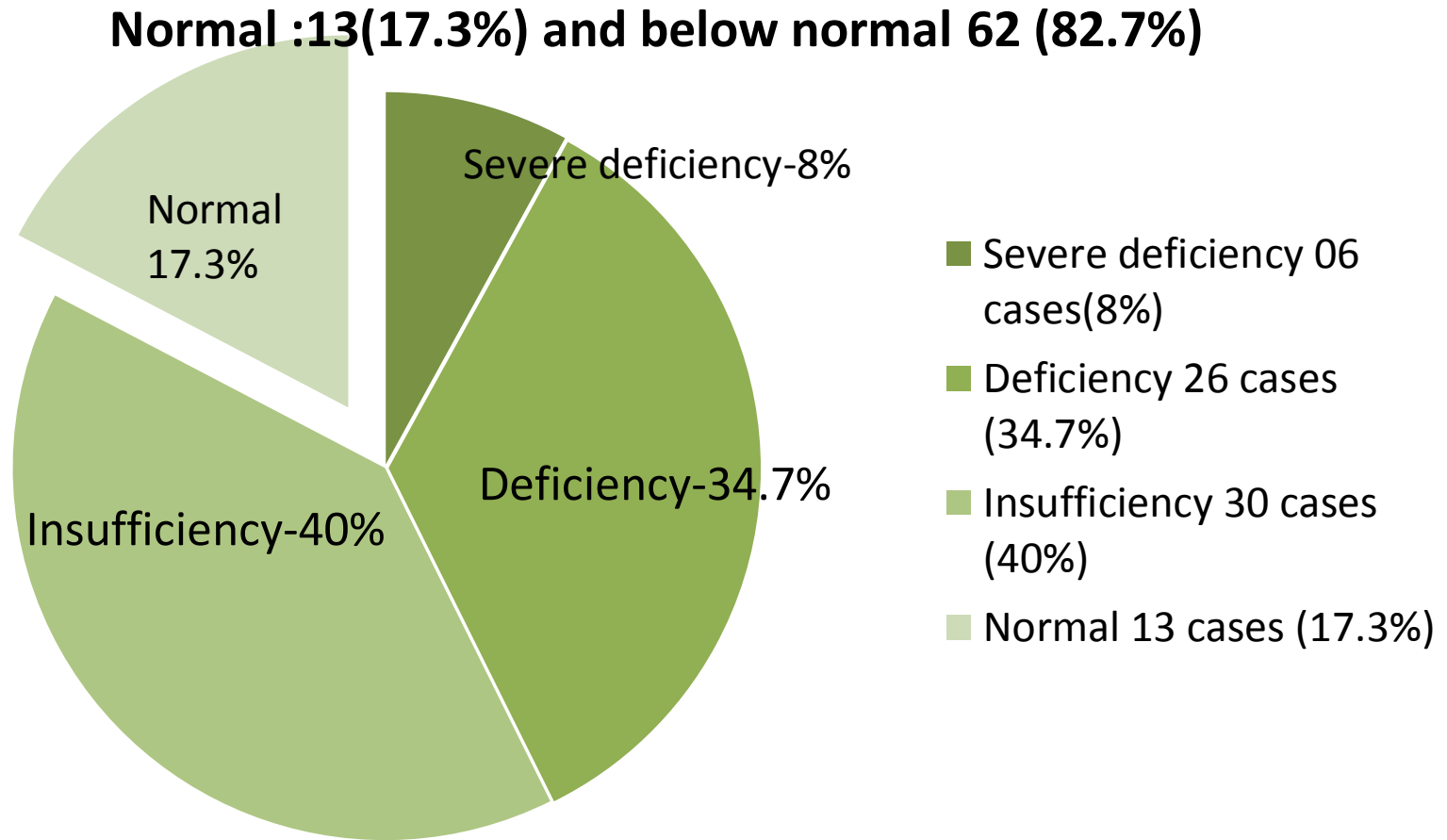


# Child Pugh class distribution

Class A-03(04%),class B-33(44%),class C-39(52%)



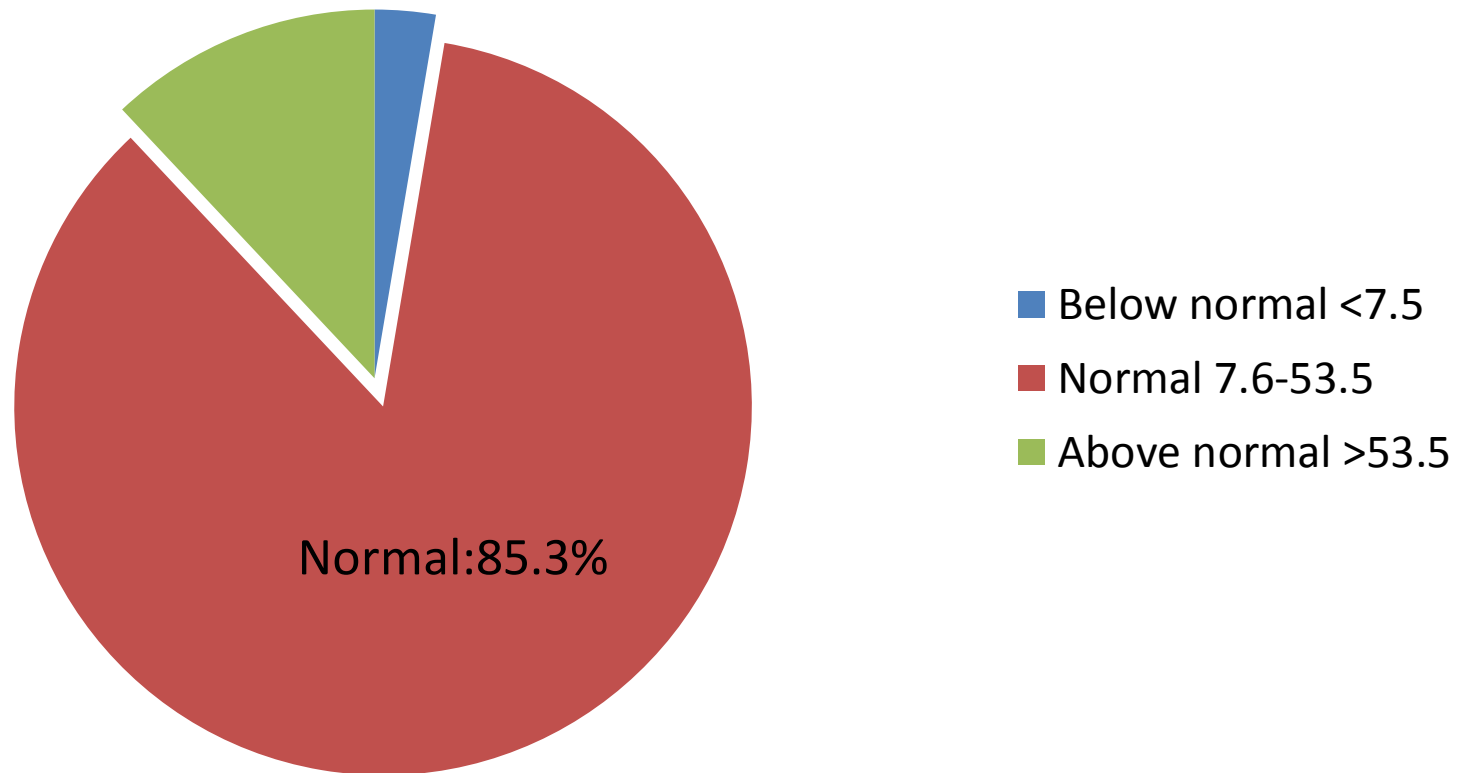
# Distribution of Vitamin D(ng/ml) and its severity.



Severe deficiency <10 ng/ml, deficiency <20 ng/ml, Insufficient 20-30 ng/ml  
normal 30 -100 ng/ml

# Serum intact parathyroid hormone(pg/ml) distribution

Below normal :02(2.7%), normal: 64(85.3 %),  
above normal :09(12%)

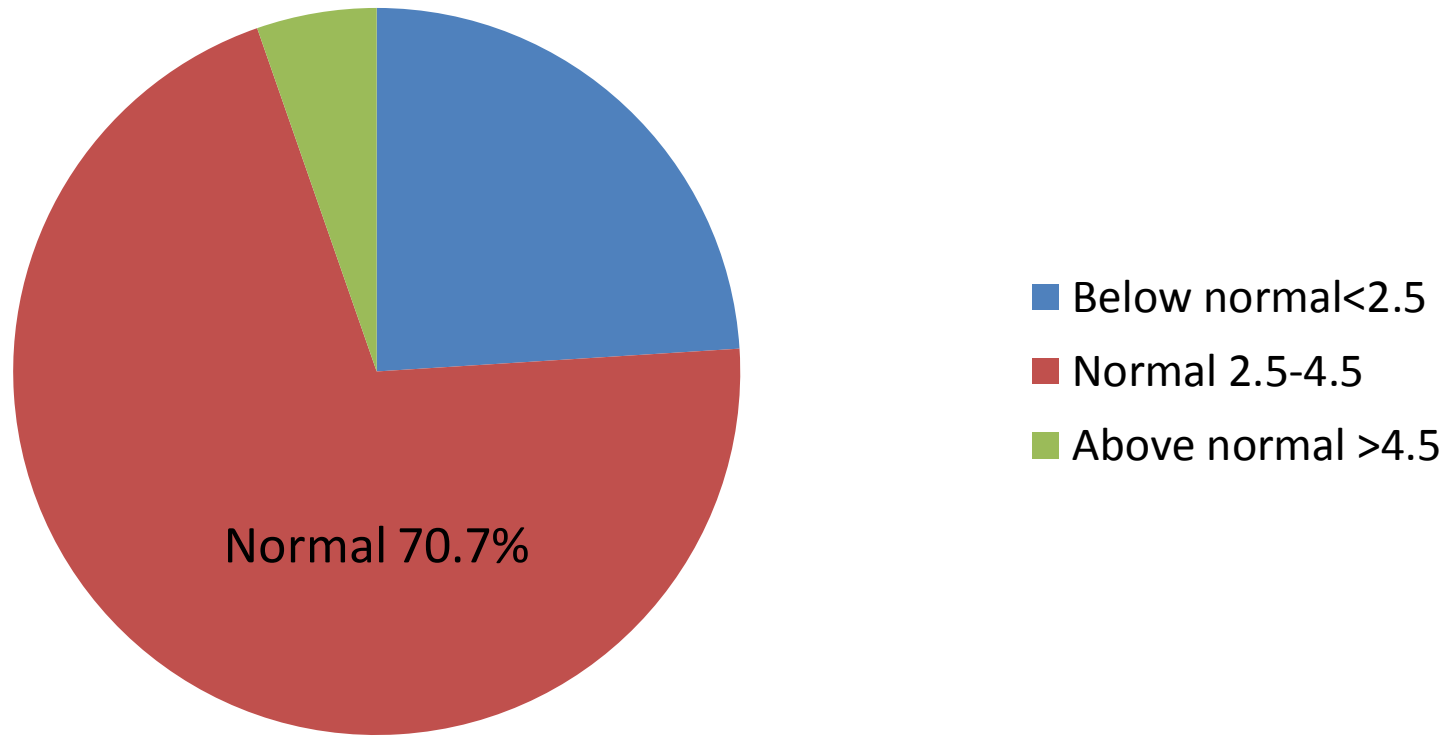


Normal range of intact PTH at our institute is 7.5 -53.5 pg/ml



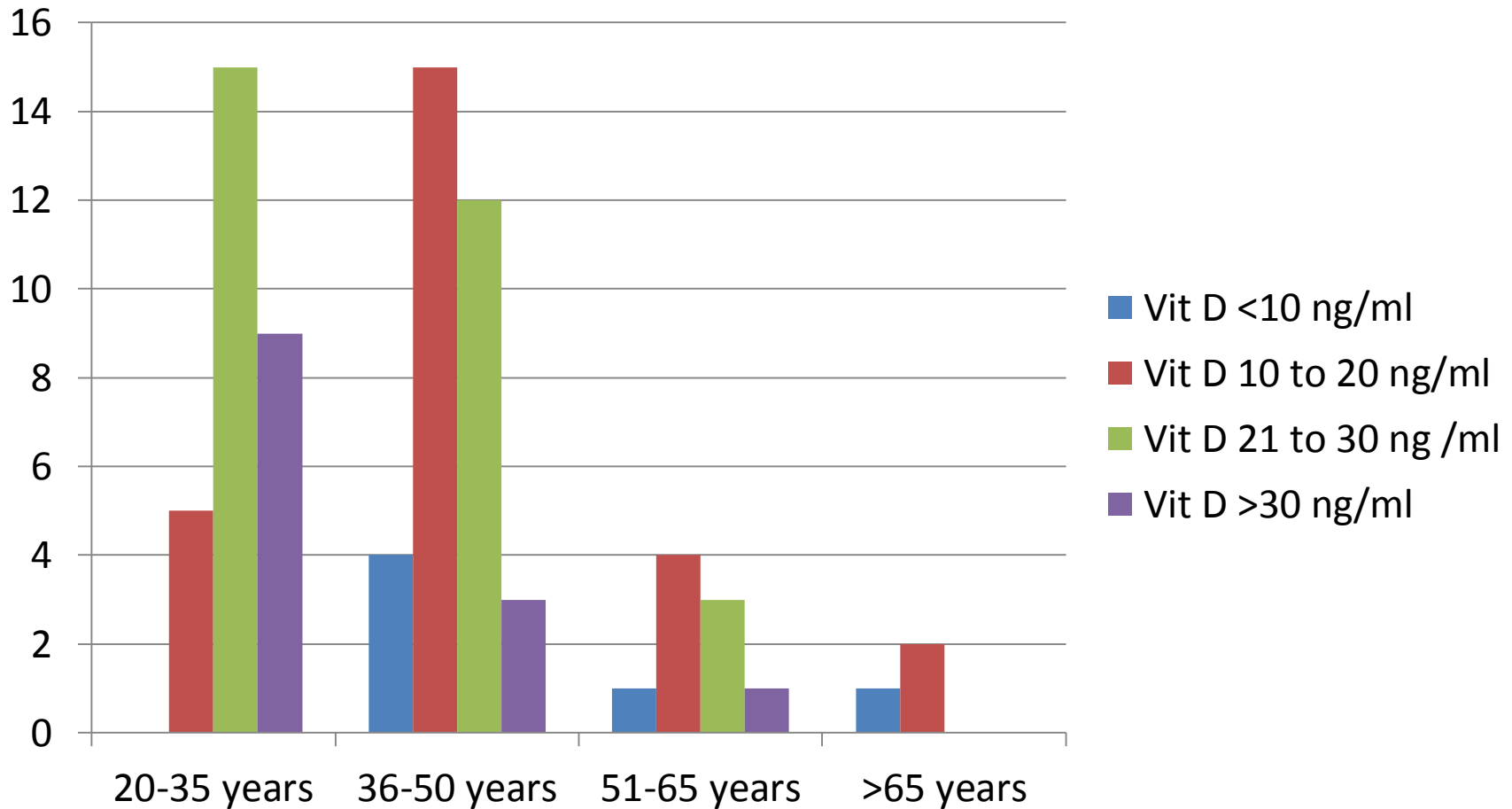
# Serum phosphorus levels (mg/dl)

**Below normal:18(24%),normal 53 :(70.7%),  
above normal : 04(5.3%)**

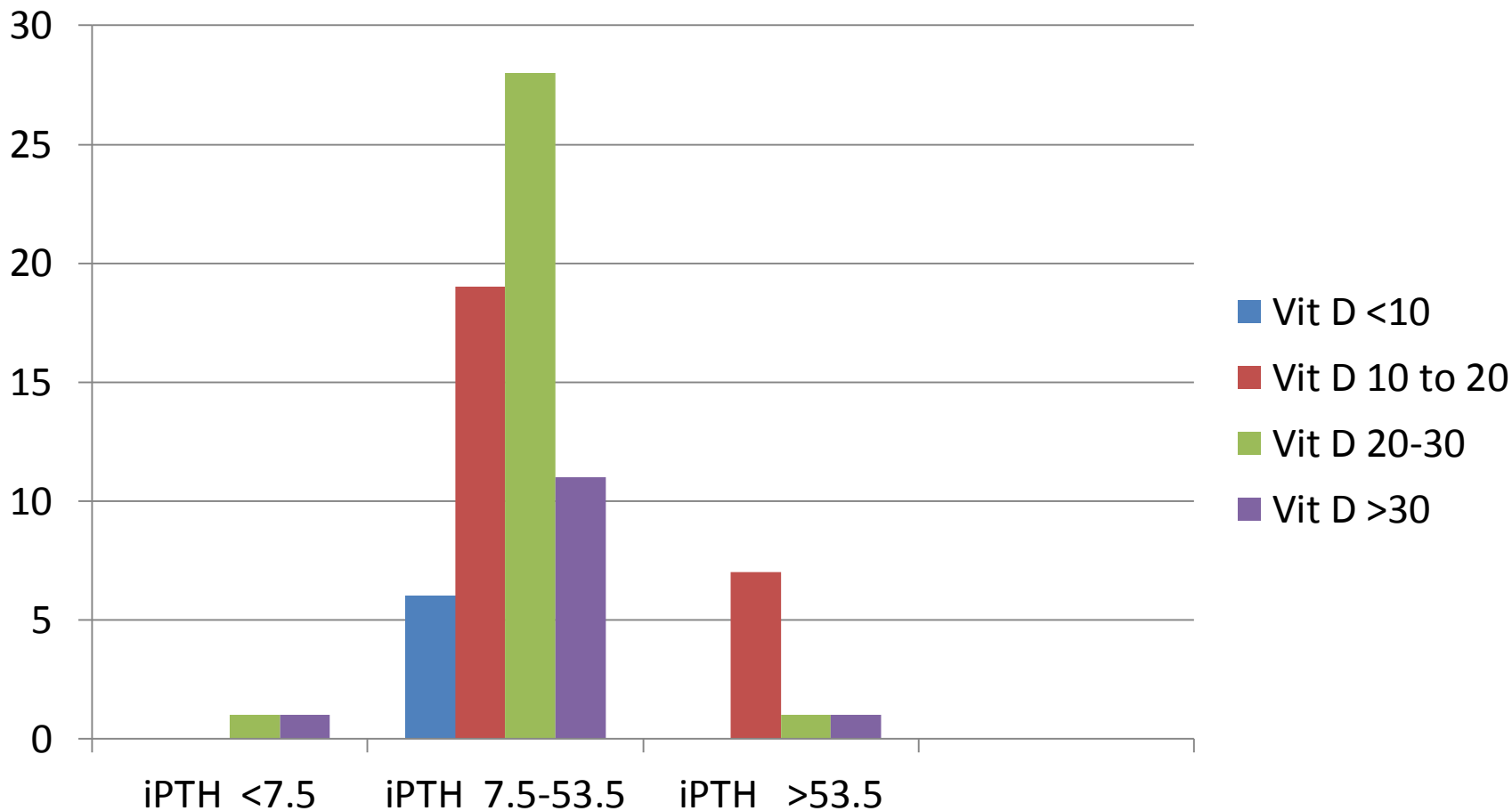


Normal range of serum phosphorus 2.5-4.5 mg/dl

# Distribution of serum vitamin D (ng/ml) according to age groups

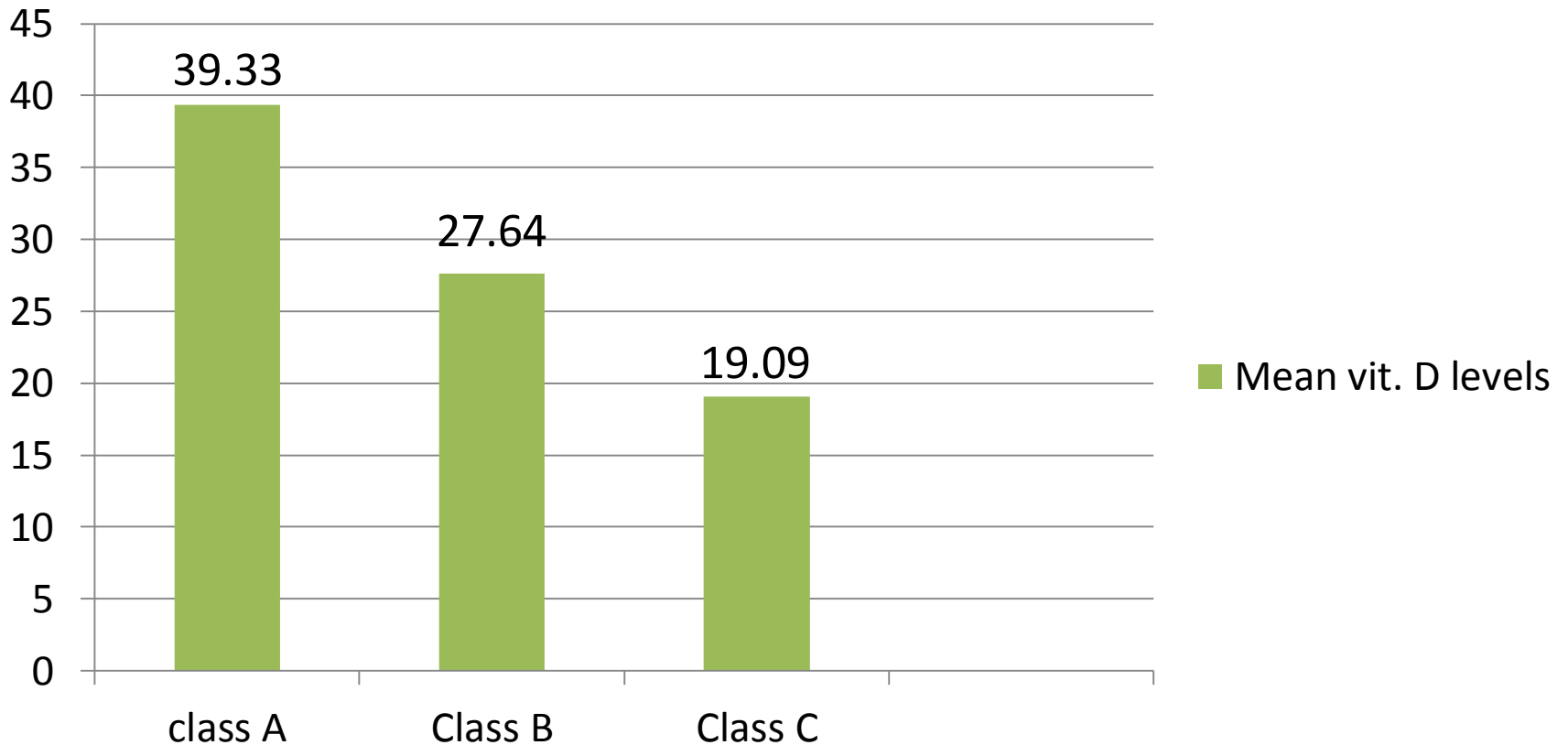


# Distribution of Serum vitamin D (ng/ml) with iPTH (pg/ml) levels



# Distribution of Child Pugh class with mean Vitamin D levels

Mean Vit. D levels (ng/ml)



# Conclusion

- Male preponderance in CLD with portal hypertension Male:Female 9.71:1
- Most common Etiology is Alcoholism
- Most common age group affected 35-50 years
- Normal Vit D levels found in 13 cases (17.3%)  
,below normal levels 62 cases( 82.7%)

- Negative correlation between serum vitamin D and child pugh score classes(severity).
- Negative correlation of vitamin D with age of patient.
- No correlation can be established in our study between Serum Calcium ,Phosphorus and intact Parathyroid Hormone and Vitamin D

# Limitations of this study

- Study on larger population is required to verify the results.
- This study is an observational study, a case control study can more accurately compare the results.

# Suggestions

- Based on results of this study
  1. Estimation of vitamin D and Parathyroid Hormone in patients of CLD with Portal Hypertension is important.
  2. Supplementation of Vitamin D should be considered ,as it may decrease the risk of co morbidities attributable to vitamin D deficiency.



**Thank You**