

Pattern of Anemia in Patients with Chronic Kidney Disease Admitted in a Tertiary Care Hospital

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Introduction

- Chronic Kidney Disease (CKD): irreversible deterioration in renal function
- It initially manifests: a biochemical abnormality
- Followed by loss of: excretory, metabolic, endocrine functions lost
- Lead to uremia

Rationale

- Anemia is **common** in CKD patients:
 - Important clinical problem
 - Poor quality of life
- Iron deficiency anemia is **prevalent** in Bangladesh
- Findings may help **plan a larger study** in Bangladesh

Objectives

- To find out the **pattern of anemia** in patients with Chronic Kidney Disease (CKD)

Specific Objectives:

- Frequency of **microcytic hypochromic** anemia
- Frequency of **normochromic normocytic** anemia
- Frequency of **combined** deficiency anemia



Methodology



Study Design

Cross-Sectional Study

Study Place, Period, Population

- Place of Study: Departments of Nephrology and Medicine, Dhaka Medical College Hospital, Dhaka
- Period of Study: June, 2017 to December, 2017
- Sample Size: 50 Cases

Selection Criteria

Inclusion criteria

- **Clinically anemic**
- Patient admitted in Medicine ward
 - Clinical features consistent with CKD
 - Investigation findings consistent with CKD

Selection Criteria

Exclusion Criteria

- **Not clinically anemic**
- Unwilling to participate
- **Suffering from systemic infections/
malignancies**
- **Iron therapy: > one month.**
- Other illnesses that may alter parameters

Operational Definitions: CKD

- Three or more months
- Structural or functional abnormalities
- With or without decreased GFR
- Pathologic abnormalities or markers
 - Abnormalities in blood
 - Urine
 - Abnormalities in imaging tests
 - $\text{GFR} < 60 \text{ ml per minute per } 1.73 \text{ m}^2$ ¹

¹Fernandez-Rodriguez AM, Guindeo-Casasus MC, Molero-Labarta Tetal.
Diagnosis of iron deficiency in chronic renal failure. Am J Kidney Dis
1999; 34:508-513

Study Method

- **Sampling Method:** purposive sampling
- All patients with clinical features of CKD admitted in medicine wards who:
 - Satisfied inclusion and exclusion criteria
 - Informed written consent
 - Data processed and analyzed by Statistical Package for Social Science
 - **Level of significance: p value less than 0.05.**

Variables

- **Hemoglobin Percent**
- **Red Blood Cells Indices**
 - MCV
 - MCHC
 - MCH
- **Iron Profile**
 - Serum Iron
 - Total Iron Binding Capacity
 - Serum Ferritin

Data Collection and Ethical Considerations

- Informed written consent obtained after a brief of the study in Bangla
- Collected from the patients:
 - Interview
 - History Taking
 - Physical Examination
 - Investigations
- Answers kept confidential

Data Analysis

- Collection of information
- Data checked and verified for consistency
- Editing and coding
- Coded data directly entered using SPSS.
- Data cleaning validation and analysis: SPSS
- Graphs and Charts: SPSS
- Result presentation: tables and percentages

Results

Results

- Mean age of study cases: 55.8 years
- **Ranging from 19 - 85 years**
- **Gender distribution 33 male; 17 female**
- Patients suffering from:
 - **Normocytic normochromic anemia: 33**
 - Microcytic hypochromic anemia: 11
 - Combined deficiency anemia: 6
 - **Female patients suffering mainly from microcytic hypochromic anaemia**

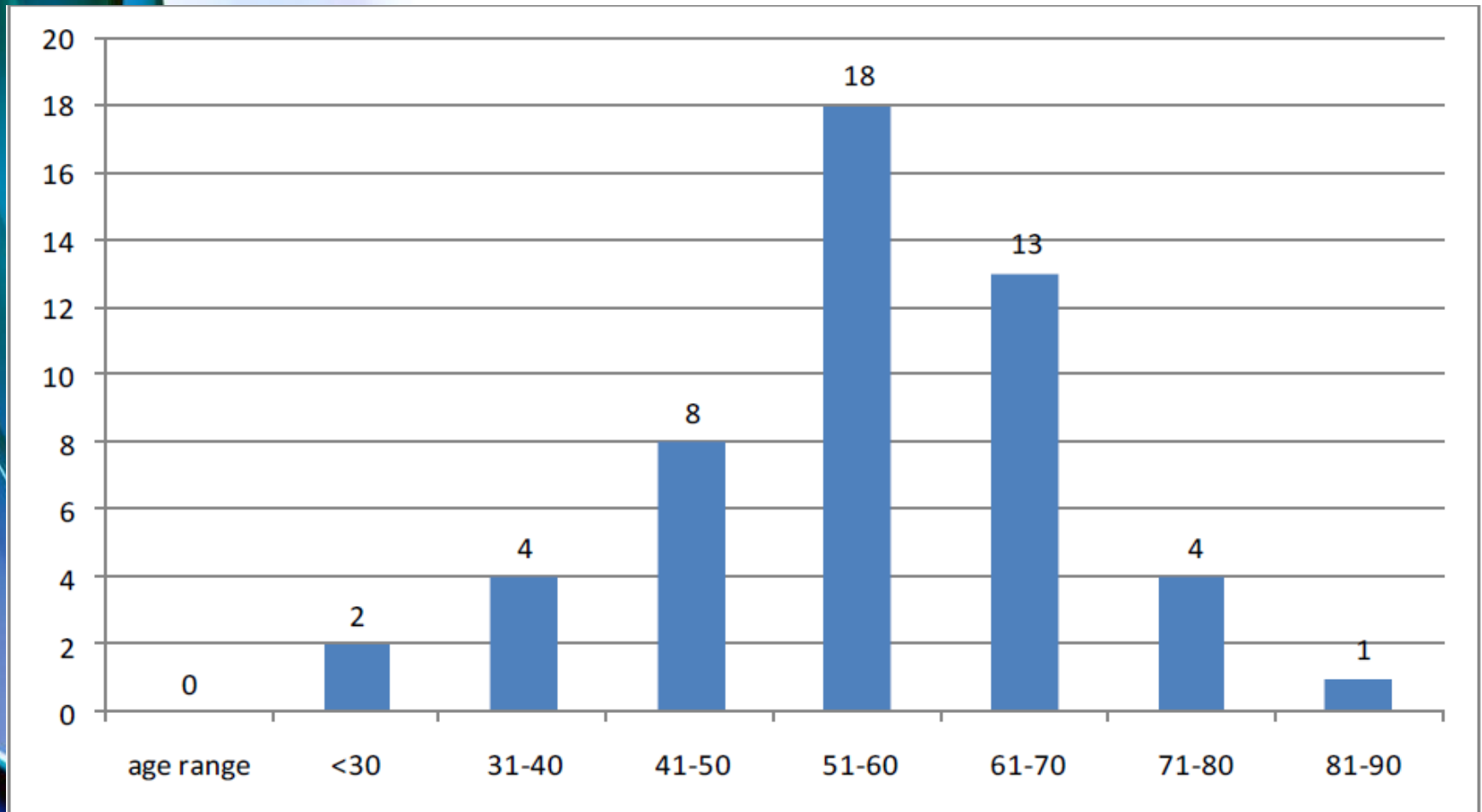
Demographic Table

Age		Occupation		Gender	
Age Range (Years)	Number of CKD patients	Name of the Occupation	Total Number	Male	Female
0-30	2	Government	5	4	1
31-40	4	Non-Government	6	4	2
41-50	8	Farmer	12	12	0
51-60	18	Business	7	7	0
61-70	13	Retired	6	5	1
71-80	4	Housewife	12	0	12
81-90	1	Others	2	1	1
Total	50	Total	50	33	17

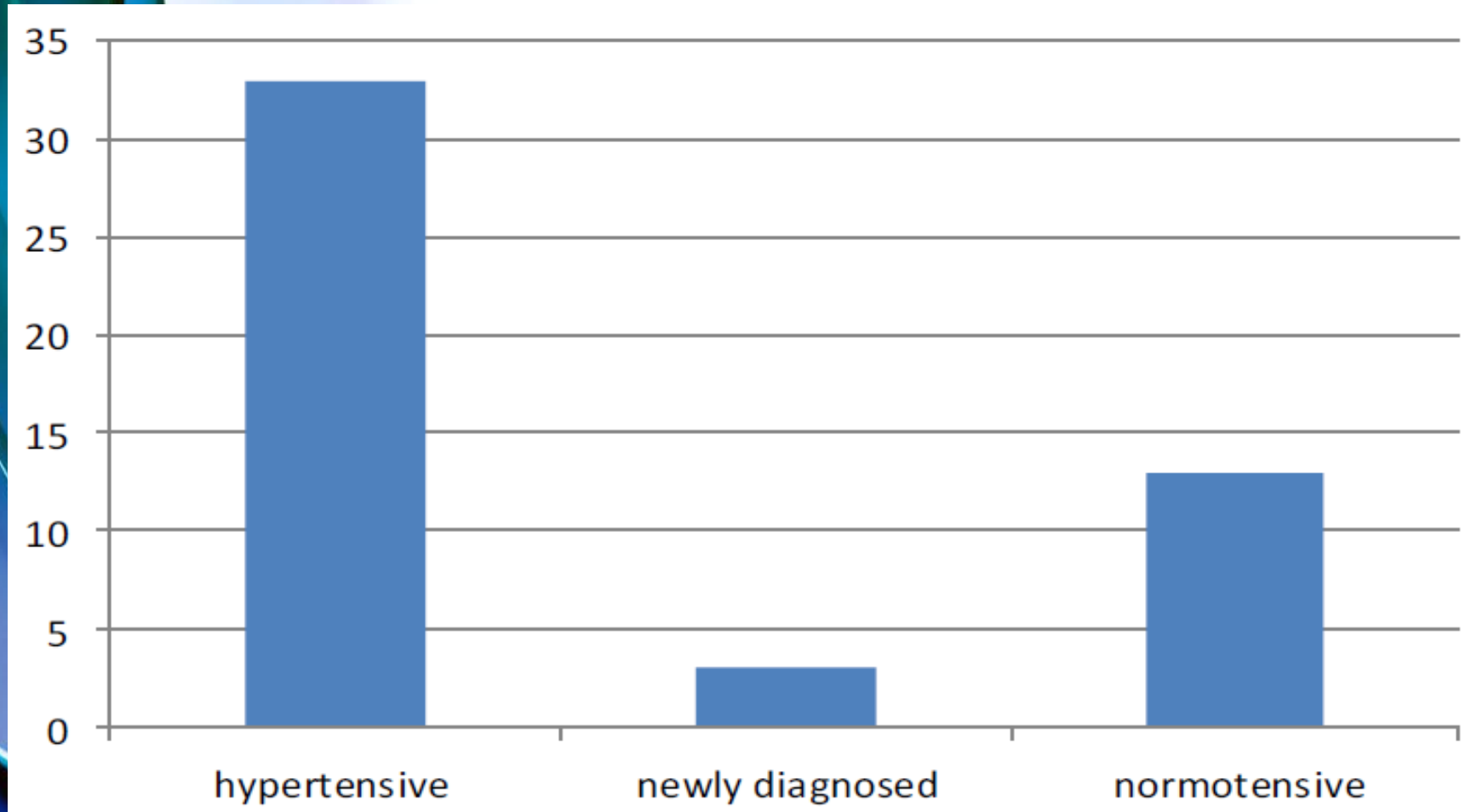
Pattern of Anemia in Patients

Sex	Combined deficiency anaemia	Microcytic Hypochromic anaemia	Normocytic normochromic anaemia	p-value
Male	5(15.2%)	5(15.2%)	23(69.7%)	0.006
Female	1(5.9%)	10(58.8%)	6(35.3%)	

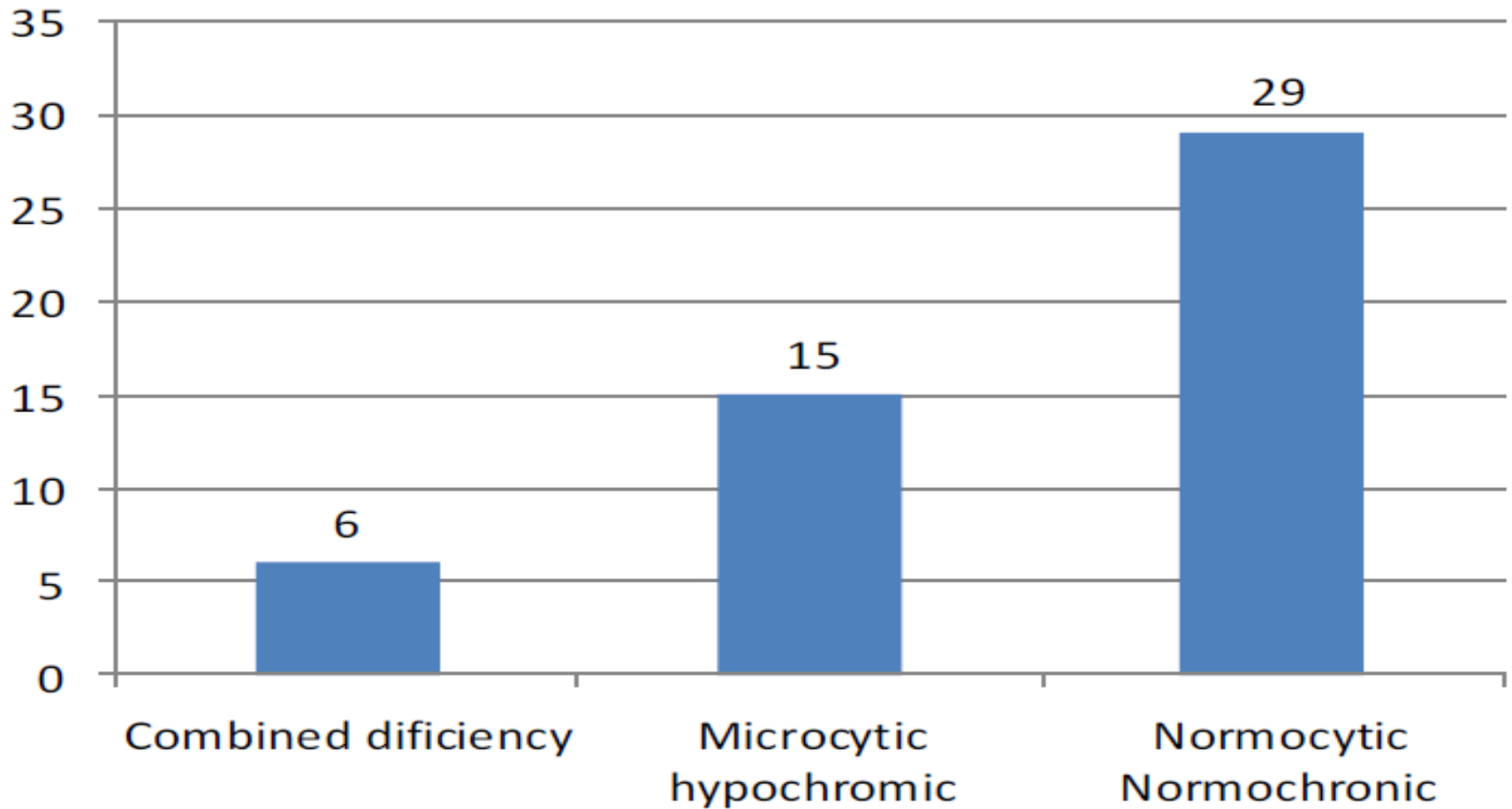
Age Distribution of Patients



Number of Hypertensive Patients



Pattern of Anemia in Patients



Patient Distribution: Red Cell Indices

No of patient	PBF finding	Mean MCV value	Reference value	Mean MCH value	Reference value	Mean MCHC value	Reference value
15(30%)	Microcytic hypochromic	65 fl	85±9 fl ¹⁸	18 pg/cell	29.5±2.5 ¹⁸ picogram(pg)/cell	23 gm/dl	33±2 ¹⁸ gm/dl
29 (58%)	Normocytic normochromic	85 fl		30 pg/cell		34 gm/dl	
6 (12%)	Combined deficiency	75 fl		22 pg/cell		30 gm/dl	

Iron Profile Status

Morphological pattern of Anaemia	Serum ferritin level Male-(18-270 ng/ml) Female 18-160 ng/ml)	Serum iron (60-170 mcg/dl)	TIBC (240-450 mcg/dl)
Microcytic Hypochromic 15 (30%)	15 ng/ml (male) 13 ng/ml(female)	50 mcg/dl	478 mcg/dl
Combined deficiency 6 (12%)	29ng/m 9male) 18 ng/ml(female)	55 mcg/dl	205 mcg/dl

Relation of Hypertension and Diabetes in CKD

Diabetes		Hypertension		
Diabetic	Non-Diabetic	Hyper-tensive	New Diagnosed	Normo-tensive
22	28	34	3	13



Conclusion and Recommendations

Limitations

- Conducted in only one hospital
- May not represent the whole country.
- May not represent epidemiological distribution
- Other confounding factors not completely adjusted



Discussion

Discussion

- A major health problem ²
- Anemia is common
- Anemia contributes: poor Quality of Life (QOL)
- Important cause of physical and mental impairments in CKD ³
- Improving anemia improves: many physical and mental impairments ³

² Gorddard J, Turner AN. Kidney and Urinary Tract Diseases. Davidsons Principles & Practice of Medicine, 21st edition, p.490

³ Levin et al: Canadian randomized trial of Hb maintenance to prevent or delay left ventricular mass growth in patients with CKD.

Am J Kidney Dis 2005; 46: 799- 81 1

Conclusions

On the basis of the results of the present study, **integrated with the understanding from the available literature:**

- Most patients suffered from **normocytic normochromic** anemia
- Female patients suffered from microcytic hypochromic anemia.

Recommendations

- One is a single center based
- **Cross sectional observational** study
- Study population is small
- Study period short
- **Further long term multi-center based prospective studies should be conducted**
- **Better steps in management of anemia in CKD**
- **Might help a beneficial health policy**



Thank You