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A Study to Determine the Prevalence of Different Types of Anemia and Assessing its Prescription Patterns in a Teritary Care Hospital

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Abstract:
• AIM AND OBJECTIVES:
This study aimed to determine
Prevalence Of Different Types of Anemia
Treatment Patterns
Sociodemographic factors and etiology of anemia
• METHODOLOGY:
We performed Retrospective observational study on 200 subjects of age group 18-70. We assessed prevalence rate of anemia and few parameters such as age, gender, types, symptoms, severity, comorbidities and prescription patterns. Data analyzed based on percentages depicted graphs.
• RESULTS:
Iron deficiency prevalence was 54.5%. Age group between18-35 found to be more anemic irrespective of gender. Half of the subjects were severe anemic.
• CONCLUSION:
The findings strongly suggest that focused education strategies to be improved on nutritional habits (vitamin and iron rich food). Awareness over immediate diagnosis which reduces further consequences of anemia.
• BACKGROIUNDINFORMATION:
Globally anemia is major health problem. Iron deficiency anemia is one of the most common types of nutritional anemia. Usually, deficiency of iron develops gradually and doesn't have clinically apparent symptoms until anemia becomes severe.
Keywords:- Anemia, Prevalence, symptoms, Sociodemographic factors, Prescription patterns.

I. INTRODUCTION

Anemia is an indicator of both poor nutrition and poor health. It is problematic on its own, but it can also impact other global nutritional concern. The prevalence of anemia remains high globally, particularly in low – income settings.

A. PREVALENCE OF ANEMIA IN WORLD:

Globally, anemia affects 1.62 billion people (95%CL: 1.50-1.74 billion), which corresponds to 24.8% of the population (95% CL: 22.9-26.7%). The highest prevalence is in preschool age children (47.4%, 95%CL: 45.7-49.1), and the lowest prevalence is in men (12.7%, 95%CL: 8.6-16.9%).[(1)]

B. PREVALENCE OF ANEMIA IN INDIA:

Anemia is widespread in India -58.6% of children, 53.2% of non-pregnant women and 50.4%of pregnant women were found to be anemic, as per the NFHS. India carries the highest burden of the disease despite having an anemia control programmed for 50 years.[(2)]

C. PREVALENCE OF ANEMIA IN TELANGANA:

Gradation of severe public health problem (SPHP).

Prevalence of anaemia (%)	Graded category of public health significance.
40.0-59.9	Grade 1 SPHP
60.0-79.9	Grade 2SPHP
>_80.0	Grade 3 SPHP

Children from 6 months to 59 months were having highest prevalence of both, anemia (68%) and severe anemia (10%). This was followed by pregnant women aged 15to 49 years and girl child 6 to 9 years. Four of the southern states of India including Andhra Pradesh, Telangana, Karnataka, Tamil Nādu fall in the grade2 SPHP (sever public health problem).[(3)]

D. DEFINITION:

Anemia is a condition in which the number of red blood cells or the hemoglobin concentration within them is lower than normal. Hemoglobin is needed to carry oxygen and if you have too few or abnormal red blood cells, or not enough hemoglobin, there will be a decreased capacity of the blood to carry oxygen to the body tissues. This results in symptoms such as fatigue, weakness, dizziness, and shortness of breath, among others. The optimal hemoglobin concentration needed to meet physiologic needs varies by age, sex, elevation of residence, smoking habits and pregnancy status.[(4)]

E. AIM

Our aim is to determine the prevalence of different types of anemia and assessing its prescription patterns.

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II. MATERIALS AND METHODS

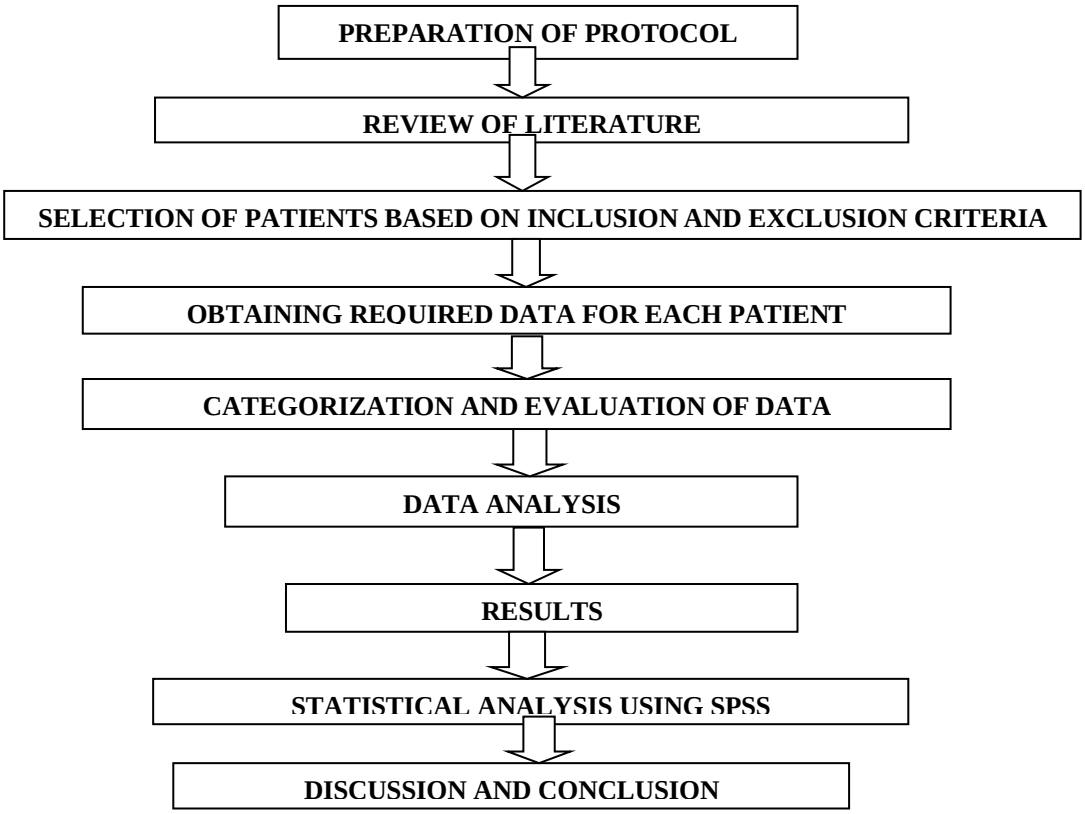
- MATERIALS:

The data was collected in specially designed pro-forma for collecting patient details along with relevant laboratory and other data. A well-designed case record form was used to collect the data of the recruited patients retrospectively and from laboratory reports and case file of the patient.

- STUDY INSTRUMENTS:

PATIENT PROFORMA FORM- [Data Entry Form]: The collected data was incorporated in Pre designed patient pro-forma and information regarding, social history, comorbidities, adverse effects and relevant data was collected.

- PLAN OF THE WORK:



- METHOD:
  - RESEARCH AREA: The study was conducted in Malla Reddy Hospital located in Suraram, Hyderabad.
  - RESEARCH DESIGN: Retrospective Observational study.
  - SAMPLE SIZE: 200 patients are considered, those who fulfil the exclusion and inclusion criteria selected for the study.
  - RESEARCH PERIOD: This study was carried out for a period of 6 months.
- STUDY CRITERIA
  - INCLUSION CRITERIA:
    Patients with either of gender.
    Patients with age 18 – 70
    Patients with anemia
    Anemia with other comorbities
- EXCLUSION CRITERIA:
  - Critically ill patients
  - Patients with age below 18 and above 70
- MATERIALS USED:
  - Patient data collection form.
- METHODS OF COLLECTION OF DATA:

the source data {Retrospective} was collected from MRD of MALLAREDDY HOSPITAL.

- STUDY PROCEDURE:
  - Based on the inclusion and exclusion criteria subjects are chosen.
  - Data was collected and analysed for demographics,
  - Then data is analysed.
- METHODOLOGY:
  - Subjects are selected based on the inclusion and exclusion criteria.
  - Study duration was for 6 months.
  - Participant's data, prescription and demographic details were recorded on case record form.
  - Data analysis and statistical calculations were done.
  - Final discussion and conclusion were made regarding different types of anemia and its prescription patterns
- DATA ANALYSIS:
  - The data was collected and then analyzed using MS-Excel.
  - The results are depicted in the form of percentages and graphs.

- PATIENT PROFILE FORM

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Department of pharmacy practice

➢ **PATIENT PROFILE FORM**

Patient name:	**IP No:**		**Date of admission:**
Age	**weight:**	**sex:**	**Date of discharge:**
Department:	**Consultant:**		
Provisional Diagnosis:			
COMPLAINTS ON ADMISSION:			
PAST MEDICAL HISTORY:			
PAST MEDICATION HISTORY:			
SOCIAL HISTORY: **Smoking :** **Alcohol :** **Chewing Tobacco :**	**ALLERGIES:** **1.FOOD :** **2.DRUG :** **3.OTHERS :**		
FAMILY HISTORY:	**SURGICAL HISTORY:**		
PHYSICAL EXAMINATION:			

DATE										
TEMPERATURE(°F);										
BLOOD PRESSURE (mm/Hg):										
PULSE RATE (bpm):										

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<table>
<tr><th>Complete Blood Picture</th><th>Liver function Test</th></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">Hb(g/dl) (M-11-16, F-11-14)
RBC (10^6 cells/cumm) (4-6.5):
WBC (cells/cumm) (4000-11000):
Differential leucocyte count:
Neutrophils (40-70%):
Lymphocytes (20-45%):
Eosinophils (01-06%):
Monocytes (02-10%):
Platelet count (1.5-4.5 lakhs/cumm)</td><td>Serum bilirubin total(0-1mg):
Direct :(up to 0.25mg/dl):
Indirect:
SGOT (Upto 65 IU/L):
SGPT (Upto37 IU/L):
ALP (15-116 IU/L):
Total proteins(6-8gm/dl):
Albumin (3.2-5.8gm/dl):
Globulin (2.2-4.8gm/dl)):</td></tr>
<tr><td>Lipid profile(mg/dl)</td></tr>
<tr><td>Peripheral smear:</td><td rowspan="4">Total cholesterol (140-250):
HDL cholesterol (30-65):
LDL cholesterol (80-180):
VLDL Cholesterol (5-45):
Triglycerides (25-160):
TC/HDL Ratio (upto 4.5):</td></tr>
<tr><td>RBCs:
WBCs:</td></tr>
<tr><td>ESR (M-0-10mm/hr; F-0-20):</td></tr>
<tr><td>Urine analysis:</td></tr>
<tr><td rowspan="3">Colour:
Appearance:
Pus cells:
Albumin:
Glucose:
RBCs:</td><td>Biochemical Investigation(mg/dl):</td></tr>
<tr><td>Serum creatinine (0.6-1.4):
Blood Urea (14-45):</td></tr>
<tr><td>Serum electrolytes(mmols/L)</td></tr>
<tr><td>Thyroid Function Test</td><td rowspan="2">Serum sodium (135-156):
Serum potassium (3.6-5.5):
Serum chlorides (98-108):
Serum phosphates (2.5-5):
Serum calcium (8-108):</td></tr>
<tr><td>T_3(60-181ng/dl):
T_4(7.3-15µg/dl):
TSH (0.55-4.78IU/L):</td></tr>
<tr><td>Other investigations:</td><td>Blood sugar(mg/dl)
Fasting blood sugar(70-110):
Post lunch blood sugar(70-150):
Random blood sugar(80-1120:</td></tr>
<tr><td colspan="2">Radiological Reports:</td></tr>
<tr><td colspan="2">Final diagnosis:</td></tr>
</table>

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DRUG TREATMENT CHART (Significant Drugs)												
Trade name	**Generic name**	**Route**	**Dose**	**Frequency**								

III. RESULTS

- RESULTS AND INFERENCES

A. DEMOGRAPHIC DETAILS OF PATIENTS

GENDER	NO. OF CASES	PECRENTAGE
Male	74	37%
Female	126	63%

Table 1: PREVALANCE OF ANEMIA BY GENDER

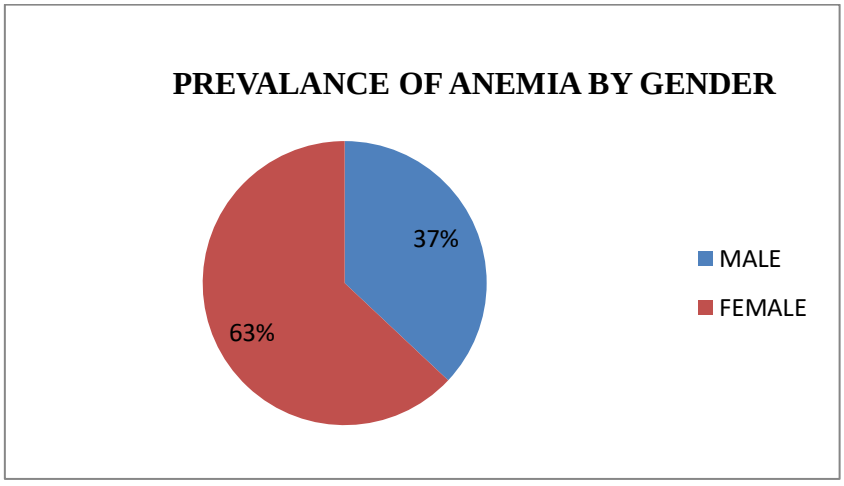

Fig. 1: PIE CART DEPICTING DISTRIBUTION BY GENDER

INFERENCE: A pie chart distribution shows that out of 200 ANEMIC patients. Majority of the patients were Female (63%) And least were Male (37%)

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B. PREVALENCE OF ANEMIA AMONG DIFFERENT AGE GROUPS

AGE	NO. OF CASES	PERCENTAGE
18-35	117	**58.5%**
36-50	50	25%
51-70	33	16.5%

Table 2: AGE WISE DISTRIBUTION OF CASES

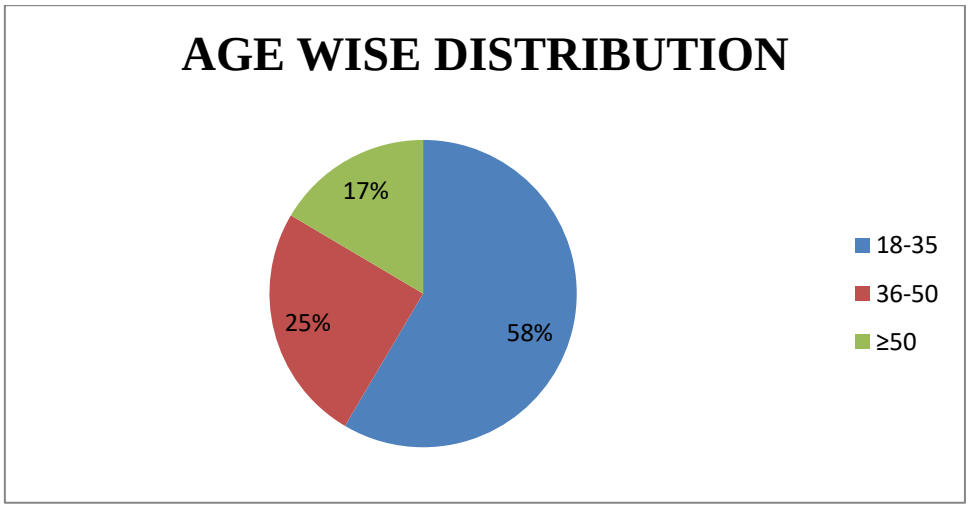

Fig. 2: PIE CHART DEPICTING DISTRIBUTIONS BY AGE

INFERENCE: A pie chart showing distribution of patients according to age. Most of the patients are found at age 18-35 followed by 36-50 and least no. of patients found at age above 50-70

C. ASSOCIATION BETWEEN AGE AND GENDER IN STUDY GROUP

AGE	TOTAL	MALE	FEMALE
18-35	59.50%	20%	39.50%
36-50	23.50%	8%	15.5%
>50	17%	7%	10%

Table 3: ASSOCIATIONS BETWEEN AGE AND GENDER IN STUDY GROUP

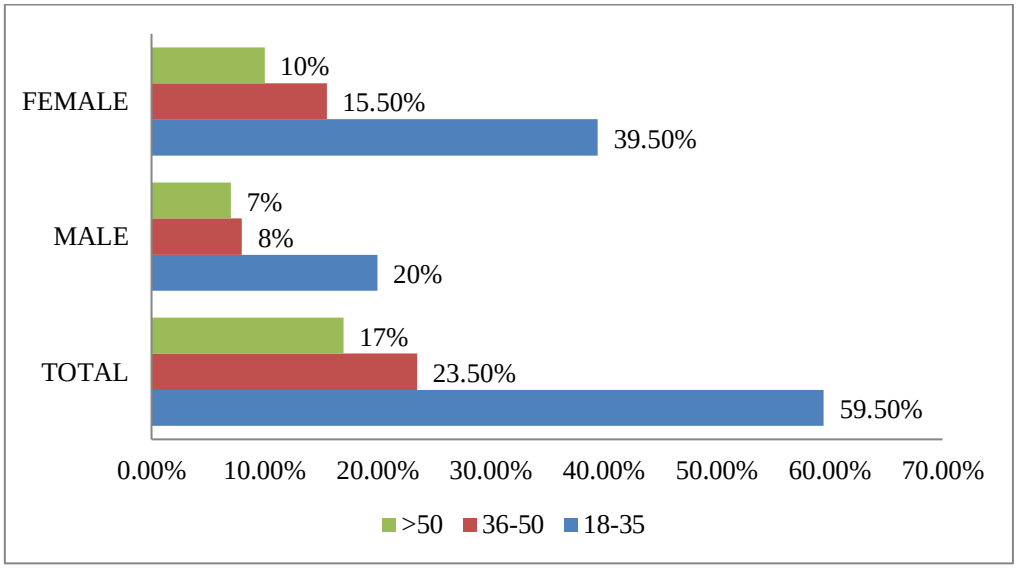

Fig. 3: Column Diagram Depicting Distribution of study group according to age and gender

INFERENCE: The distribution of population as per their age and gender depicted graphically. Most of the patients both male and female found at age 18-35 followed by 36-50 and least noted at age above 50

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a) CLINICAL CHARECTERISTICS OF STUDY GROUP

SYMPTOMS	NO. OF CASES	PERCENTAGE
1. Fatigue	60	30%
2. Generalized weakness	77	**38.5%**
3. Shortness of breath	65	32.5%
4. Fever	55	27.5%
5. Pallor	41	20.5%
6. Malena	10	5%
7. Headache	15	7.5%
8. Loss of appetite	36	18%
9. Palpitations	7	3.5%
10. Giddiness	30	15%
11. Bleeding	16	8%
12. Cough	16	8%
13. Miscellaneous	60	30%

Table 4: DISTRIBUTIONS OF CASES ACCORDING TO SYMPTOMS

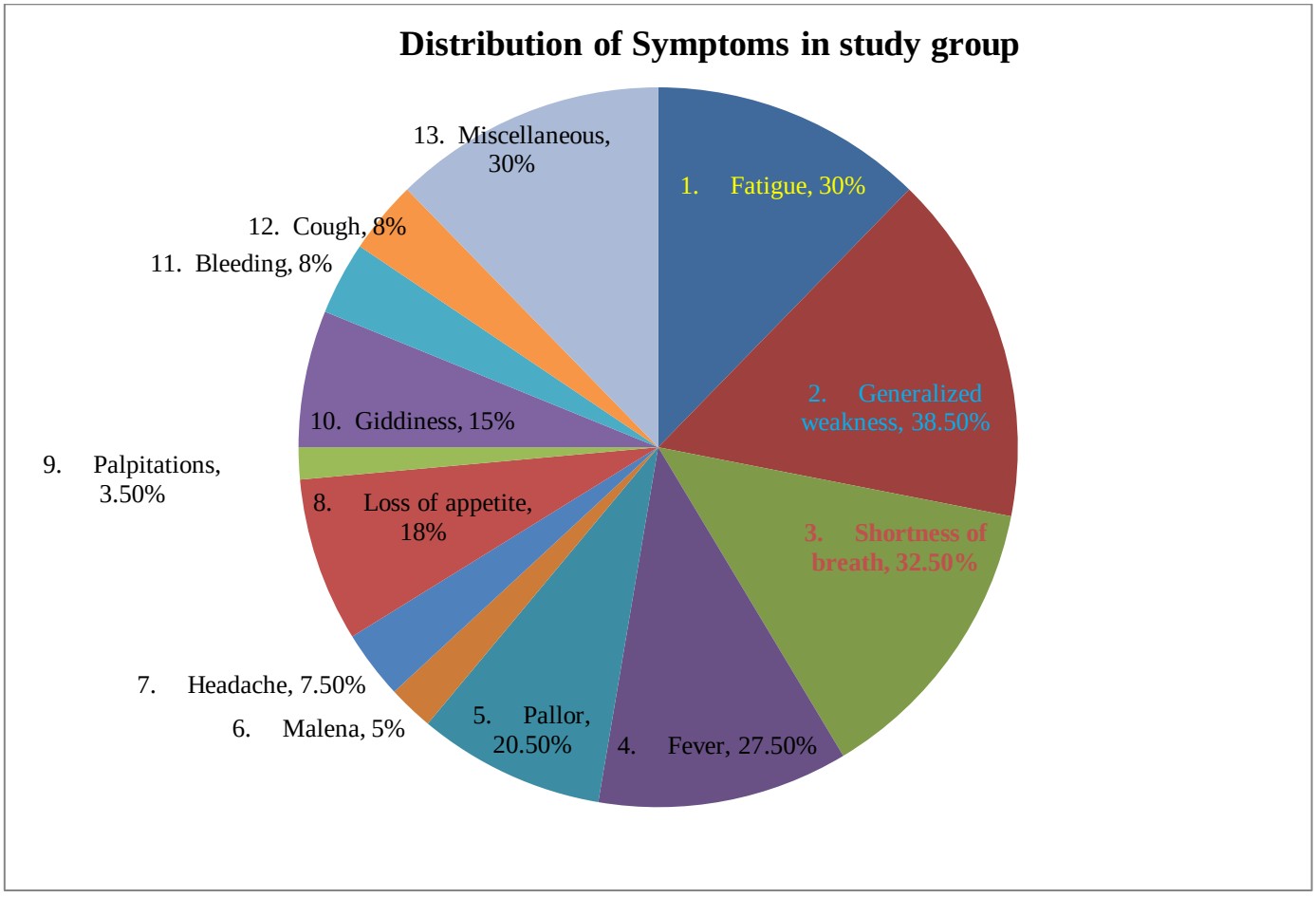

Fig. 4: PIE CHART DEPICTING DISTRIBUTION OF SYMPTOMS IN STUDY GROUP

INFERENCE: A Pie chart is showing the distribution of symptoms over the patients. Most of them found to have **Generalized Weakness (38.5%)** followed by shortness of breath (32.5%), miscellaneous (30%), fatigue (30%), fever (27.5%), pallor (20.5%) loss of appetite (18%), giddiness (15%), bleeding (8%), cough (8%), headache (7.5%), malena (5%) palpitations (3.50%)

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b) DISTRIBUTION ON TYPE OF ANEMIA IN STUDY GROUP

TYPE OF ANEMIA	NO. OF CASES	PERCENTAGE
1. Iron deficiency	**109**	**54.5%**
2. Megaloblastic	37	18.5%
3. Hemolyticanemia	11	5.5%
4. Hemorrhagicanemia	11	5.5%
5. Pancytopenia	9	4.5%
6. Thrombocytopenia	24	12%

Table 5: REPRESENTATING THE TYPE OF ANEMIA IN ANEMIC PATIENT

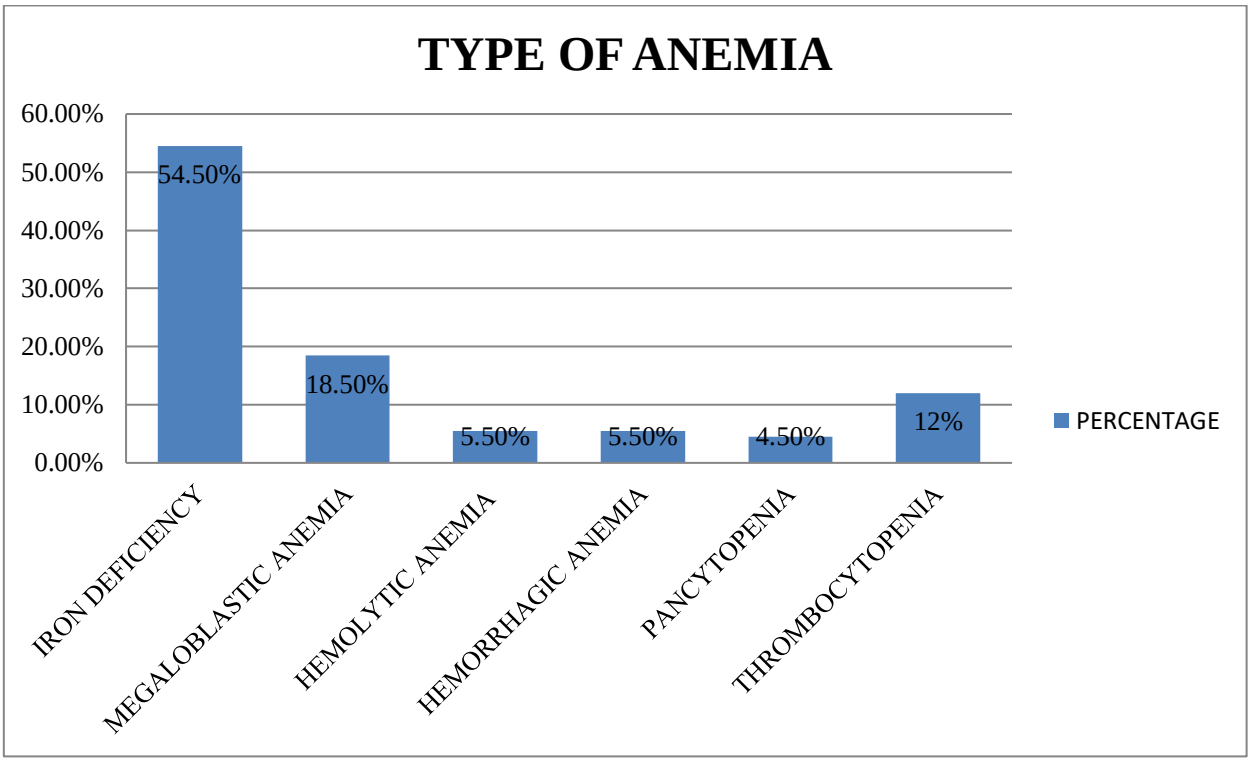

Fig. 5: DISTRIBUTIONS ON TYPE OF ANEMIA IN STUDY GROUP

INFERENCE: A pie chart shows most of the patients found to have **Iron Deficiency (54.5%)** followed by megaloblastic anemia (18.5%) least people were observed in Pancytopenia.

c) DISTRIBUTION OF PATIENTS BASED ON SEVERITY OF ANEMIA

SEVERITY	NO. OF CASES	PERCENTAGE
Mild	52	26%
Moderate	48	24%
Severe	100	50%

Table 6: PREVALNCE ON SEVERITY OF ANEMIA

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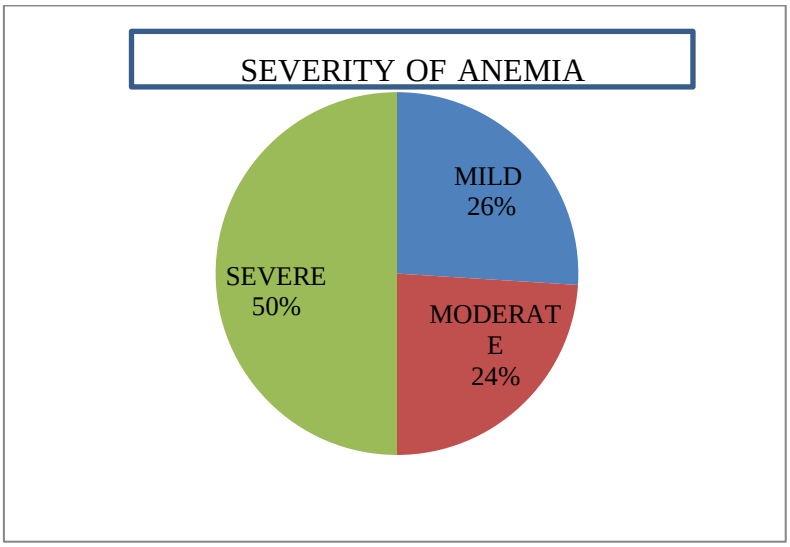

Fig. 6: DISTRIBUTIONS OF PATIENTS BASED ON SEVERITY

INFERENCE: A pie chart shows that half of the people had severe anemia (50%) followed by mild (26%) least patients had moderate anemia (24%)

a. PREVALENCE OF ANEMIA CORRELATE TO COMORBIDITIES

COMORBITY	NO. OF CASES	PERCENTAGE
Comorbid	54	27%
Non-Comorbid	146	73%

Table 7: DISTRIBUTION OF COMORBITY AND NON – COMORBID PATIENTS

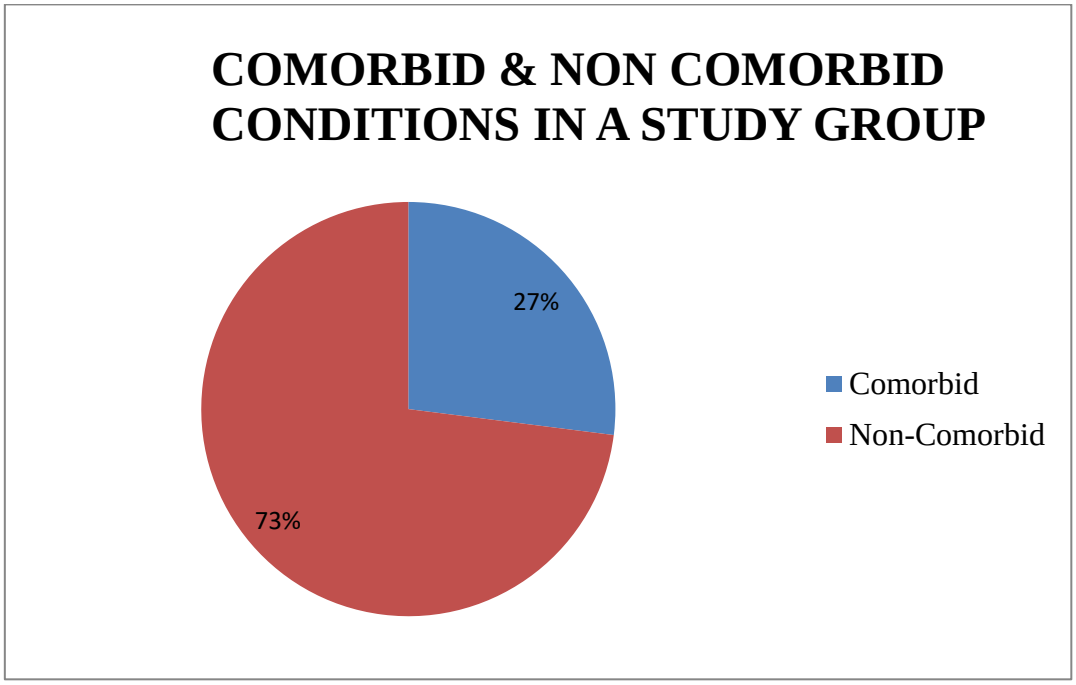

Fig. 7: distributions of patients based on comorbidity

INFERENCE: A pie chart explains that most of the patients belong to non- commodity (73%) least patients had comorbities (23%)

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b. PREVALENCE OF ANEMIA IN PREGNANT AND NON-PREGNANT WOMEN

PREGNANCY CASES	NO. OF CASES	PERCENTAGE
Pregnant	12	9.5%
Non- pregnant	114	90.5%

Table 8: Prevalence of Anemia in Pregnant and Non-Pregnant Women

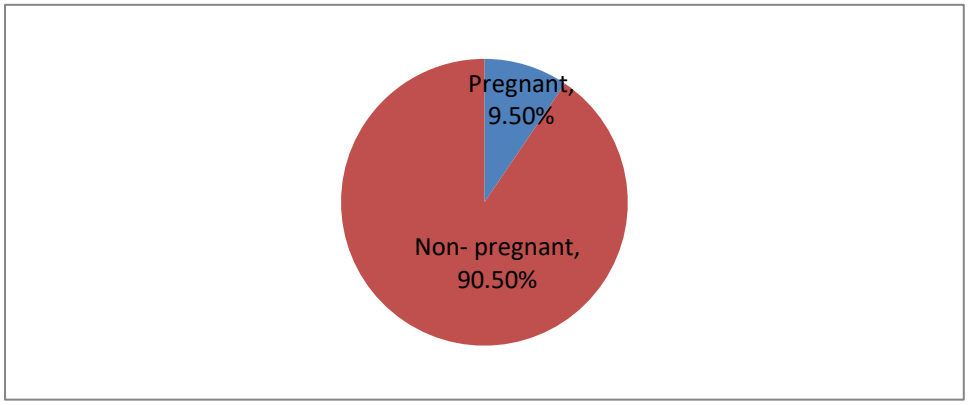

Fig. 8: DISTRIBUTION OF ANEMIA IN PREGANANT AND NON-PREGNANT WOMEN

INFERENCE: Out of 126 Women Most of the Women were non-Pregnant (90.5%) and least of them were Pregnant (9.5%)

d) PRESCRIPTION PATTERNS OF STUDY GROUP

ORAL MEDIACTION	NO. OF CASES	PERCENTAGE
1. Orofer-XT	84	**42%**
2. Tavofer	27	13.5%
3. Limcee	52	26%
4. Homodip	7	3.5%
5. Neurobion forte	30	15%
6. Neurokind plus	4	2%
7. Tranexa	8	4%
8. Supradyn	32	16%
9. B.complex	6	3%
10. Flovit	21	10.5%
11. Zincovit	12	6%
12. Riboflavin	3	1.5%
13. Eido-FE forte	2	1%
14. Shelcal sachets	4	2%
15. Evion	4	2%
16. Fesovit	7	3.5%
17. Dexorange	2	1%
18. Calcet D3	10	5%
19. Reifer XT	1	0.5%
20. Trendyfer XT	2	1%
21. Tavit	4	2%
22. Polybion	1	0.5%
23. Methocobalamin	2	1%
24. Livozen	2	1%

Table 9: DISTRIBUTION OF ORAL MEDICATION IN STUDY GROUP

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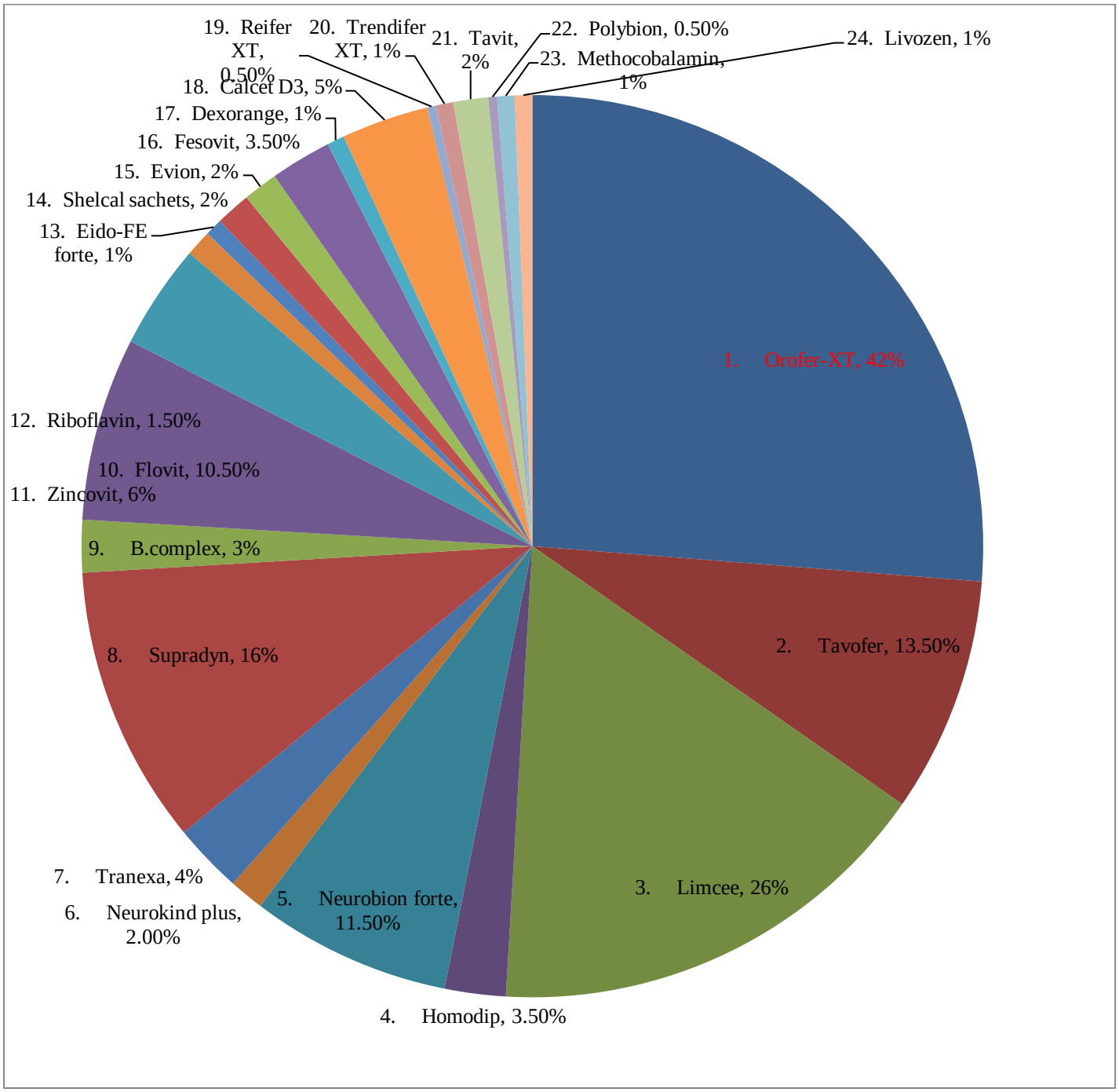

Fig. 9: PIE CHART DEPICTS ORAL MEDICATION AMONG ANEMIC PATIENTS

INFERENCE: pie chart shows that most of the patients were prescribed with Orofer XT (42%) followed by Limcee (26 %) Supradyn (16%) and least patients had received Polybion (0.5%)

e) DISTRIBUTION OF ORAL SUPPLEMENTS IN A STUDY GROUP

SUPLEMENTS	NO. OF CASES	PERCENTAGE
Elemental Iron Folic acid	96	48%
Vitamin B	73	36.5%
Vitamin C	52	26%
Vitamin D	14	7%
Vitamin E	4	2%
Multivitamin	80	40%

Table 10: DISTRIBUTIONS of ORAL SUPPLEMENTS IN A STUDY GROUP

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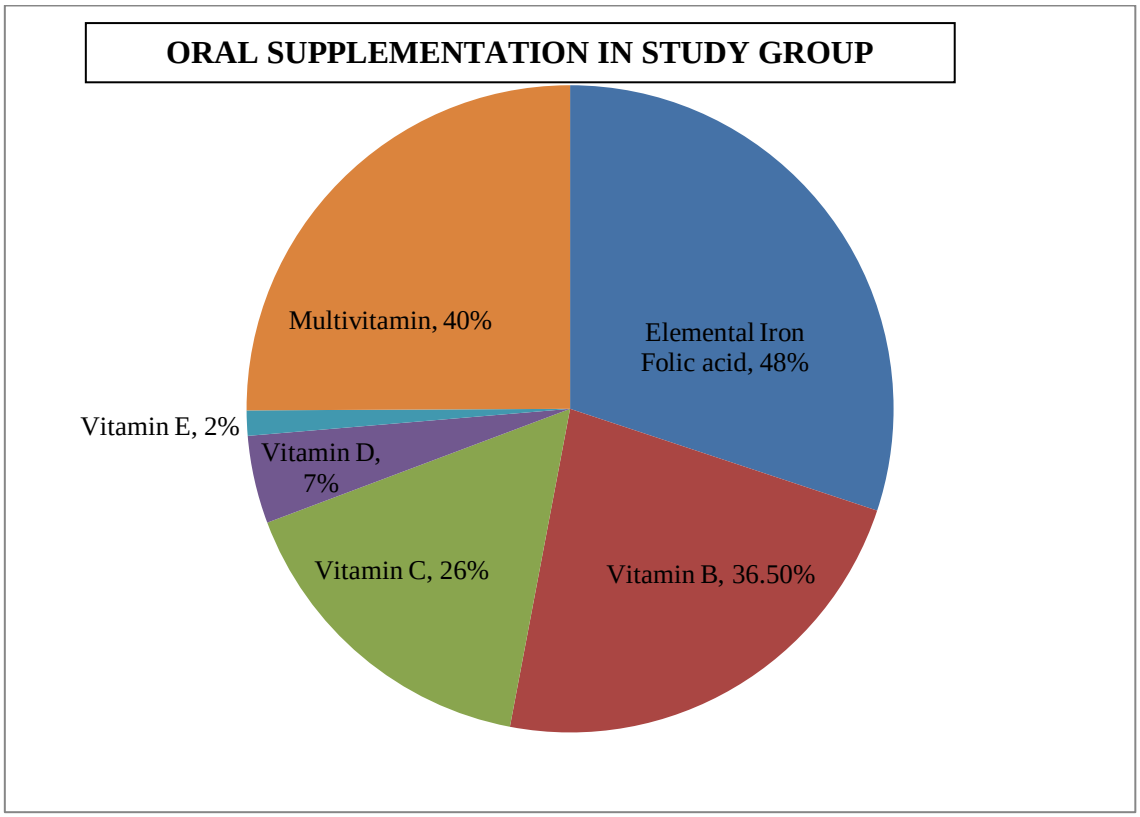

Fig. 10: PIE CHART DEPICTS ORAL SUPPLEMENTATION IN STUDY GROUP

INFERENCE: Greater number of people were prescribed with vitamin B supplements followed by iron supplements and least were prescribed with vitamin D supplement

f) DISTRIBUTION OF INTRAVENOUS MEDICATION IN STUDY GROUP

INTRAVENOUS	NO.OF CASES	PERCENTAGE
1. Orofer	18	16.5%
2. Optineuron	66	60.5%
3. MVI	8	7.3%
4. Thiamine	7	6.4%
5. Vit B12	3	2.7%
6. Neurorex	4	3.6%
7. Meganeuron Forte	8	7.3%
8. Vitcofol	1	0.9%
9. Cal.Glucoante	2	1.82%
10. Tranexa	5	4.5%
11. Ethamsylate	2	1.82%

Table 11: DISTRIBUTION OF INTRAVENOUS MEDICATION

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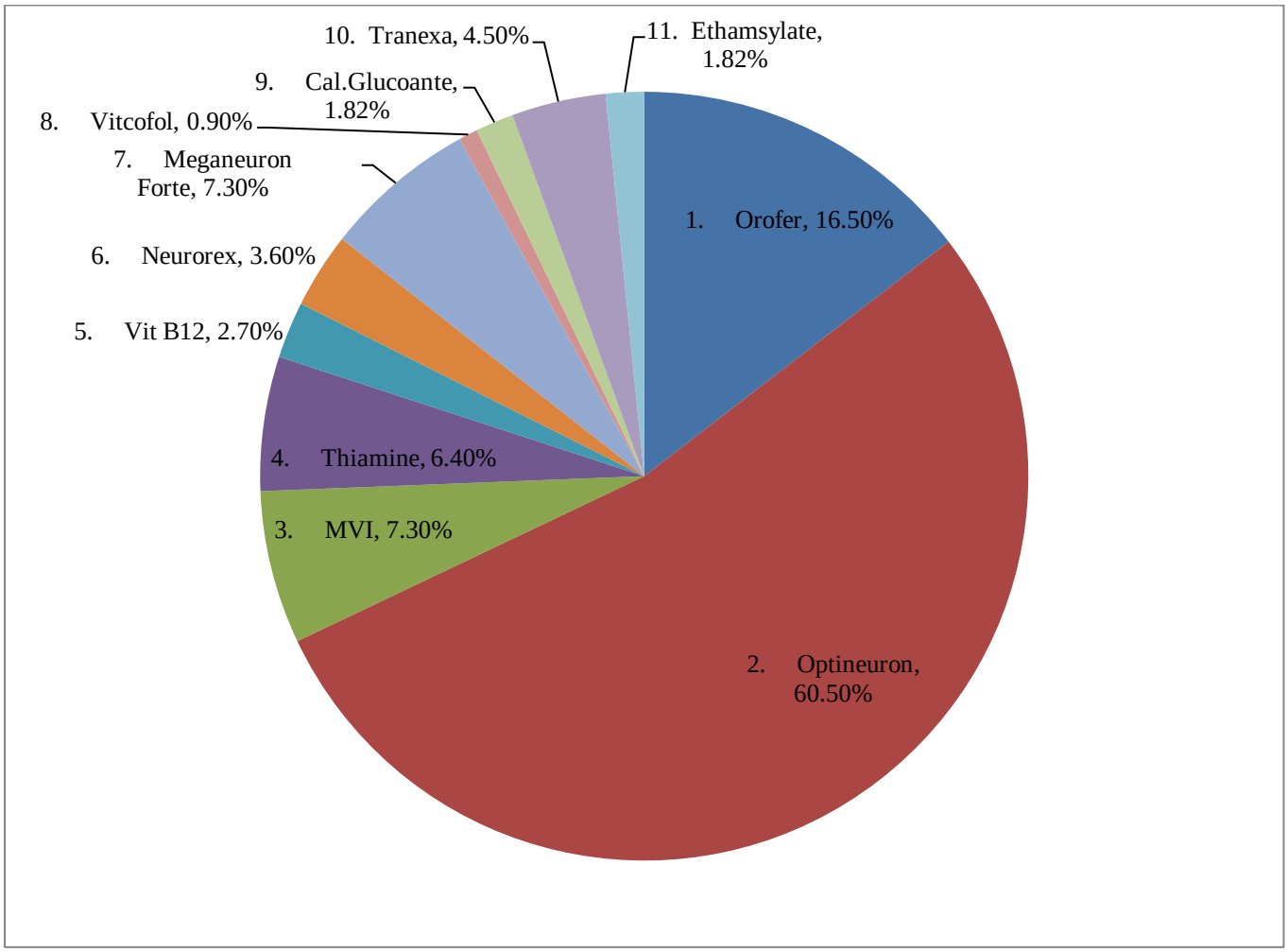

Fig. 11: PIE CHART DEPICTING DISTRIBUTION OF INTRAVENOUS MEDICATION IN STUDY GROUP

INEFERENCE: Greater numbers of people were prescribed with **OPTINEURON INJECTION** followed by Orofer and multivitamin and least were prescribed with Vitcofol

g) DISTRIBUTION OF PARENTERAL SUPPLEMENTATION IN A STUDY GROUP

SUPPLEMENT	NO. OF CASES	PERCENTAGE
ELEMENTAL IRON WITH FOLIC ACID	18	9%
VITAMIN B	89	44.5%
VITAMIN D	2	1%
MULTIVITAMIN	8	4%

Table 12: DISTRIBUTION OF PARENTERAL SUPPLEMENTATION IN A STUDY GROUP

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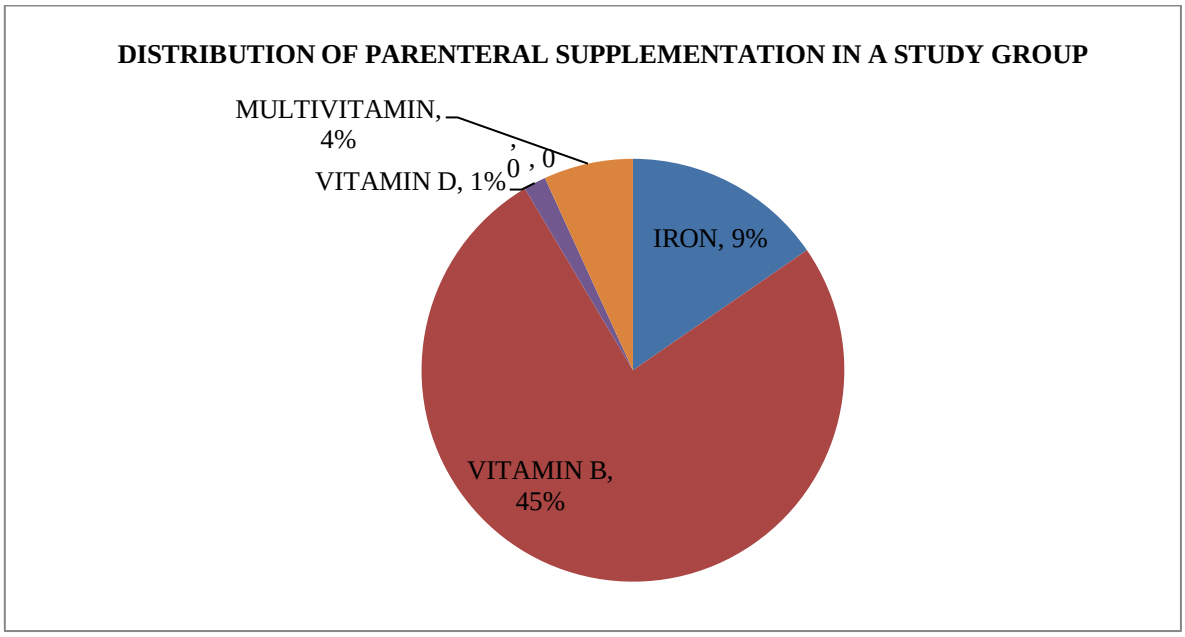

Fig. 12: PIE CHART DEPICTING PARENTERAL SUPPLEMENTATION IN STUDY GROUP

INFERENCE: Most of the patients given with vitamin B supplement followed by iron supplements least patients prescribed with vitamin D

h) COMPARISION OF ORAL AND I\V THERAPY

TYPE OF THERAPY	NO. OF CASES	PERCENTAGE
ORAL	200	100%
ORAL+PARENTERAL	109	54.5%

Table 13: COMPARISION OF ORAL AND PARENTERAL THERAPY

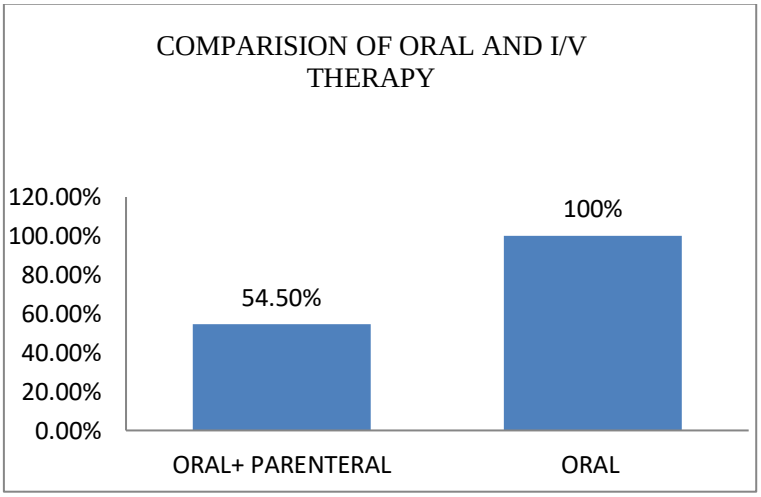

Fig. 13: GRAPH DEPICTS COMPARISION OF ORAL AND I\V THERAPY

INFERENCE: out of 200 people, 200 people underwent oral therapy, among them 109 people underwent oral and parenteral therapy

i) DISTRIBUTION OF BLOOD TRANSFUSION IN A STUDY GROUP

TRANSFUSION	NO. OF CASES	PERCENTAGE
Blood transfusion	61	30.5%
No transfusion	139	69.5%

Table 14: DISTRIBUTION OF BLOOD TRANSFUSION IN A STUDY GROUP

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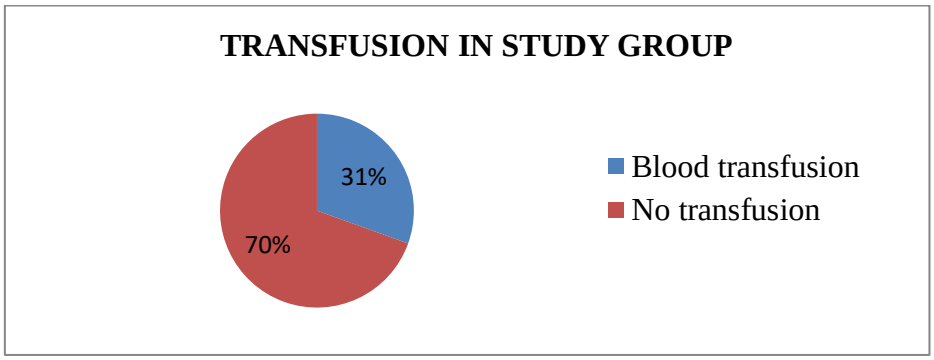

Fig. 14: DISTRIBUTION OF BLOOD TRANSFUSION IN A STUDY GROUP

INFERENCE: Among 200 people, 61 people (31%) underwent blood transfusion

IV. DISCUSSION

Our randomized Retrospective study reveals high proportions of iron deficiency anemia cases were female. It indicates iron deficiency is main cause of anemia. India is facing a public health problem with prevalence of anemia. This study illuminates on prevention of anemia by studying on sociodemographic factors, risk factors, clinical manifestations, prescription patterns of anemia. It is inferred that sociodemographic factors like age, gender was associated with anemia. In our study we found female people are more anemic Most of the studies on anemia focused on female population but our study states men with anemia are also important public health problem may be male percentage is less compared to female but male also considered. Vittal K Gupta et al study found high prevalence rate of anemia in both irrespective of gender.

Prevalence of anemia is seen in people with age 18-35 followed by age 36-50. It is clear that not only geriatrics prone to anemia young adults has to take preventive measures of anemia. Growing children has more chances of being anemic due to metabolic changes. Hence it is important to educate young adults on prevalence of anemia irrespective of gender.

Most of the studies like Krishnavenikandaswamy et al and Vittul k gupta et al found prevalence of anemia is seen in mild anemia followed by moderate and severe anemia but in our study severe anemic patient cases found more followed by moderate and mild. Reason we believe is most of the studies are community-based studies so mild anemic cases will be more because most of the people neglect symptoms and don't go to hospital until condition gets worsen and this is reason, we see newly diagnosed patients were more in community-based studies. In our retrospective study people reported to hospital when their condition is worsened so we found high proportion of severe anemic patients.

Hence, it's an urgent need to develop productive strategies to educate on awareness of clinical manifestations of anemia. In our study majorly reported symptoms were Generalized weakness followed by shortness of breath, fatigue, fever, and pallor. Most of the people do not take these symptoms as serious. Education and awareness over anemia symptoms are needed. In our study 27% of people reported comorbidities, like diabetes mellitus, heart disease, thyroid, heart diseases and renal insufficiency. Joya Ghoshal et al Samuel antwi-bafour et al Shannon M. Dunlay et al Krisnaveni kandaswamy stated that anemia is prevalent in comorbid condition and is associated with increase in mortality rate. People with comorbidities are closely monitored to decline consequences by Anemia.

9.5% of women reported pregnancy with anemia. pregnancy is considered as one of the determinants of anemia. Keyfyalew Addis et al stated more than half of pregnant women were anemic. Hence, Iron supplemtation and special attention during pregnancy is recommended to reduce anemia.

Prescription patterns of study group proclaimed that most of the people were prescribed with Orofer XT (Elemental iron and folic acid) followed by Limcee, Supradyn, Neurobion forte, Tavofer, in oral medication. To make it simplified in oral supplementation form most of the people were prescribed with elemental iron and folic acid supplementation followed by multivitamin, vitamin B, C, D and E.

In parenteral medication, most of the people were treated with Optineuron followed by Orofer injection. To define parenteral medication in I\V supplementation most of the people were prescribed with parenteral Elemental iron and folic acid supplementation followed by vitamin B, D and multivitamin supplements. Mohammed Sarfaraz et al states most commonly prescribed drug was OROFER XT for anemic patients.

Prescribing patterns of drugs in anemic patients need to be continually monitored and patient's awareness should be enhanced.

- **Limitations:**

The study population was derived from small region of single hospital with small sample size so, findings may not be pertinent to other geographic regions and this study results cannot be generalized.

Anemia was associated with many factors like nutritional status, diet, literacy, open defecation, social habits, marital status, body mass index, and age less than 18 and greater than 60 were not included in the study.

V. CONCLUSION

Iron deficiency anemia is more perturbing in INDIA. Prevalence of anemia is seen iron deficiency anemia of age 18-35. Every parameter of our study reflects prevalence of anemia is concerned in India. Exact results for the prevalence of anemia are different from study to study but anemia is extremely serious public health problem not only in India also in the world.

Based on our study we conclude that iron deficiency anemia is more preventable. Preventive measures are providing proper education and understanding on anemia its causes and symptoms and improved life style and healthy diet by students .

This study highlights the importance of immediate diagnosis which would decline severity of anemia. Everyone should be aware of clinical manifestations of anemia. Pregnant women and people with comorbities have to be monitored regularly because mortality rate increases if the consequences get worsened.

Local health centers must be aware of prevention of anemia in their respective areas. WHO suggest daily dose of 30-60gm of iron and 0.4gm of folic acid supplement is must for all.

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