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MANUSCRIPT FULL TITLE:

A PROSPECTIVE STUDY OF HEMOGLOBINOPATIES IN PREGNANCY IN A TERTIARY CARE HOSPITAL

SHORT TITLE:

HEMOGLOBINOPATIES IN PREGNANCY

AUTHOUR DETAILS

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MATERIALS:

A Prospective observational study in Andhra medical college, kgh vishakapatnam. Pregnant mothers with hemoglobinopathy visiting department of obstetrics and gynecology . Sample size is 60.

METHODOLOGY:

Pregnant women who attended OPD or patients admitted in labor room; KGH, Vizag are opted for the study. Antenatal women with anemia are identified and subjected to blood tests like hemogram with peripheral smear, Sickling test and Hb electrophoresis and diagnosed cases of hemoglobinopathy are included in the study.

RESULTS

Most of the patients are in young age group between 20 to 30yrs of age. Majority of the cases are booked patients who are diagnosed, followed up and managed in our hospital throughout their pregnancy. 78.33% of the patients are from tribal populations of Visakhapatnam. Most of the patients are primigravida constituting about 48.33% .Sickle cell trait is the common hemoglobinopathy observed in our study population. Common obstetrical complications seen are preeclampsia and oligohydramnios. 11.6% had preterm labor and 15% had IUGR. Anemia was observed in 81.67% and blood transfusions are more common in sickle cell disease. LSCS was the common mode of delivery and obstetrical causes are the common indications. Most of the patients carried till term and majority of patients had live births. Most common neonatal complication was LBW. Maternal mortality was 3.33%. Patients were known cases of sickle cell disease who succumbed to acute chest syndrome with ARDS and sepsis with AKI. Neonatal mortality was observed to be in 3.7%. There were 54 live births. Though incidence of the thalassemia minor is low in our study, the outcome of pregnancy in these variants is not a major obstetrical concern. Pregnancy in sickle cell disease has various maternal, obstetrical and

medical complications. So a multidisciplinary approach is essential to manage a pregnancy with sickle cell anemia.

DISCUSSION

Pregnancy with a hemoglobinopathy is a high risk condition which needs a specialist care and a multidisciplinary approach for its management. Proper preconception counselling, awareness of the condition, prenatal diagnosis, prompt evaluation and management of the complications is needed to reduce maternal and neonatal morbidity. Active screening programmes of population with high risk need to be implemented in health care to identify, counsel, and manage the condition.

Hemoglobinopathies are an area of future research in India and various genomic technologies play a role in the prenatal diagnosis to reduce the burden on health care and improve maternal and neonatal health status.

LIMITATION:

Limitation of the study is less sample size as the study is done in COVID Pandemic

ABSTRACT

1. To identify the pregnant women with anemia due to hemoglobinopathy.
2. To identify the various complications which occur in the mother and fetus throughout the course of the pregnancy.
3. To study the various interventions done to manage the complications.
4. To study the pregnancy outcome

Most common type of hemoglobinopathy is Sickle cell trait which constitutes about 56.66% Most patients had moderate anemia, about 60%. 11.67% had mild anemia.13 patients had severe anemia. 56.66% of patients had Sickle cell trait , followed by sickle cell disease which constitutes 25%. Sickle □ thalassemia constitutes about 8.33%. 6 patients had thalassemia minor.

Most common obstetrical complication was preeclampsia and oligoamnios. About 7 patients had preterm labor. 15% of the pregnancies had IUGR.

Most common medical complication observed was anemia; about 81.67 % .Bone crises developed in 10 patients constituting about 17.54 % . UTI was seen in 5 patients who had SCT.

In our study most common hemoglobinopathy observed is Sickle cell trait ; constitutes about 56.66% .In other Indian studies who studied Sickle cell disease in their regions reported sickle cell trait to be most common hemoglobinopathy observed . SCT constitutes about 44.44% Smita D 'Couth, 77.78% in Ashwini et al and 85.96 % in Varsha kose et al study. Severe anemia Hb <

7gm% is about 21.67%. I.e about 13 patients presented with severe anemia. In Daigavane et al study the percentage of severe anemia is 23.30% In Desai et al study in SCD population severe anemia accounts to 22.10% which is similar to our study.

INTRODUCTION:

A Prospective observational study.

Andhra Medical College, King George Hospital,

Visakhapatnam.

Pregnant mothers with hemoglobinopathy visiting the Department of Obstetrics and Gynecology of King George Hospital.

January 2020 to December 2021 in department of Obstetrics Gynecology, Andhra Medical college

Pregnant women with a hemoglobinopathy who have given consent to participate in the study.

EXCLUSION CRITERIA:

1. Antenatal with anemia due to iron and folic acid deficiency

2. Antenatal women with anemia due to acute blood loss.

3. Antenatal women with anemia of chronic diseases.

SAMPLE SIZE : 60

MATERIALS AND METHODS:

1. Pregnant women who attended OPD or patients admitted in labor room; KGH, Vizag are opted for the study.

2. Antenatal women with anemia are identified and subjected to blood tests like hemogram with peripheral smear, Sickling test and Hb electrophoresis and diagnosed cases of hemoglobinopathy are included in the study.

3. All Pregnant women previously diagnosed with hemoglobinopathy are also included in the study.

4. Diagnosed pregnant women are observed throughout their pregnancy course and various complications which occurred and interventions done and outcome of the pregnancy is studied.

STATISTICAL ANALYSIS:

All the relevant data collected is entered in the Microsoft excel spread sheet and analysed using statistical measures like percentage.

■Diagramatic representation of the data was presented in bar charts.

ETHICAL CONSIDERATIONS:

Prior permission is taken from institutional Ethics Committee, Andhra Medical College, Visakhapatnam.

A Written informed consent is taken from each individual of the study**.**

RESULTS

A total of 60 patients with hemoglobinopathies are observed in my study period at KGH, VISAKHAPATNAM.

A Total of 12,393 deliveries happened in my study period. According to this study the incidence of hemoglobinopathies is 0.48% . Majority of patients fall in age group of 20 to 30yrs of age; more in between 25 to 30 yrs. Out of 60 patients; most of the patients are primigravida who constitutes about

48.33% ,followed by second gravida who are about 38.33%

DISTRIBUTION ACCORDING TO TYPE OF HEMOGLOBINOPATHY

DISORDER	FREQUENCY (n)	PERCENTAGE %
SCT	34	56.66
SCD	15	25

β THALASSEMIA	6	10
SICKLE β THALASSEMIA	5	8.33

Most common type of hemoglobinopathy is Sickle cell trait which constitutes about 56.66%

DISTRIBUTION ACCORDING TO DEGREE OF ANEMIA

DEGREE OF ANEMIA	FREQUENCY (n)	PERCENTAGE %
MILD(10 to 10.9gm)	7	11.67
MODERATE (7 to 10gm)	36	60
SEVERE(<7gm)	13	21.67

Most patients had moderate anemia, about 60%. 11.67% had mild anemia.13 patients had severe anemia.

ACCORDING TO HEMOGRAM REPORT

HEMOGRAM REPORT	FREQUENCY (n)	PERCENTAGE %
MICROCYTIC HYPOCHROMIC ANEMIA [MCHC]	10	16.67%

NORMOCHROMIC NORMOCYTIC ANEMIA [NCNC]	50	83.33%

Majority of the hemogram reports revealed normocytic normochromic anemia.

HB ELECTROPHORESIS REPORT

TYPE	FREQUENCY	PERCENTAGE
HB AS	34	56.66
HB SS	15	25
HB A2	6	10
HBS +HB A2	5	8.33

56.66% of patients had Sickle cell trait , followed by sickle cell disease which constitutes 25%.

Sickle □ thalassemia constitutes about 8.33%. 6 patients had thalassemia minor.

OBSTETRICAL COMPLICATIONS

COMPLICATIONS	FREQUENCY (n)	PERCENTAGE %
ABORTIONS	2	3.33
PREECLAMPSIA	11	18.33
GHTN	5	8.33

IUGR	9	15
GDM	4	6.66
OLIGOAMNIOS	12	20
DOPPLER ABNORMALITY	7	11.66
PRETERM LABOR	7	11.66
ECLAMPSIA	2	3.33

Most common obstetrical complication was preeclampsia and oligoamnios. About 7 patients had preterm labor. 15% of the pregnancies had IUGR.

DISTRIBUTION ACCORDING TO MODE OF DELIVERY

NVD	22	38.59
LSCS	35	61.40

Most of the patients are delivered by LSCS, which constitutes about 61.40% .Most common indication of LSCS are obstetrical causes.

GESTATIONAL AGE AT BIRTH

GESTATIONAL AGE	FREQUENCY	PERCENTAGE
PRETERM <37WKS	18	31.04
TERM 37 to 40WKS	40	68.96

Most the babies are delivered at 37 to 39wks.

Preterm deliveries constitute about 31.04%

1. Hemoglobinopathies are inherited disorders of hemoglobin production. The WHO reports that approximately 5% of the world population is a carrier of abnormal hemoglobin disorders.
2. Incidence of hemoglobinopathies is about 0.48%. This low incidence is probably because of a wide group of patients referred to our hospital as this is a tertiary care center.
3. Most of the patients are in young age group between 20 to 30yrs of age.
4. Majority of the cases are booked patients who are diagnosed, followed up and managed in our hospital throughout their pregnancy.
5. 78.33% of the patients are from tribal populations of Visakhapatnam.
6. Most of the patients are primigravida constituting about 48.33%
7. Sickle cell trait is the common hemoglobinopathy observed in our study

population.

8. Common obstetrical complications seen are preeclampsia and oligohydramnios. 11.6% had preterm labor and 15% had IUGR. Anemia was observed in81.67% and blood transfusions are more common in sickle cell disease.
9. LSCS was the common mode of delivery and obstetrical causes are the common indications.
10. Most of the patients carried till term and majority of patients had live births.
11. Most common neonatal complication was LBW.
12. Maternal mortality was 3.33%. Patients were known cases of sickle cell disease who succumbed to acute chest syndrome with ARDS and sepsis with AKI.
13. Neonatal mortality was observed to be in 3.7%. There were 54 live births.
14. Though incidence of the thalassemia minor is low in our study, the outcome of pregnancy in these variants is not a major obstetrical concern.

15. Pregnancy in sickle cell disease has various maternal, obstetrical and medical complications. So a multidisciplinary approach is essential to manage a pregnancy with sickle cell anemia.

DISCUSSION

Hemoglobinopathies are inherited disorders of red blood cells. Being an important cause of mortality and morbidity, they impose a burden on health sector and families. In our study since sickle cell anemia is most common hemoglobinopathy, we have compared to various other studies who have studied the same population groups.

INCIDENCE OF HEMOGLOBINOPATHIES IN VARIOUS STUDIES.

STUDIES	PERCENTAGE IN THEIR STUDY
Anahita et al [41]	0.86
Varsha kose et al[43]	1.31
D'Couth **[42]**	0.15
Port Harcourt [49]	0.2
Our study	0.48

Incidence of hemoglobinopathies in different studies showed a varied difference according to the location, number of patients followed up, incidence of a particular hemoglobinopathy in that area.

- In our study incidence is about 0.48% which is similar to

  Anahita et al study which is about 0.86%

- Varsha kose et al studied the incidence of Sickle cell disease which is found to be about 1.31 in that region.

DISTRIBUTION ACCORDING TO AGE

Most of the patients with hemoglobinopathies in pregnancies are young age group between 20 to 30 yrs.

 In our study they constitutes about 93.32%. This is similar to other studies like Smita

D couth et al and Varsha Kose et al which showed 79.14 and 84.21 % respectively.

• This incidence of young age is probably due to early marriages in the low socioeconomic groups and early conception.

COMPARISON ACCORDING TO RESIDENTIAL AREA

Majority of the patients belongs to tribal populations of the India.

- In our study about 78.33% are from tribal populations of Visakhapatnam.
- These are similar to other Indian studies like Smita D' Couth and Varsha Kose. • About 90.27% are from tribal populations of districts of Wayanad in Smita D'Couth et al
- In Varsha Kose et al a total of 90% population belonged to scheduled caste and tribes.
- This is probably due to consanguineous marriages in the majority of tribal populations of India.

DISTRIBUTION ACCORDING TO GRAVIDA

Majority of the women diagnosed with hemoglobinopathy are primigravida.

STUDY	PERCENTAGE
Anahita Chauhan et al[41]	43.3
Elenga et al [51]	46.8
Varsha Kose et al [43]	40.35
Our study	48.33

- In our study about 48.33% i.e about 29 patients are primigravida , followed by second gravida who constituted about 38.33%.
- The incidence of primigravida in our study is similar to other Indian studies like Anahita et al and Varsha Kose et al who reported 43.3 and 40.35 % of primigravida in their studies.

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INCIDENCE OF SICKLE CELL TRIAT COMPARING TO OTHER STUDIES

- In our study most common hemoglobinopathy observed is Sickle cell trait ; constitutes about 56.66%
- In other Indian studies who studied Sickle cell disease in their regions reported sickle cell trait to be most common hemoglobinopathy observed .
- SCT constitutes about 44.44% Smita D 'Couth, 77.78% in Ashwini et al and 85.96 % in Varsha kose et al study.

AUTHOR	PERCENTAGE
D'Couth[42]	44.44
Ashwini G[46]	77.78
Varsha K[43]	85.96
Our study	56.66

ABORTIONS AND STILL BIRTHS COMPARING TO OTHER STUDIES

Abortions and stillbirth constitute about 6.66% in our studies.

- Other studies also reported similar rates of abortions and stillbirth , about 10% in Daigavane et al study , 9.90% in Desai et al study.
- Hemoglobinopathies are an important cause of early pregnancy loss and other neonatal complications.

PERCENTAGE OF PREECLAMPSIA IN COMPARISON TO

OTHER STUDIES

- Preeclampsia constitutes about 18.33% in our study which is similar to Sonwane S et al 20%.

Hypertensive disorders are common in hemoglobinopathies.

STUDIES	PERCENTAGE
Sonwane S et al [55]	20%
Acharya N et al [56]	25%
Elenga N et al [51]	11%
Our study	18.33%

PERCENTAGE OF SEVERE ANEMIA COMPARING TO

OTHER STUDIES

- Severe anemia Hb < 7gm% is about 21.67%. I.e about 13 patients presented with severe anemia.

In Daigavane et al study the percentage of severe anemia is 23.30%

- In Desai et al study in SCD population severe anemia accounts to 22.10% which is similar to our study.

MODE OF DELIVERY

Most common mode of delivery in our study is LSCS which accounts for

61.40% This is similar to other studies like Anahita et al 50%, Sonwane S et al

64%, Ashwini G et al 51.19%

CONCLUSION

1. Pregnancy with a hemoglobinopathy is a high risk condition which needs a specialist care and a multidisciplinary approach for its management.
2. Proper preconception counselling, awareness of the condition, prenatal diagnosis, prompt evaluation and management of the complications is needed to reduce maternal and neonatal morbidity.
3. Active screening programmes of population with high risk need to be implemented in health care to identify, counsel, and manage the condition.
4. Hemoglobinopathies are an area of future research in India and various genomic technologies play a role in the prenatal diagnosis to reduce the burden on health care and improve maternal and neonatal health status.

LIMITATION:

Limitation of the study is less sample size as the study is done in COVID Pandemic

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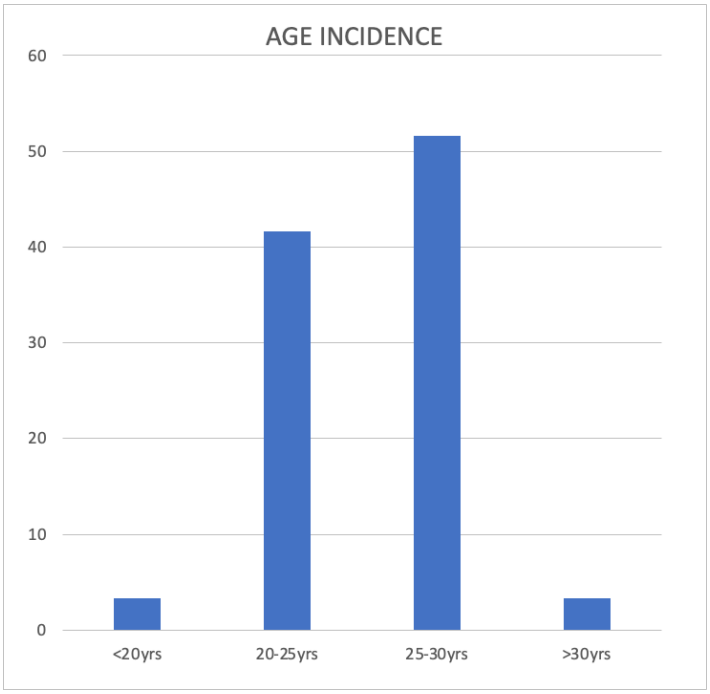
TABLES AND FIGURES:

DISTRIBUTION ACCORDING TO AGE



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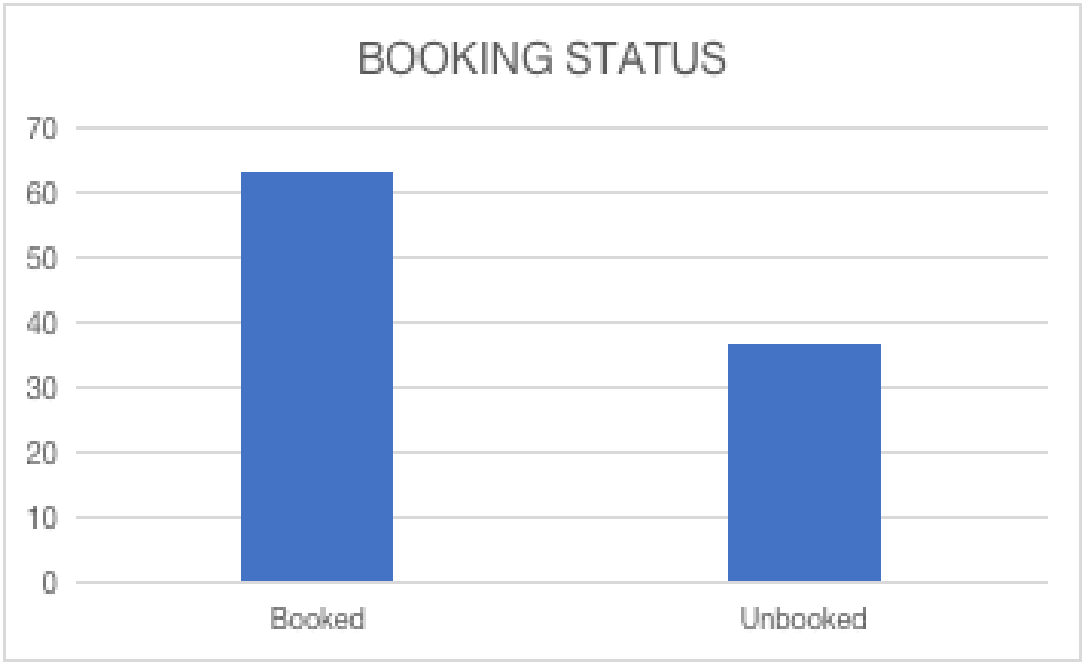

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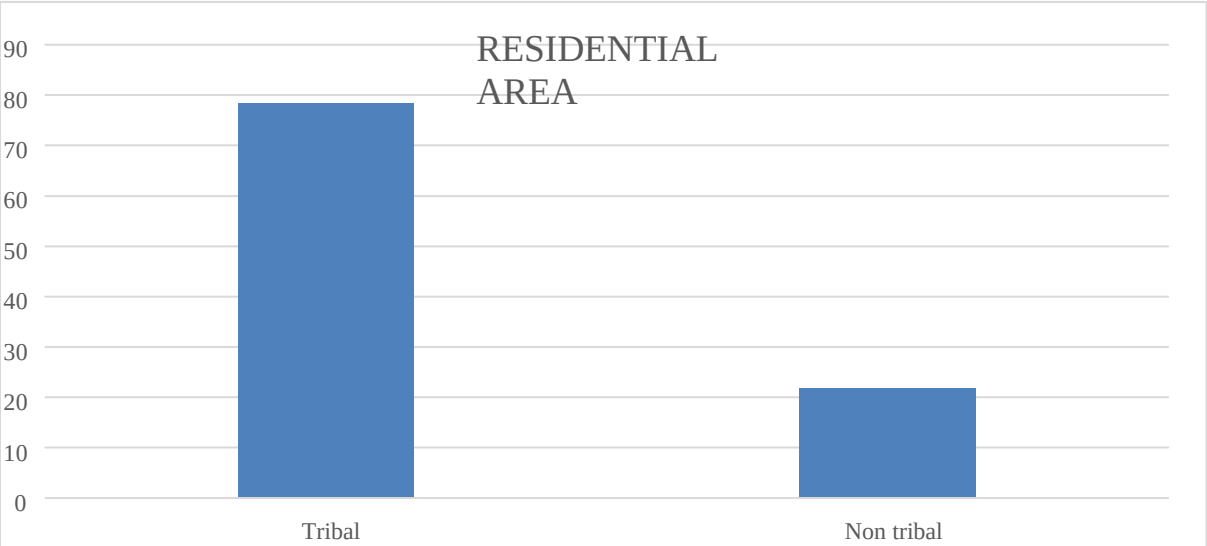
DISTRIBUTION ACCORDING TO RESIDENTIAL AREA



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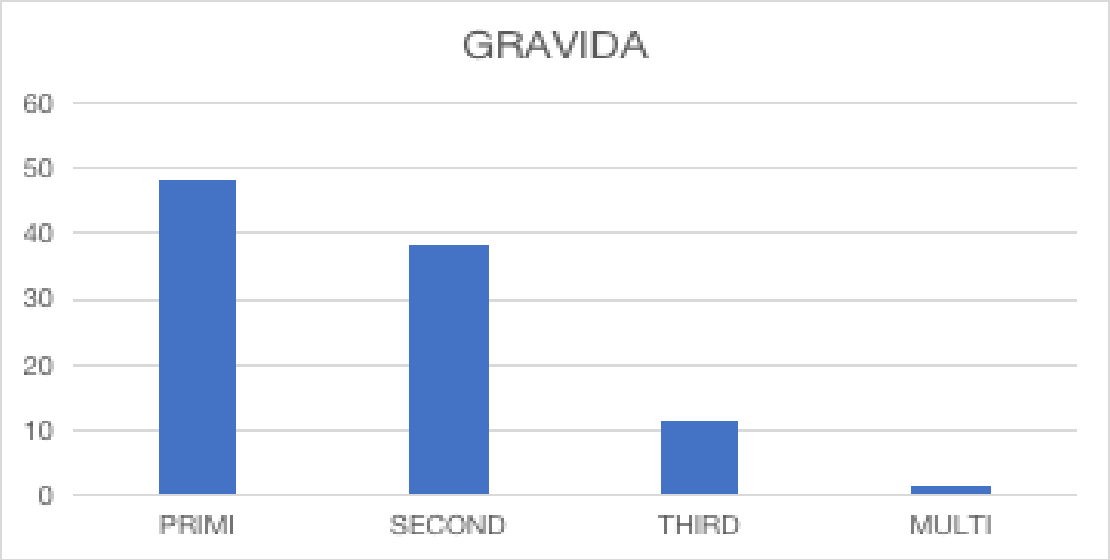

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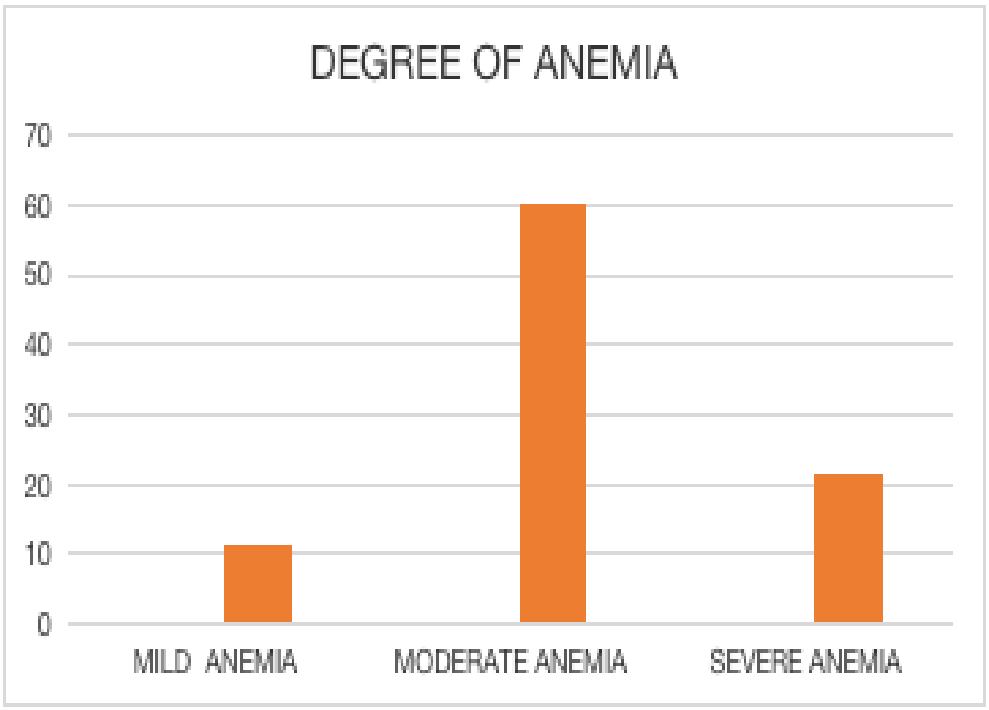
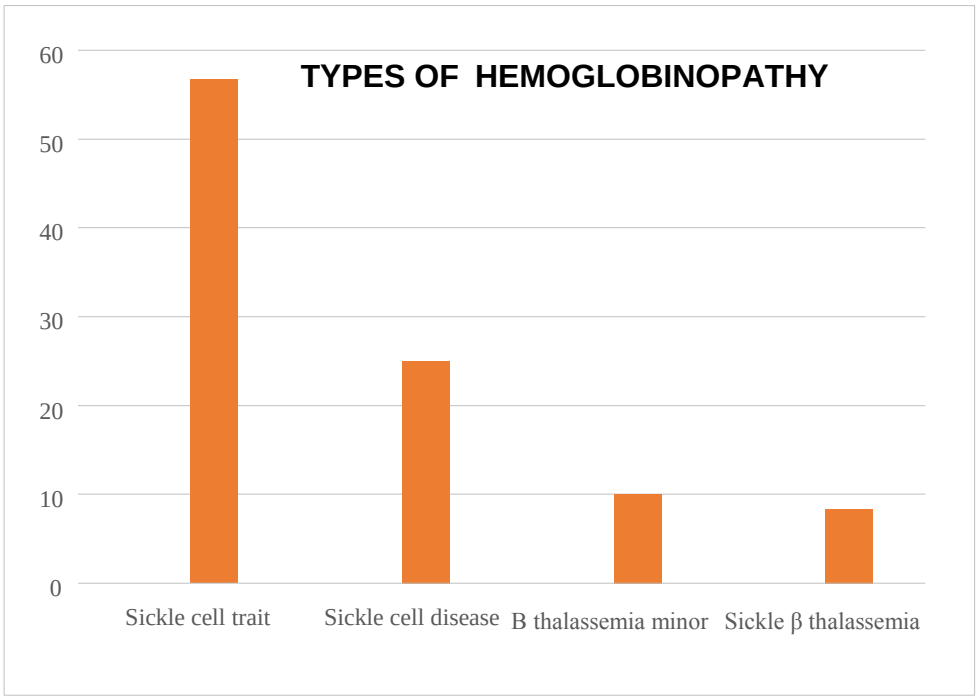
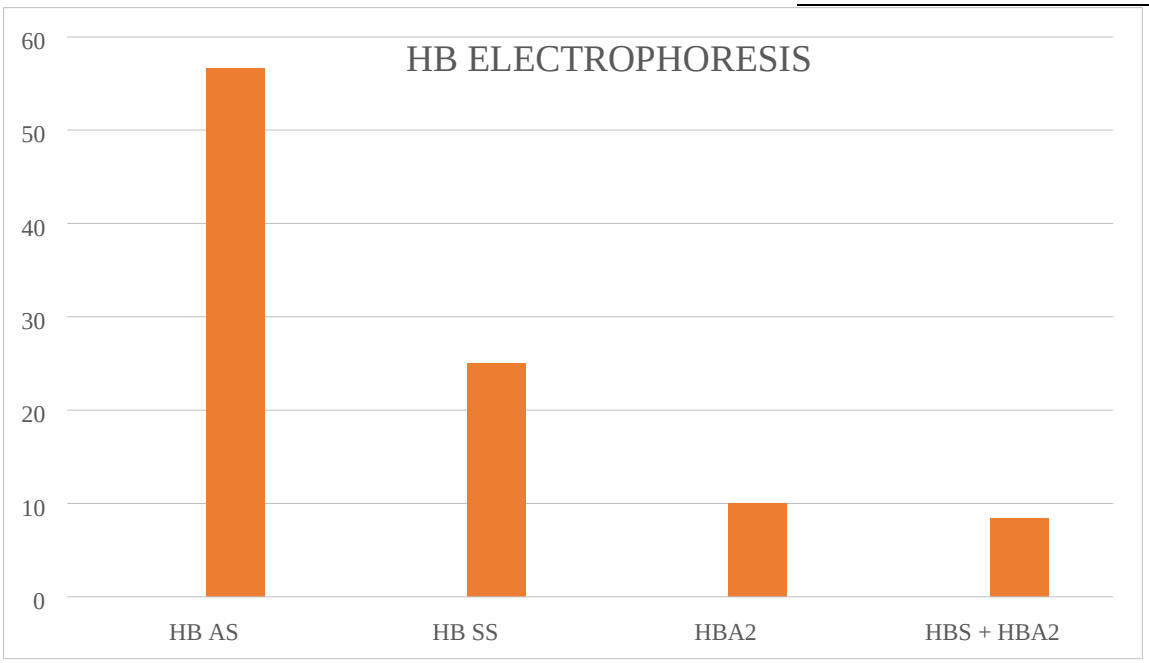
ACCORDING TO TYPE OF HEMOGLOBINOPATHY

DISTRIBUTION ACCORDING TO DEGREE OF ANEMIA

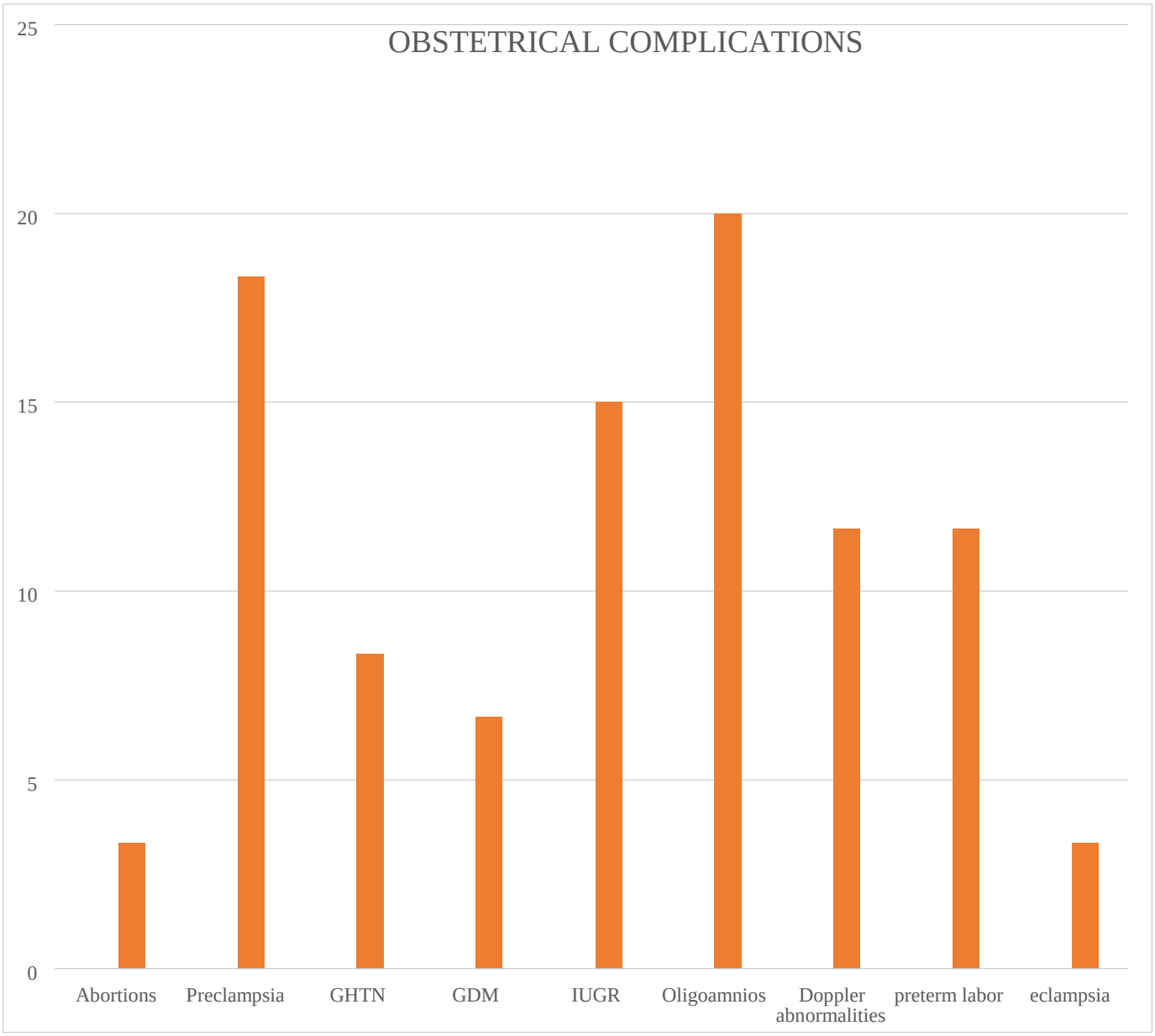




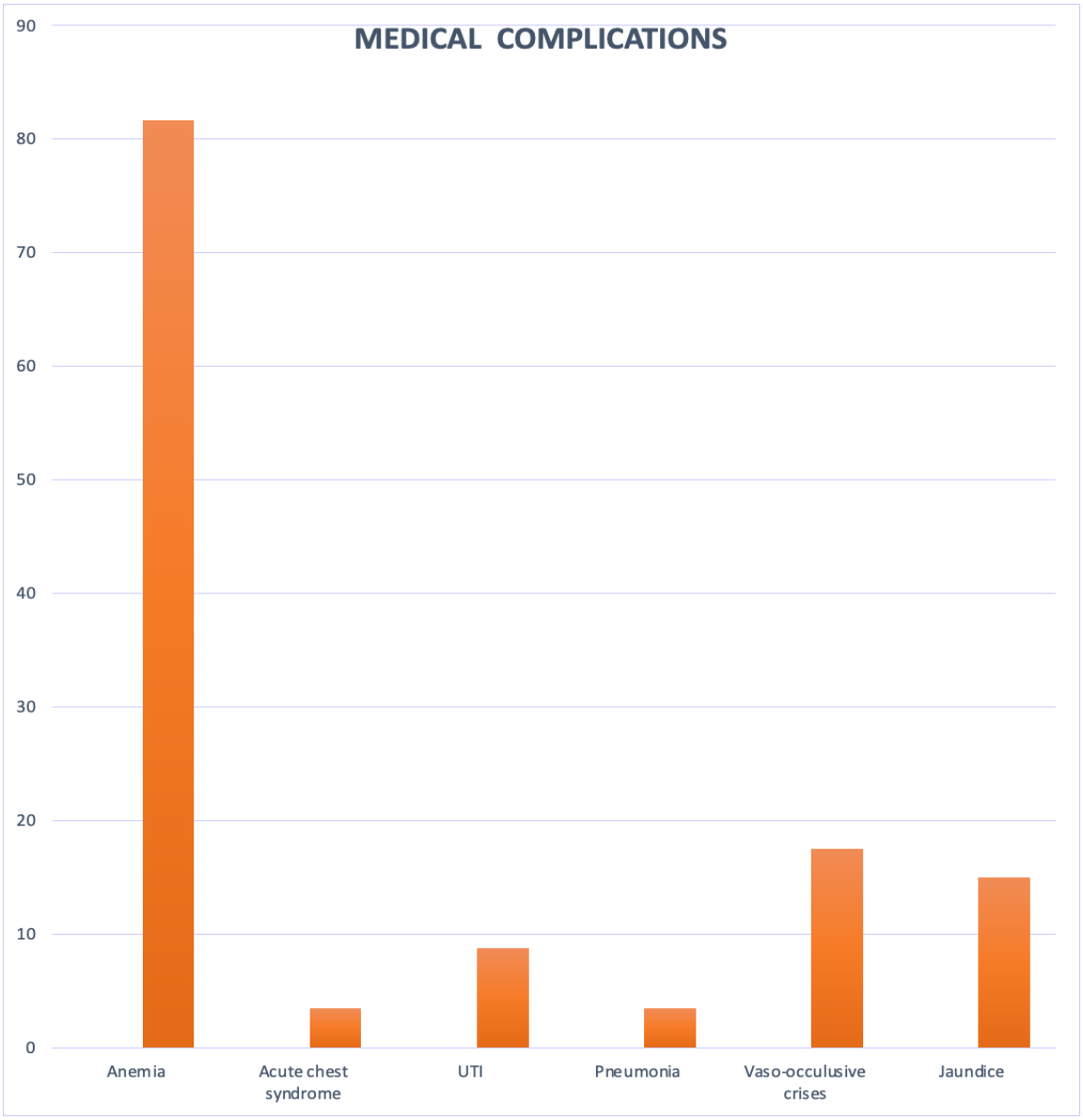
ACCORDING TO HB ELECTROPHORESIS REPORT



OBSTETRICAL COMPLICATIONS



MEDICAL COMPLICATIONS



COMPLICATIONS