International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Thakor RR et al. Int J Reprod Contracept Obstet Gynecol. 2022 Dec;11(12):3364-3367
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20223132

Original Research Article

Maternal outcome in pregnancy with sickle cell trait haemoglobinopathie

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Received: 16 October 2022
Accepted: 11 November 2022

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ABSTRACT

Background: Sickle cell trait, the heterozygous state for sickle cell disorders (SCD), which is associated with various obstetrical and non- obstetrical complication. Our objective was to study the pregnancy outcome in women with sickle cell trait.
Methods: A prospective observational study was conducted collecting data from medical records of around 40 consecutive consenting subjects admitted in a tertiary health care center of south Gujarat over a period of May 2020 to April 2021 after Human Research Ethics Committee (HREC) approval.
Results: In our study majority of the subjects (52.5%) belonged to age group of 18-25 years, majority (62.5%) of subjects were belonged to tribal population. Majority (92.5%) of subjects in our study diagnosed as sickle cell trait post -conceptional. 67% of subjects had various antenatal maternal morbidity among them anemia (45%); preterm labour (12.5%); hypertensive disorder (7.5%) and respiratory failure (2.5%). 65% of our subjects were delivered vaginaly. 5% of subjects had post- partum complication.
Conclusions: Though sickle cell trait is considered as a low risk factor during pregnancy, expansion of SCT screening and educational efforts, the availability of reproductive technologies, and the increasing research on clinical complications of SCT have important implications for reproductive and genetic counselling guidelines.

Keywords: Sickle cell trait, Maternal outcome, Sickle cell disorders

INTRODUCTION

Sickle cell trait is heterozygous form of sickle cell disease. Sickle cell trait is more prevalent in people who are of African-descent and also whose ancestors come from tropical and sub-tropical regions where malaria is endemic.[1] Nowadays because of increased connectivity and migration of people, it has become a disease of global importance.[2] Worldwide, it is estimated that there are 300 million people with sickle cell trait and one-third of this number are in sub-Saharan Africa.[3] India has also a very huge population of tribal community about 18 crore and expected to have 1.80 crore sickle cell trait and 14 lakhs of sickle cell disease.[4] This shows the big burden on the public health of India. Sickle cell trait has been reported to be associated with a variety of maternal and fetal complications during pregnancy or puerperium.

METHODS

An observational study was conducted collecting data from medical records of around 40 consecutive consenting subjects admitted in a tertiary health care centre of south Gujarat over a period of May 2020 to April 2021 after Human Research Ethics Committees (HREC) approval. All women with sickle cell trait pregnancy delivering in tertiary health care centre of South Gujarat were enrolled in this study. All mothers and babies were followed till discharge from hospital.

Sample size

Previously it was estimated to 100 subjects, but because of 1st wave of COVID-19 pandemic its reduced to 40 consecutive subjects.

Inclusion criteria

All consenting postnatal mothers up to 42 days post-partum having sickle cell trait admitted in obstetrics department of tertiary care hospital.

Exclusion criteria

Mothers with sickle cell disease and negative sickle trait were excluded.

RESULTS

A total of 40 pregnant women with sickle cell trait anemia were identified during the study period. Baseline characteristics of all the women in the two groups were noted as shown in Table 1.

Table 1: Baseline variables (N=40).

Variables	N (%)
Age (years)	
18-24	21 (52.5)
25-35	19 (47.5)
>35	0
Socioeconomical class	
Upper	0
Upper middle	0
Lower middle	3 (7.5)
Upper lower	25 (62.5)
Lower	12 (30)
Parity	
Primigravida	17
Multigravida	23
Locality	
Urban	32 (80)
Rural	8 (20)
Diagnosis of sickle cell anemia	
Preconceptional	0
Postconceptional	37 (92.5)
Postnatal	3 (7.5)

The mean age of our subjects was 24.05 years. Most of the subjects (52.5%) belonged to age group of 18-25 years. The probable change of such trend can be due to early marriage, good fertility. 47.5% subjects belonged to age group of 25-35 years; no subject belonged to >35 year of age. Majority (62.5%) of subjects belonged from upper lower socio- economic class as most of the subjects were from urban locality; 30% of subjects from lower class and 3% of subjects from lower middle class according to modified Kuppuswamy classification. From 40 subjects, 17 (42.5%) were primigravida and 23 (57.5%) were multigravida. 80% (32) subjects were from urban locality and 20% (8) from rural area. 37 (92.5%) of subjects in our study diagnosed postconceptional (Table 1).

Maternal antenatal and postnatal variables are shown as in Table 2. Out of 40 subjects, majority 75% were admitted to hospital with gestational age >37 weeks. And remaining 25% were with gestational age <37 weeks; 20 % between 34-37 weeks and 5% between 22-34 weeks. Mean hemoglobin level in our study subjects was 9.64 gm%. 22 (55%) of subjects had hemoglobin level 10-10.9 gm%; 32.5% had hemoglobin level between 7-9.9 gm% (moderate anemia) and 12.5% had hemoglobin <7 gm% (severe anemia). Most common complication was anaemia (45%); in which 32.5% of subjects had moderate anemia and 12.5% of subjects had severe anemia. 2nd most common complication was preterm labour (12.5%). And 3rd most common complication was hypertensive disorder 7.5%; in which 2 subjects (5%) had gestational hypertension and 1 subject (2.5%) had severe pre-eclampsia. 26 (65%) of our subjects were delivered vaginaly; 40% had FTND and 25% had PTVD.

Remaining 35% of subjects were delivered by cesarean section. 5% of subjects had post-partum haemorrhage.

Table 2: Maternal antenatal and postnatal variables (N=40).

Variables	N=40 (%)
Gestational age at delivery(weeks)	
<22	0
22-34	2 (5)
34-37	8 (20)
37-42	30 (75)
>42	0
Haemoglobin level	
10-10.9	22 (55)
7-9.9	13 (32.5)
<7	5 (12.5)
<4	0
Antenatal complication	
Anemia	18 (45)
Htn disorder	3 (7.5)
Preterm labour	5 (12.5)
Respiratory failure	1 (2.5)
Mode of delivery	
Vaginal delivery	26 (65)
Lscs	14 (35)
Instrumental delivery	0
Post-partum complication	
PPH	2 (5)

DISCUSSION

South Gujarat is one of the high prevalence parts for sickling positive cases. The disease is commonly seen in

tribal population (The Dhodia, Dubla, Kukna, Gamit, Vasava, Chaudhary, Halpati, Varli, Kokni, Kathodi, Kolcha, and Kotwadia). With more awareness about the disease in these area as well as in urban areas and better treatment options and facilities more females are reaching the child bearing age. This has led to an increase in the number of pregnant women reaching for institutional delivery.

In our study we have done sickling test in each antenatal woman at her first visit. If sickling test was positive than Hb electrophoresis was advised to them to know the genotype, sickle cell disease (SS pattern) or sickle cell trait (AS pattern). We also included those women who had documented Hb electrophoresis report from outside. In 1-year study period we identified total 40 pregnant women with sickle cell trait. There were 5745 deliveries in the hospital. It gives a rate of 0.69%.

In our study out of total 40 women,55% were tribal population and 12.5% were Muslims. In a study Sonwane et al [(6)], study group consisted of 118 pregnant women, 25 women (21.18%) were sickle cell disease and 93 women (78.81%) were sickle cell trait.

In our study, majority of subjects (80%) were from urban locality. This alteration explains rising trend of inter-cast marriage and increased incidence of sickle cell haemoglobinopathies in non- tribal population. And in our study, all the subjects were diagnosed as sickle cell anemia in post conceptional and in post-natal period. So, it is necessary to strengthen screening of sickle cell anemia in pre-conceptional period and also need to improve antenatal screening in rural area as well as urban areas.

In our study out of total 40 women with sickle cell trait only 5 women (12.5%) had Hb less than 7 gm/dl, 13 women (32.5%) had 7-9.9 gm/dl, 22 women (55%) had Hb 10-10.9 gm/dl. So, anemia was identified as a major morbidity in our study. That's why, early detection and iron studies can minimize future need of blood transfusion and its consequences. In Kose et al study out of total 49 women with sickle cell trait, 3 women (6.12%) had Hb less than 7 gm/dl, 20 women (40.81%) had 7-10 gm/dl, 20 women (40.81%) had Hb 10-11 gm/dl.[7] In the study of Sonwane et al, out of total sickle cell trait women 22.58% women had Hb less than 8 gm/dl, 72.04% women had 8-10 gm/dl, and 5.37% had Hb more than 10 gm/dl. In a study by Couth et al, 100% moderate to severe anemia in HbSS women and only 46.8% women with AS pattern were anemic.[5]

In our study, 26 (65%) had full term normal vaginal delivery, 5 women (12.5%) had preterm delivery, 35% had lower segment caesarean section. In the Kose at al study women with AS pattern (49 women), 18 (36.73%) had full term normal vaginal delivery, 8 women (16.32%) had preterm delivery, 34.69% had lower segment caesarean section.[7] So, LSCS rate was higher than normal population. In a study of Couth et al women with sickle cell haemoglobinopathy have been found to have higher risk for preterm delivery.[5] According to Desai et al incidence of preterm birth was as high as 44-45%.[8] These observations are similar to Sonwane et al where preterm deliveries in AS group (30.10%).[6]

In our study there were no maternal mortality. Most of the women were unaware of pre conceptional counseling. Most of the women detected sickling positive first time during antenatal investigations. They were asymptomatic. Most of the women had pregnancy without any complications.

CONCLUSION

As sickle cell trait is heterozygous state, pregnant women with sickle cell trait can be managed at peripheral health facilities with minimal morbidity and mortality. 80% of subjects from urban locality and diagnosed postconceptional, so need to strengthen screening programs in urban population as well. Though sickle cell trait is considered as a benign condition, expansion of sickle cell trait screening and educational efforts, the availability of reproductive technologies, and the increasing research on clinical complications of sickle cell trait have important implications for reproductive and genetic counselling guidelines.

ACKNOWLEDGMENTS

Authors would like to acknowledge obstetrics and gynecology department staff, all participants for their support during study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Thakor RR, Patel FB, Chaudhary M, Shrivastava A. Maternal outcome in pregnancy with sickle cell trait haemoglobinopathie. Int J Reprod Contracept Obstet Gynecol 2022;11:3364-7.