

Original Articles

Pregnancy outcome in women with sickle cell trait

Ilham M. Hamdi, MRCOG, FRCOG, Karri S. Kamakshi, DGO, DNB, Eid A. Ghani, BCom, DDS.

ABSTRACT

Objectives: The aim of the study is to assess the pregnancy outcome among Omani women with sickle cell trait (SCT), and to compare it with a control group of Omani women with normal hemoglobin.

Methods: Relevant data of both groups was obtained from labor room records, patient files and computerized records at the Nizwa Hospital, Dakhliya Region, Nizwa, Oman from January 1999 to July 2000. Available data was analyzed.

Results: Three thousand, five hundred and one pregnant Omani women were included in this study, 319 had SCT

(9.1%), the average age was 27 years in both groups, and 51% were primigravida. There was an increase in the incidence of anemia in the SCT women. The incidence of abortion and neonatal death in previous pregnancies was significantly increased among SCT women.

Conclusion: Pregnant women with SCT need special care and attention during pregnancy, labor, puerperium and surgery. They should be identified early to prevent complications such as anemia, infection and fetal wastage.

Saudi Med J 2002; Vol. 23 (12): 1455-1457

Sickle cell trait (SCT) is a heterozygous state (AS) genotype of abnormal hemoglobin S (HbS).¹ Patients with the trait are rarely anemic, and are usually asymptomatic and in good health.² They are hematologically normal with normal red blood cells on peripheral smear.¹ However, the stress of pregnancy modifies the situation. The sickling crisis in SCT women may occur in cases of extreme anoxia, dehydration, acidosis, and vigorous exertion at high altitudes.^{2,3} The impaired oxygen supply and sickling infarct in the placental circulation may cause high fetal loss, miscarriage, and preterm labor. The aim of the study is to determine the incidence of SCT and to assess the pregnancy complications and neonatal outcome among Omani women.

Methods. We analyzed the data obtained from the labor room records, patients' files, and

computerized records, at the Nizwa Hospital, Dakhliya Region, Nizwa, Oman, surrounding peripheral hospitals and health centers. A standard protocol is applied for all antenatal clients, complete blood count and sickling test was carried out routinely. If sickling test was positive then hemoglobin electrophoresis was carried out. Demographic data, detailed history, complications, and outcome of previous pregnancy were taken. Other routine antenatal tests were carried out. Three thousand five hundred and one pregnant Omani women were included in the study. Three hundred and nineteen had SCT, and the control group was made up of 3182 women with normal hemoglobin. The total number of pregnancies was 1720 in SCT group and 16973 in the control group. Student t-test, proportion test and Chi-test were used for statistical analysis. $P < 0.05$ was taken as significant.

From the Department of Obstetrics & Gynecology (Hamdi, Kamakshi), Nizwa Hospital, Regional Health Information Office (Ghani), Al-Dakhliya Region, Nizwa, *Sultanate of Oman*.

Received 21st May 2002. Accepted for publication in final form 31st July 2002.

Address correspondence and reprint request to: Dr. Ilham M. Hamdi, Senior Consultant & Head of Department, Obstetrics & Gynecology, Nizwa Hospital, PO Box 1222, PC 611, *Sultanate of Oman*. Tel. +968 439363. Fax. +968 439255. E-mail: nowfelilham@hotmail.com

Pregnancy outcome in sickle cell trait ... Hamdi et al

Table 1

Pregnancy outcome	Total pregnancy achieved by		Significance
	Sickle cell trait %	Control %	
Abortion	4.6	2.6	P<0.05
Intrauterine deaths	1.3	1.1	P>0.05
Neonatal deaths	1.6	0.7	P<0.05
Congenital anomaly	0.2	0.1	P>0.05

Table 4

Birth weight (grams)	Sickle cell trait %	Control %
<2000	3.7	4.2
2000 - 2500	10	10.4
>2500 - 3000	37.9	38.8
>3000 - 3500	35.7	33.7
>3500 - 4000	11.2	10.6
>4000	1.2	2

Table 2

Antenatal problems	Sickle cell trait %	Control %	Significance
Pregnancy induced hypertension	6.8	8	P>0.05
Chronic hypertension	0.6	0.4	P>0.05
Diabetes	4.3	5.8	P>0.05
Intrauterine growth retardation	6.3	6.6	P>0.05
Oligohydramnios	2.8	1.8	P>0.05
Polyhydramnios	0.3	1.5	P>0.05
Anemia	41.4	25.2	P<0.05
Urinary tract infection	2.2	1.7	P>0.05

Table 5

Delivery outcome	Sickle cell trait %	Control %	Significance
Total vaginal section	90.5	89.5	P>0.05
Cesarean section	9.4	10.4	P>0.05
Abruption placenta	1.2	0.7	P>0.05
Intrauterine fetal death	0.6	1.6	P>0.05
Neonatal death	0.9	0.7	P>0.05

Table 3

Gestational age (weeks)	Sickle cell trait %	Control %
<37	7.8	8.8
37 - 38	27.5	35.9
>38 - 40	55.7	48
>40 - 42	8.7	7.2
>42	-	-

Table 1 - Previous pregnancy outcome in sickle cell trait and controls.

Table 2 - Prevalence of antenatal complications in sickle cell trait and controls.

Table 3 - Gestational age at delivery in both groups of women.

Table 4 - Birth weight of babies versus sickle cell trait positive.

Table 5 - Delivery outcome in sickle cell trait and controls.

Results. The incidence of SCT positive Omani women was 319 (9.1%), the average age was 27 years in both groups, and 51% of women in both groups were primigravida. The total number of pregnancies achieved in both groups was the same, approximately 5. The incidence of previous abortions and neonatal deaths was significantly high in SCT women (**Table 1**). Anemia was more common in the SCT group than in controls (41.4 versus 25.2%, $P < 0.05$), but the other complications of pregnancies were equally common in both groups. (**Table 2**). As it will be seen from **Table 3**, there was no difference in gestational age between the 2 groups, or in the birth weight of the babies (**Table 4**). Delivery outcomes were also similar in both groups. (**Table 5**).

Discussion. There are reports that SCT (genotype AS) is associated with increased risk of complications of pregnancy, and with fetal wastage.^{2,3} It may also be the cause of increased mortality of neonates.^{2,4} Three thousand five hundred and one Omani women were enrolled in the present study. Three hundred nineteen (9.1%) of them were positive for SCT (the figure is similar to that reported by Larrabee and Monga,⁵ but higher than reported by Sejekan et al⁶). In our study, there was a highly significant increase in the rate of previous abortion in SCT group compared to Sejekan et al,⁶ which was not significant. Previous neonatal death was significantly higher in SCT women; this is similar to the findings published by Sejekan et al.⁶ A statistically significant increase in the incidence of anemia among the SCT group of women that accords with the reports of Larrabee and Monga,⁵ and by Sejekan et al.⁶ The incidence of pregnancy induced hypertension; intrauterine growth retardation, diabetes, polyhydramnios and oligohydramnios are

almost the same in both groups. These results were similar to the findings published by Sejekan et al,⁶ Schulman⁷ and Whalley et al.⁸ Intrauterine fetal death and neonatal mortality rates were the same in both groups. Similarly, there was no statistical significant increase in abruptio placentae and the cesarean section in both groups, unlike the results published by Sejekan et al,⁶ and Pritchard et al.⁹

In conclusion, though SCT is generally benign, women with the trait need special care and attention during stressful situations like pregnancy. They should be identified early to prevent complications such as anemia, infection and fetal wastage. Dehydration, anoxia and infection should be avoided or treated promptly during pregnancy, labor, surgery and postpartum.

References

1. Noguchi CT, Schechter AN, Rodgers GP. Sickle cell disease pathophysiology. *Baillieres Clin Haematol* 1993; 6: 57-81.
2. Lops VR, Hunter LP, Dixon LR. Anaemia in pregnancy. *Am Fam Physician* 1995; 51: 1189-1197.
3. Jame DK, Steer PJ, Weiner SP, Gonik B. High risk pregnancy: management options. London (UK): WB Saunders Company; 1994. p. 355-358.
4. Baill IC, Witter FR. Sickle cell trait and its association with birth weight an UTI in pregnancy. *Int J Gynecol Obstet* 1990; 33: 19-21.
5. Larrabee KD, Monga M. Women with sickle cell trait are at increased risk for pre-eclampsia. *Am J Obstet Gynecol* 1997; 177: 425-428.
6. Sejekan PB, Kaur S, Vaciavinkova V, Krilikowski A. Pregnancy outcome in omani women with sickle cell trait. *Oman Medical Journal* 1999; 16: 10-12.
7. Schulman H. Pregnancy outcome in sickle trait. *JAMA* 1977; 238: 1392-1394.
8. Whalley PJ, Pritchard JA, Richard SR. Sickle cell trait and pregnancy. *JAMA* 1963; 186: 66-69.
9. Pritchard A, Cunningham FG, Pritchard SA, Mason A. On reducing the frequency of severe abruptio placentae. *Am J Obstet Gynecol* 1991; 165: 1345-1351.