

## **The Relationship of Contraceptive Methods with the Sickle-cell Anemia Crises among the Reproductive aged Women in Khuzestan- Iran**

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### **Abstract**

**Introduction:** Many sexually active women with sickle-cell anemia can be pregnant and tend to use contraceptive methods. Access to an effective family planning is important for women with sickle-cell anemia, because their pregnancy can be more problematic.

**Objective:** This study aimed to evaluate the different methods of family planning among women with sickle-cell anemia and their relationship with the crisis's onset of these diseases.

**Methods:** This is a cross-sectional study which was conducted on 50 reproductive age women with sickle-cell anemia referred to Shafa hospital in Ahvaz during 2011-2012. Demographic data and patients' telephone numbers were extracted by referring to the medical records archive of patients. Data pertaining to the blood tests and electrophoresis of patients were extracted from the records. A questionnaire pertaining to the demographic data, history of midwifery and disease and sickle-cell anemia crises was completed via a telephone interview with the patient. Data were analyzed using the descriptive statistics, chi-square and Spearman's Rho test for assessing the relationship between sickle-cell anemia crises and contraceptive methods.

**Results:** The most common contraceptive methods used by patients were; withdrawal (34%), barrier method (30%), tubal ligation (16%), oral contraceptive pills (12%), intra uterine device (2%) and Depot-Medroxy Progesterone Acetate (DMPA) (2%) respectively. Four percent of women did not use any contraceptive method. There was not any significant relationship between sickle-cell anemia crises and contraceptive methods. However, when we classified contraceptive methods to two groups of hormonal and non- hormonal methods, a significant relationship was found between crises of sickle-cell anemia and hormonal and non-hormonal methods.

**Conclusion:** Results of this study showed that there is no relationship between contraceptive methods and sickle-cell anemia crises, but showed a significant relationship between crises and hormonal and non- hormonal methods. These findings require confirmation in other studies with larger sample size.

**Keywords:** Sickle-cell anemia, Crises of Sickle-cell anemia, Contraceptive methods

## Introduction

The disease of sickle cell is the most common structural disorder of hemoglobin (1). This disease presents as a chronic hemolytic anemia, (2) and has affected millions of people worldwide (1). Major expressions of the disease are: ischemic attacks or infarction of central nervous system, spleen, bones, liver, kidneys and lungs (1). Other disorders can also include acute chest syndrome and invasive infections (3). 20 neonates out of every 1,000 newborns, which are born in this world, are with sickle-cell anemia, and three-quarters of the infants live in the Africa. However, sickle cell disease is not confined to Africa (5 and 4). Sickle cell disease in the scattered form has been observed among the Arabian indigenous people in the rim countries and islands in the Persian Gulf (6). Iran is situated in the geographic range of the hemoglobinopathy, and reports on cases of the disease, especially in southern Iran have confirmed it (7). Patients with sickle-cell anemia are 20 percent of all statistics of patients in thalassemia Center of Ahvaz. In fact, it can be said that sickle-cell anemia is the most common genetic disease after thalassemia, which allocates most patients with hemoglobinopathy to the Shafa Hospital in Ahwaz to itself (8). Family planning counseling and access to effective contraception for women with sickle cell due to problems such as preeclampsia, intrauterine growth restriction, preterm labor, low Apgar score, perinatal mortality, risk of anemia and bacterial Yersinia, cesarean delivery, and induction and prematurity are very important (14-9). Due to such symptoms in women with sickle cell; it is recommended that family size is limited. Therefore, women should have access to an appropriate counsel on safe and effective contraceptive methods (15). In fact, we can say that sickle cell disease is a severe hematologic status which causes special problems in pregnant patients (16). Thus, access to family planning is very important for women with sickle cell, since they are with pregnancy

problems more frequently (17). Sickle-cell anemia is a hereditary disease. Inheritance of hemoglobin S gene from each parent will cause sickle-cell anemia (1). Prevention of the birth of infants with sickle-cell anemia, in addition to promoting community health, causes to reduce the heavy financial burden on the healthcare system and the economy (18).

In the past, women were advised to avoid pregnancy or use permanent methods of termination or contraception of pregnancy (19). New methods of contraception have been developed in recent years that it has adjusted the fertility problems of these women. Although these new methods will allow women for more options, when they are used by a woman with sickle cell disease, concern about their safety is increased (20). Unfortunately, a variety of suggestions about using contraception methods among women with sickle cell has raised concerns about clinical decisions in this area (21, 17). For example, one of the concerns is that women with the disease which use hormonal methods of contraception may be affected by artery stenosis caused by blood clots, or experienced more pain (22).

Some studies suggest that use of hormonal contraceptive can raise venous thromboembolism risk among African-American women, and this increase of risk can be higher among women with cycle trait (24 and 23). The risk rate for thromboembolic in companionship with hormonal methods is more than the combined pills (20). However, there is not a consensus on recommendations regarding the use of oral pills for contraception for women with sickle cell in the world (26, 25). The intrauterine devices are supposed to be such that it should be avoided, because they are associated with uterine bleeding and infection, which can worsen the period of sickle cell disease (26), but it is said that there is no limit for the use of Intra Uterine Device (IUD) releasing levonorgestrel. On the other hand, it has proven that implants cause a

significant improvement in well-being in women with sickle cell, and thus, this method can be safe is to prevent pregnancy in women with sickle cell (27). Similarly, progestin-only methods such as DMPA, are not only safety methods for these women, but also reduce the frequency and severity of bone pain crises (30-28). If Emergency methods of contraception have an indication, then they may be used in some cases. Barrier methods such as condoms are acceptable options for women with sickle cell, and they also have another advantage in the prevention of sexually transmitted diseases (26). Like women without sickle cell disease, diaphragms and cervical CUP may be used and although they are generally less effective, may be satisfactory accompanied by spermicides (31). However, many women with sickle cell who are sexually active, they can become pregnant and tend to use birth control methods (22). Studies show that there are large gaps in the cares of family planning among young women with sickle cell (17). In this study, it is evaluated the relationship between methods of contraception with sickle cell attacks in women of childbearing age in Khuzestan Province.

## **Methods**

This study is a cross-sectional study. The study population included all reproductive aged women of 15-45 years with sickle-cell anemia and its variants, which referred to Shafa Hospital in Ahvaz during year 2011. All women who have had records in Shafa Hospital according to inclusion and exclusion criteria ( $n = 50$ ) were selected. Inclusion criteria included a diagnosis of sickle cell confirmed by a physician and over more than one year from the time of diagnosis, between 45-15 years of age, being marital, sexual relationship with her spouse, married for more than a year, the method of contraception for at least a year, tend to participate in the study; Exclusion criteria included pregnancy, divorce, death of spouse, and menopause. Data of demographic factors were extracted from the records. Some patients referred only to the

thalassemia clinics of Shafa Hospital, and the records of others are filed only during hospitalization, so, records of Thalassemia Clinic of Shafa Hospital and records of hospitalized cases were studied together.

In the present study, demographic data, and diagnosis and telephone numbers of patients were obtained by referring to the archives of the patients' medical records. For more information about blood tests and electrophoresis of patients, medical records were used. Demographic questionnaire, women with sickle cell disease consist of six questions regarding demographic data, three questions about the blood disease history, five questions on the midwifery area history; the table of the pain attacks history in the past year. These tables include the type of attack and reason for hospitalization that includes the joints attack of hands and feet, shoulder and hip, splenic accumulation, stroke, lung infection, other infections, and other complications of disease, diseases unrelated to the original disease, total days of hospitalization and the number of attacks. The questionnaire was completed during telephone interviews with patients who had inclusion criteria and were willing to participate in this study. Total patients were 512 people, including men, women and children, and among them, 50 people were eligible for inclusion. For those hospitalized and those who were not hospitalized, questions about the attacks of sickle cell disease in the questionnaire were completed during the telephone interviews.

After data collection, statistical methods were used to determine frequencies and the mean of the variables. To investigate the relationship between prevention methods and sickle cell attacks, statistical tests include the Spearman's correlation coefficients, rho and chi square were used.

## **Results**

Mean  $\pm$  SD age of the women  $6.10 \pm 33.14$  years were with the minimum of 22 and maximum of 44 years. 56% of patients and 2%

of them were with sickle cell, and sickle trait respectively; and 42% were diagnosed with sickle thalassemia. Demographic characteristics of the study sample are reported in Table 1. In reviewing the midwifery history of the persons, in terms of the frequency of contraception methods, withdrawal method with 34% was the maximum, and then, using condoms, tubal ligation, contraceptive pills, IUD, and injectable ampoules were 30%, 16%, 12%, 2%, and 2% respectively; 4% of persons also did not use any method of contraception.

The studied persons changed their method of contraception, and tried for other methods. Among the previous methods of contraception, the highest frequency is belonged to the contraceptive pills with 44% and then withdrawal method was with. Unknown factors with 35% were the greatest reasons for change the method of contraception, afterwards the fear of pregnancy, physician's recommendation, pain and complications, and others' recommendations were 12.5% and 10%, 7.5%, and 2.5% respectively (Table 2).

**Table 1: Individual Characteristics of Study Samples**

Variables	Number (Percent)
<b>Ethnicity</b>	
Arab	49 (98)
Bakhtiari	1 (2)
<b>Job</b>	
Housewife	49 (98)
Employed	1 (2)
<b>Education</b>	
Illiterate	2 (4)
less than a high school diploma	28 (56)
Diploma	18 (36)
High	2 (4)
<b>Disease</b>	
Cell Cycle	28 (56)
CycleTreat	1 (2)
Sickle Thalassemia	21 (42)

**Table 2: Midwifery History of Study Samples**

Variable	Number (Percent)
<b>Number of Pregnancy</b>	
Null gravida	5 (10)
1-3	32 (64)
4 ≥	13 (26)
<b>Abortion History</b>	19 (38)
<b>Delivery Type</b>	
Natural	23 (46)
Caesarean section	22 (44)
<b>History of unwanted pregnancy</b>	6 (12)
<b>Number of living children</b>	
1-2	26 (52)
3≥	18 (36)
<b>Dysmenorrheal</b>	26 (52)
<b>Irregular periods</b>	11 (22)
<b>Methods of contraception</b>	
DMPA	1 (2)
Oral LD	6 (12)
Condoms	15 (30)
IUDs	1 (2)
A tubal sterilization	8 (16)
Interrupted	17 (34)
Without prevention	2 (4)
<b>Previous methods of contraception</b>	
DMPA	1 (2)
Oral LD	22 (44)
Condoms	2 (4)
Interrupted	16 (32)
Without prevention	9 (18)

**Table 3: Relationship between contraceptive methods and the number of attacks over the past year**

Methods of contraception	Hormonal methods		Non-hormonal methods		The significance level
	Numbers	Percent	Numbers	Percent	
Number of attacks over the past year					
1-3	3	6	15	30	R =0.67
>4-10	2	4	14	28	p<0.001
>11	2	4	14	28	
Total	7	14	43	86	

About the frequency of attacks, 91.9% of patients experienced the attacks of the hand and leg joints. It should be noted that one case had a stroke. It is noteworthy that case used an oral contraceptive when the attack occurred, and she was not aware of her illness, after that sickle cell is diagnosed. Attacks occurred in the shoulder, and hip joints were 42%; lung infection, splenic concentration, and other infections, including urinary tract infections occurred in cases, were respectively 2%, 6%, and 4%. In the days of hospitalization, 42.1% of the patients had no history of hospitalization in the previous year. The minimum number of days in the hospital for participants was three days, and the maximum number was 150 days. Findings in relation to methods of preventing pregnancy and sickle cell attacks showed no significant relationship ( $p<0.05$ ), but when the hormonal and non-hormonal methods of contraception were divided, a significant relationship was seen using the Spearman's test ( $p<0.001$  and  $r=0.67$ ) (table 3).

## Discussion

Sickle cell disease is the most common structural abnormality of hemoglobin that has affected millions of people worldwide. Access to effective family planning methods is important for women with sickle cell, because they are with problems more frequently during pregnancy. In the study, the relationship of the contraception methods with the onset of the sickle cell attacks in the pregnancy aged women was evaluated. The results of this study showed that there is not a statistically significant relationship between methods of contraception and the cycle cell attacks, which it occurs due to being low samples, and thus it was out of researcher's authority. In the study, all patients referred to the clinics were included, and the number of them was limited. However, the results showed there is a statistically significant relationship between the number of the cycle cell attacks in the past and the hormonal and non-hormonal contraception methods. Thus, unlike those who used non-hormonal methods, those who used

hormonal methods, experienced fewer attacks. Other studies show an increased incidence of stroke in patients taking hormonal methods of contraception specially the combined pills (24-22). The reason for this lack of consistency is the low number of samples taking hormonal methods in the study. So that only one person used method of DMPA, and six of them used tablets LD.

The overall pattern of contraceptive methods among subjects in order for prevalence of use were non-hormonal methods of contraception total of 74 percent (including withdrawal method, condoms, tubal ligation and IUDs), hormonal methods of contraception total of 22% (including oral contraception, and injectable ampoules), and finally, 4% of persons had no method of contraception. Among the latter group, one due to the pregnancy and one for primary infertility were not using any method.

Based on this, the study of Knight-madden et al. (2009) in Jamaica was conducted to investigate the contraception methods use among Jamaican women with sickle cell. In this study, 132 women with sickle cell disease were interviewed about methods of contraception. It was found that 64 percent were using a method of contraception. The most common methods were condoms (39%) and DMPA (28%). Among those who did not use contraception methods, 52 percent were not among the concerns raised is that infected women who use hormonal contraceptive methods, may be blocked artery by a blood clot or experience more pain (22). In this regard, Austin et al. (2009) in America, in a study to determine the effectiveness of hormonal methods of contraception on the risk of venous thromboembolism, found that the use of hormonal contraception methods raised the risk of venous thromboembolism among African and American women, and this increased risk may be greater among women with cycle trait (24). Risk for thromboembolic events associated with the use of hormonal methods like combined pills is higher (24 and 20), but there is no consensus on

recommendations regarding the use of oral tablets for the prevention of pregnancy in women with sickle cell in the world (26, 25). This study is consistent with Yoong et al.'s study (1999) in London, in which there is not a general agreement about the use of hormonal methods of contraception (25). Intrauterine devices should also be avoided because they are associated with uterine bleeding and infection, and can be exacerbated disease period (26), but it is said there is not a limit for the use of the levonorgestrel-releasing IUDs (27). On the other hand, it has been shown the implants markedly improve feeling better in the women with sickle cell, are therefore, this method can be safe to avoid pregnancy in women with sickle cell (28). Similarly, progestin single methods such as DMPA for women are not only safety but also reduce the frequency and severity of bone pain crises (30-28). The method of emergency contraception may be used in some cases, if they have an indication. Barrier methods such as condoms are an acceptable option for women with sickle-cell anemia, which another advantage of using it is the prevention of sexually transmitted diseases (26). Despite the dichotomy of results of various studies in the field of prevention methods for women with sickle cell, generalizability of the results requires more research in this field.

### **Conclusions**

Findings in relation to methods of preventing pregnancy and sickle cell attacks showed no significant correlation. However, after dividing the hormonal and non-hormonal contraceptive methods, a significant relationship was found. The overall pattern of contraceptive methods among the subjects shows that non-hormonal methods of contraception are used more than hormonal methods. The findings show despite that there is not conclusive evidence that hormonal contraception methods are associated with complications of sickle cell disease, but there is a conservative, less willing to use these methods compared with non-hormonal methods. The findings need to be confirmed in other studies with a larger sample size.

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