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Contraceptive Methods in Diabetic Women Referring to Government Diabetes Clinics in Northern Iran

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Abstract

Background: Unwanted pregnancies in diabetic women can endanger the mother and the fetus. The present study was conducted to determine contraceptive methods for diabetic women referred to government diabetes clinics in the north of Iran.

Methods: A total of 153 diabetic women referred to government clinics in Guilan were included in this cross-sectional study. A questionnaire made by the researcher regarding personal and social information and information related to contraceptive methods was administered. Data were analyzed analytically using SPSS version 19.

Results: The findings of the present study revealed that 87.6% of diabetic women used contraceptive methods, of which 44.4% utilized low-effective contraceptive methods (withdrawal method and condoms), and 43.2% opted for highly effective contraceptive methods (tubal ligation, oral contraceptive pill, intrauterine device, and vasectomy). Decision regarding the choice of contraceptive methods was mainly made by couples, followed by consultation with a doctor.

Conclusions: A relatively high percentage of diabetic women use less effective contraceptive methods, and the decision to use contraceptive methods is made mainly by couples. Therefore, targeted reproductive health interventions and providing counseling services as part of medical care for diabetic women seem necessary.

Keywords: contraception, diabetes mellitus, family planning services

INTRODUCTION

Diabetes is a common health concern in the world.¹ The World Health Organization statistics show that the number of people with diabetes has increased from 108 million people in 1980 to 422 million people in 2014. This number is expected to increase to more than 600 million people worldwide by 2045.² In 2011, 4.5 million people in Iran were estimated to have diabetes, and by 2030, their number is predicted to increase to more than 9 million people.³ This continuous and substantial increase in the prevalence of diabetes implies the peak of this condition in Iran.⁴ In addition to the increased prevalence of diabetes, which is an important health concern in the world and comes with high health costs,³ management of women's reproductive health, along with the management of diabetes, brings many challenges to healthcare systems.⁵ In diabetic women, reproductive health includes the prevention of pregnancy and preparation for pregnancy at the right and optimal time.⁶

Diabetes during pregnancy is associated with increased risks of maternal and fetal complications, including

miscarriage, preeclampsia, fetal abnormalities and preterm birth, polyhydramnios, and difficult labor due to macrosomia.⁷ Diabetic women can suffer from severe maternal complications, which can also threaten a mother's life, but they are often ignored by women who want to have children.⁸ Experimental and clinical pieces of evidence have shown the relationship between increased risk of congenital abnormalities and miscarriage in diabetic pregnant women to the disturbance in a mother's metabolism during conception and in the organogenesis phase.⁹

Unwanted pregnancy and uncontrolled blood sugar in diabetic women are associated with high rates of maternal and fetal complications and mortality.^{10,11} Therefore, for the reduction of these risks among diabetic women, the disease must be controlled before pregnancy, and appropriate contraceptive methods must be used.¹¹ Highly effective contraceptive methods include tubal ligation (TL), oral contraceptive pills (OCPs), intrauterine devices (IUDs), and vasectomy. By contrast, traditional methods with low effectiveness include withdrawal, periodic abstinence, and condoms.^{6,12,13} Less effective contraceptive methods are unsuitable for diabetic women due to the higher probability of failure.¹⁴ Britton *et al.* showed that more than half of the women with diabetes that they studied either did not use contraceptive methods or used less effective ones.⁶ According to Horwitz *et al.*, women diagnosed with diabetes were less inclined to use contraceptive methods, especially hormonal drugs

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containing estrogen, because of their fear of side effects.¹⁵ According to Stransky et al., women with autoimmune diseases believed that contraceptive methods are unsafe for them due to their underlying health condition, which explains their avoidance of contraceptive methods.¹⁶ Insufficient information and fear of side effects cause diabetic women to inhibit from using contraceptive methods or use less effective ones, such as withdrawal and periodic abstinence.^{6,12,13,17} Thus, scholars should focus on high-effect methods as the unexpected failure of contraceptive methods can increase the risks of congenital abnormalities and spontaneous abortion in diabetic pregnancies.⁹

The recommendation and use of effective contraceptives are challenging for diabetic women and counseling service providers.¹⁵ Diabetic women receive little counseling and guidance in selecting the type of contraceptive method.¹⁸ Therefore, this study aimed to determine contraceptive methods for diabetic women referred to state diabetes clinics in Guilan province, north of Iran. The findings of this research can provide information that can be used to support, guide, and develop programs for diabetic women in reproductive age and offer a foundation for future studies.

METHODS

This research was conducted with the approval of the Research Council of the Research and Technology Vice-Chancellor of Guilan University of Medical Sciences and in compliance with ethical guidelines (407/132/3/P).

The present study is a descriptive, cross-sectional research, with a research population comprising diabetic women referred to government diabetes clinics of Guilan province (diabetes clinics of Razi Hospital and Besat Clinic), north of Iran in 2015.

The sample size (146) was determined based on the results of preliminary work on 25 subjects with a confidence level of 95% and an accuracy of $d = 0.08$. Finally, 153 people were selected as the research sample, with an attrition rate of approximately 5%.

Diabetic women with an age range of 15–49 years, having a spouse in married life, not pregnant, and being fertile were included in the study. Those who were unwilling to cooperate and participate in the research while completing the questionnaires were considered excluded from participating.

A personal–social information questionnaire was used in this research, and it included 13 questions regarding age, weight, height, education, spouse's education, occupation, spouse's occupation, place of residence, family income, type of diabetes, the number of children, complications of diabetes, and source of information about diabetes. The

questionnaire on contraceptive methods was used to obtain answers regarding five questions regarding contraceptive methods, namely, the purpose of using contraceptive methods, consultation and decision-making about contraceptive methods, reasons for not using contraceptive methods, and history of failure to use contraceptive methods. The content validity method was used to determine the validity of the questionnaire. In this regard, a review of related articles was articulated. Then, a questionnaire was prepared, reviewed, and evaluated by ten expert faculty members.

The “minimum values” table compiled by Lawshe was used to determine the content validity ratio (CVR) numerically. The score was calculated based on the relevant formula and compared with the standard value in the table. A content validity index of 0.95 and a CVR of 0.89 were obtained. The reliability of the questionnaire was determined using Cronbach's alpha method, with the reliability coefficient reaching 0.78.

The available sampling method was used by two trained nursing experts to conduct sampling from June 2015 to September 2015 on diabetic women referred to government diabetes clinics in Guilan province (Razi Hospital Clinic and Besat Clinic). The project managers ensured the reliability of nursing experts by holding a briefing first to coordinate data collection and fully explain the research objectives, conditions for accepting the samples, and methods of collecting information to the nursing experts.

The respective clinics were visited daily by the two trained nursing experts. After the informed consent had been obtained and the study's objectives had been explained to diabetic women who met the conditions to participate in the study, the questionnaires were administered to the participants to complete. Data collection was continued to complete the sample size (153 people). All 153 eligible samples were included in the study, and no one was excluded due to refusal to participate.

Medical records were consulted to collect the medical information on the included diabetic women, such as diabetes and its complications. Weight (kg) was measured with the diabetic women having light clothes on and without shoes (seca 755 scale, Hamburg, Germany), and height (cm) was measured without shoes on (seca 206 wall-mounted measuring device, Hamburg, Germany) with an accuracy of 0.1. Body mass index (BMI) was obtained by dividing the subjects' weight (kg) by the square of height (M).

SPSS, version 19 (IBM, United States), was used in data analysis. Descriptive statistics, including frequency and percentage for categorical variables and mean and standard deviation for numerical variables, and inferential statistics, including the Chi-square test, independent t-

test, and Fisher’s exact test, were obtained. $p < 0.05$ was considered significant.

RESULTS

The diabetic women studied had a mean age and standard deviation of 43.75 ± 5.38 years, with an age range of 28–49 years. The mean weight was 74.48 ± 12.46 , the mean height was 159 ± 0.07 , and the mean BMI was 29.29 ± 4.55 . Most participants (45.8%) had a BMI equal to or above 30 and were obese. Table 1 lists other personal and social characteristics of the diabetic women included in the study of the participants.

A significant relationship was observed between the type of contraception used (low effect versus high effect) and the number of children ($p = 0.01$). Those who used low-effect contraceptive methods had more children. A significant relationship was identified between the type of contraception used (low effect versus high effect) and an occupation ($p = 0.02$), with more housewives using low-effect contraceptive methods. The relationship between demographic information and the type of contraceptive methods (low effect versus high effect) used by diabetic women was also determined (Table 2).

A total of 44.4% of diabetic women used low-effective contraceptive methods (withdrawal and condom), 43.2% used high-effective ones (TL, OCP, IUD, and vasectomy), and 12.4% did not use any contraceptive method. Of 19 diabetic women who did not use contraceptive methods, 9 women reasoned because of their husband’s objection, 7 women reasoned because of their desire to get pregnant, and 3 women reasoned because of their fear of side effects. Exactly 14.4% and 73.2% used hormonal contraception (OCP) and nonhormonal methods, respectively. Meanwhile, 13.8% reported experiencing failure in the use of contraceptive methods, 45% of whom utilized the withdrawal contraceptive method. The characteristics of contraceptive methods used by diabetic women are provided in Table 3.

The OCP and non-OCP users had mean ages and standard deviations of 44.41 ± 5.22 and 43.79 ± 5.44 , respectively. The majority of OCP users (54.6%) had primary education. No blood pressure and cardiovascular complications were observed in 72.7% of OCP users and 70.5% of non-OCP contraceptive users. Moreover, no significant difference was observed between the two groups ($p = 0.53$). Among OCP users, 63.6% jointly selected a contraceptive method with their spouse, 18.2% accepted the recommendations of a specialist physician, and 18.2% considered the recommendations of a midwife. The relationship between demographic information and the use of OCP and non-

OCP contraceptives among diabetic women can be found in Table 4.

TABLE 1. Individual–social characteristics of diabetic women referred to government diabetes clinics in Guilan province (N = 153)

Variable	N	%
Age		
<30	5	3.3
31 – 35	10	6.5
>36	138	90.2
Number of children		
No child	12	7.8
1-3	121	79.1
4-6	20	13.1
Place of residence		
Urban	132	86.3
Rural	21	13.7
Education		
Primary	62	40.5
Middle and high school	83	54.3
Academic	8	5.2
Spouse’s education		
Primary	50	32.7
Middle and high school	91	59.5
Academic	12	7.8
Occupation		
Housewife	134	87.6
Healthcare employee	3	2.0
Nonsanitary-medical employee	16	10.5
Spouse’s occupation		
Worker	20	13.1
Self-employment	79	51.6
Healthcare employee	4	2.6
Nonsanitary-medical employee	50	32.7
Family income		
Insufficient	73	47.8
Relatively sufficient	68	44.4
Sufficient	12	7.8
Diabetes		
Type 1	15	9.8
Type 2	138	90.2
Complications of diabetes		
No	26	17.0
Yes		
Optical	48	31.4
Blood pressure and heart disease	53	34.6
Renal	15	9.8
Diabetic foot ulcer	11	7.2
Source of information about diabetes		
Doctor	98	64.1
Educational books and booklets	22	14.3
Friends	14	9.2
Media	19	12.4

TABLE 2. Relationship between demographic information and the type of contraceptive methods (low effect vs. high effect) used by diabetic women referred to government diabetes clinics in Guilan province

Variable	High-effective contraceptive methods N (%)	Low-effective contraceptive methods N (%)	p
Number of children			0.010 [†]
No child	2 (3.0)	2 (2.9)	
1-3	60 (90.9)	50 (73.5)	
4-6	4 (6.1)	16 (23.6)	
Place of residence			0.750 [†]
Urban	56 (84.8)	59 (86.8)	
Rural	10 (15.2)	9 (13.2)	
Education			0.490 [†]
Primary	31 (47.0)	26 (38.2)	
Middle and high school	33 (50.0)	38 (55.9)	
Academic	2 (3.0)	4 (5.9)	
Spouse's education			0.730 [†]
Primary	21 (31.8)	24 (35.3)	
Middle and high school	40 (60.6)	37 (54.4)	
Academic	5 (7.6)	7 (10.3)	
Occupation			0.020 [†]
Housewife	53 (80.3)	63 (92.7)	
Healthcare employee	1 (1.5)	2 (2.9)	
Nonsanitary-medical employee	12 (18.2)	3 (4.4)	
Spouse's occupation			0.080 [†]
Worker	5 (7.6)	14 (20.6)	
Self-employment	1 (1.5)	2 (2.9)	
Healthcare employee	29 (43.9)	19 (27.9)	
Nonsanitary-medical employee	31 (47.0)	33 (48.6)	
Family income			0.590 [†]
Insufficient	30 (45.5)	34 (50.0)	
Relatively sufficient	32 (48.4)	28 (41.2)	
Sufficient	4 (6.1)	6 (8.8)	
Diabetes			0.640 [†]
Type 1	6 (9.1)	6 (8.8)	
Type 2	60 (90.9)	62 (91.2)	
Complications of diabetes			0.890 [†]
No	9 (13.6)	12 (17.6)	
Yes			
Optical	22 (33.3)	23 (33.8)	
Blood pressure and heart disease	24 (36.4)	20 (29.4)	
Renal	6 (9.1)	8 (11.8)	
Diabetic foot ulcer	5 (7.6)	5 (7.4)	
Source of information about diabetes			0.520 [†]
Doctor	44 (66.7)	40 (58.8)	
Educational books and booklets	7 (10.6)	11 (16.2)	
Friends	8 (12.1)	6 (8.8)	
Media	7 (10.6)	11 (16.2)	
Age (Mean ± SD)	44.49 ± 5.43	43.59 ± 5.38	0.450 [§]

† Chi-square test; ‡ Fisher's exact test; § Independent T-test

TABLE 3. Contraceptive methods used by diabetic women referred to government diabetes clinics in Guilan province

Variable	N	%
Contraceptive		
High efficacy		
Tubal ligation	36	23.5
Oral contraceptive pills	22	14.4
Intrauterine device	5	3.3
Vasectomy	3	2.0
Low efficacy		
Withdrawal	58	37.9
Condom	10	6.5
No contraceptive method	19	12.4

Table 3. continued

Variable	N	%
The purpose of using contraception		
Limit the number of children	99	73.9
Distance between children	35	26.1
Counseling and decision-making about contraception		
Together with her husband	84	62.7
Gynecologist	22	16.4
Midwife	17	12.7
Endocrinologist	11	8.2
A history of contraceptive failure		
Yes	21	13.8
No	132	86.2

TABLE 4. Relationship between demographic information on the use of OCP and no OCP contraceptives among diabetic women referred to government diabetes clinics in Guilan province

Variable	OCP	No OCP	<i>p</i>
Age			
<30	0 (0.0)	4 (3.6)	0.660 [†]
31 – 35	5 (22.7)	24 (21.4)	
>36	17 (77.3)	84 (75.0)	
Education			
Primary	12 (54.6)	45 (40.2)	0.440 [†]
Middle and high school	9 (40.9)	62 (55.4)	
Academic	1 (4.5)	5 (4.4)	
Spouse's education			
Primary	8 (36.4)	37 (33.0)	0.720 [†]
Middle and high school	13 (59.1)	64 (57.1)	
Academic	1 (4.5)	11 (9.9)	
Occupation			
Housewife	21 (95.5)	95 (84.8)	0.140 [‡]
Healthcare employee	1 (4.5)	2 (1.8)	
Nonsanitary-medical employee	0 (0.0)	15 (13.4)	
Spouse's occupation			
Worker	2 (9.1)	17 (15.2)	0.680 [‡]
Self-employment	1 (4.5)	2 (1.8)	
Healthcare employee	7 (31.9)	41 (36.6)	
Nonsanitary-medical employee	12 (54.5)	52 (46.4)	
Family income			
Insufficient	9 (40.9)	55 (49.1)	0.440 [†]
Relatively sufficient	10 (45.5)	50 (44.6)	
Sufficient	3 (13.6)	7 (6.3)	
Place of residence			
Urban	19 (86.4)	96 (85.7)	0.620 [†]
Rural	3 (13.6)	16 (14.3)	
Blood pressure and heart disease			
Yes	6 (27.3)	33 (29.5)	0.530 [†]
No	16 (72.7)	79 (70.5)	
Counseling and decision-making about contraception			
Together with her husband	14 (63.6)	70 (62.5)	0.540 [†]
Specialist physician	4 (18.2)	29 (25.9)	
Midwife	4 (18.2)	13 (11.6)	

† Chi-square test; ‡ Fisher's exact test

DISCUSSION

The findings of the present study reveal the prevalent use of contraceptive methods in the majority of diabetic

women. By contrast, 12.4% were inhibited from using contraceptive methods for reasons such as the opposition of their husbands (47.4%), the desire to get pregnant (36.8%), and fear of side effects (15.8%). Diabetic women

have less likelihood of using contraceptive methods due to various reasons, including the fear of weight gain caused by hormonal contraceptive methods, the exacerbation of their condition as a result of subsequent obesity and weight gain, risks of cardiovascular diseases such as arterial and venous thrombosis, and increased risk of infection caused by IUD and subcutaneous implants.^{15,19-22} Britton *et al.* reported that in women with diabetes, given their fear of side effects and lack of support from their spouse, the decision for family planning is not necessarily associated with the use of contraceptive methods.²³

In the present study, 44.4% and 43.2% of diabetic women used low-effect (interruption and condoms) and used high-effect (TL, OCP, IUD, and vasectomy) contraception, respectively. A significant relationship was observed between the number of children and the type of contraception (high or low effect). Those who used low-efficacy contraceptive methods had more children. In addition, the low-effect withdrawal method was mainly used by subjects who had a history of contraceptive method failure. In the study of Horsan *et al.*, which is in line with the present research and was conducted to investigate the quality of sexual life among Iranian diabetic women, the withdrawal method and use of condoms are the main contraception methods.¹ According to Khan *et al.*, women with diabetes mainly used withdrawal and periodic abstinence for contraception.¹³ Another work showed that more than half of diabetic women used low-efficacy contraceptive methods; they assumed that their currently preferred method was appropriate and believed that the risks of an unwanted pregnancy were far less than those of using methods such as OCP, IUD, and implants.¹² In the work of Harris *et al.*, although most young women with chronic diseases used contraceptive methods, most of the approaches they considered had a low efficacy in the prevention of pregnancy.¹⁷ In our study, considering the relatively high percentage of diabetic women using less effective contraceptive methods and the use of withdrawal methods by those with a history of contraceptive failure, the importance of counseling and care services for diabetic women should be given more attention. Inadequate information and fear of side effects cause diabetic women to inhibit from using prevention methods or use less effective ones, such as withdrawal methods and periodic abstinence.^{6,12,13,17} On the other hand, most of the diabetic women included in our study mentioned that they were using contraception to limit the number of children they were having. Given this consideration, a number of diabetic women may become pregnant under unplanned and suboptimal conditions.

Various factors influence the use of contraceptive methods: age, education, employment status, economic status, expected number of children, place of residence (urban/rural), knowledge, and attitude.^{24,25} The use of

appropriate contraceptive methods may be reduced in diabetic women residing in rural areas due to poverty and low levels of wealth, limited access to health services, and low levels of education.²⁴ Low literacy also hinders self-care education among diabetic patients.²⁶ In the present study, among the demographic factors investigated, a significant relationship was observed between the number of children and the type of contraceptive method used (low effect versus high effect), with more children reported by diabetic women who used low effect contraceptive methods. Devita *et al.* discovered a significant relationship between the number of children and modern contraceptive methods.²⁷ Thus, women who had three or more children used modern contraceptive methods more compared with those who had no children.²⁷ In our study, a significant relationship was noticed between occupation and the type of contraceptive method (low effect versus high effect), with more housewives using low-effect contraceptive methods. Although no significant relationship was observed between other demographic factors and the type of contraceptive method (low effect versus high effect) in the present study, based on some research, an essential relationship exists between demographic factors, such as women's education, men's education, place of residence (urban/rural), and economic status, and contraceptive methods. As a result, an increase in a couple's level of education and an improvement in a family's socioeconomic well-being have been associated with the increased use of contraceptive methods, especially highly effective ones.^{24,25} Devita *et al.* observed a significant relationship between age and modern contraceptive methods.²⁷ Notably, younger women used more modern contraceptive methods.²⁷ Britton *et al.* revealed a significant relationship between education level and high-effect contraceptive methods.⁶

In the present study, blood pressure complications and cardiovascular disease were detected in 27.3% of people who used OCP contraceptives. However, no significant relationship was found between blood pressure complications and heart disease and the use of OCP and non-OCP contraceptives. The use of OCP was selected mainly by couples without consulting a doctor. Although contraceptive recommendations for women with and without diabetes show no difference from various respects, concerns have been raised regarding the relationship between hormonal contraception, glycemic control, and vascular disease.^{11,15} Based on a cohort study that was conducted to determine contraceptive methods before and after the diagnosis of diabetes, the use of contraceptive methods containing estrogen decreased in the first year after the diagnosis of the disease.¹⁵ Thus, the fear of side effects is an essential factor that prevents diabetic women from using hormonal contraceptive methods.^{15,19} Meanwhile, contraceptive methods containing estrogen for women with uncomplicated diabetes are mostly safe and secure.^{11,15} Diabetic women and healthcare providers face challenges related to the

prescription and the use of effective contraception. On the one hand, diabetic women assume that they have limited options regarding effective and safe contraceptives, given their underlying condition. On the other hand, clinicians face challenges with regard to the prioritization of disease management, appropriate prevention methods, and optimal and suitable timing for pregnancy.¹⁵

Most of the subjects were obese (BMI \geq 30) and suffering from type 2 diabetes and related complications. Studies have shown that the increased prevalence of obesity is a global concern and a significant risk factor for type 2 diabetes. Diabetes has been associated with microvascular complications, such as retinopathy, nephropathy, and neuropathy, and macrovascular complications, such as cardiovascular problems, which affect women of reproductive age.^{3,11}

In the present study, physicians were the source of information about diabetes for more than half of the studied population, and the role of media accounted for 12.4%. Hendrieckx *et al.* also reported physicians as the main source of information for women with type 2 diabetes.²⁸ However, in our study, the decision to use contraceptives was mainly the couple's responsibility, followed by consultation with a specialist. A qualitative study revealed that diabetic women barely received contraceptive advice in their routine care; regardless, advice from healthcare professionals strongly influenced their contraceptive decisions.¹⁹ According to Hibbert *et al.*, despite the awareness of the risks of diabetes in pregnancy, less than half of the women they studied sought counseling and preconception care; in addition, despite mainly obtaining information on contraceptive methods from general practitioners (69.9%), most of them had little knowledge regarding effective and reliable contraceptive methods.¹⁸ Given the uniqueness of selecting the proper contraceptive method for each person, especially women with chronic diseases, comprehensive assessment and proper planning must be carried out to ease access to safe and effective contraceptive methods for women with chronic diseases.²⁹ In Iran, given the decrease in population growth rate,³⁰ policymakers have started paying attention to population increase policies. The Family and Youth Protection Law in Iran (approved in 2021) prohibits the free distribution of any items related to pregnancy prevention, the insertion of prevention items, and the encouragement of their use in healthcare networks affiliated with medical sciences universities. A doctor must prescribe the provision of contraceptives in pharmacies across the country and health networks and the insertion of contraceptive items.³¹

This study encountered the following limitations. Our cross-sectional analysis did not imply that diabetes motivates contraceptive use. Instead, we described patterns of contraceptive use among women with

diabetes. Given the socioeconomic characteristics of the research population in the current study, which comprised diabetic women referred to government diabetes clinics in Guilan, the generalization of the obtained results had its limitations. In Iran, individuals who visit government centers usually belong to lower socioeconomic deciles compared with those who make appointments in private centers. Meanwhile, the inhibition from the use of safe and effective contraceptive methods can be attributed to the lack of knowledge, financial problems, and difficulty of accessing contraceptive methods from government sources.¹³ Thus, future studies should consider such issues. Another limitation was the lack of accurate and honest answers from diabetic women who responded to the questionnaire. Meanwhile, a strength of the current study was the highlighting of existing gaps, including the use of less effective contraceptive methods and limited use of counseling services by diabetic women. Therefore, considering the current policies on population increase in Iran, healthcare professionals can support women with diabetes to achieve their pregnancy goals by providing preconception care and family planning.

CONCLUSIONS

The findings of the present study show that a relatively high percentage of diabetic women use less effective contraceptive methods, and the decision to use contraceptive methods is made mainly by couples. A significant relationship was observed between the number of children, occupation, and the type of contraception (high or low effect). Therefore, targeted reproductive health interventions and providing counseling services as part of medical care for diabetic women seem necessary.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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