

## Social determinants of anesthesia choice for cesarean section in mothers attending selected primary health care centers of Tehran

Ali-Asghar Kolahi<sup>1\*</sup>, Mehran Lak<sup>2</sup>, Narges Malih<sup>1</sup>

<sup>1</sup> Social Determinants of Health Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup> Department of Infectious Diseases, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

**Corresponding author and reprints:** Ali-Asghar Kolahi. Social Determinants of Health Research Center, Koodakyar Ave., Daneshju Blvd., Velenjak, Tehran, Iran

**Email:** a.kolahi@sbm.ac.ir

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### Abstract

**Background:** There are different techniques for anesthesia in Cesarean Section (C/S), which can be affected by different factors including mothers and health care providers' preferences. The objective of the present study was to evaluate social determinants of anesthesia choice for Cesarean Section in mothers attending selected primary health care centers of Tehran.

**Methods:** The current descriptive cross-sectional study was conducted in mothers who had a history of C/S and settled in catchment area of selected Primary Health Care centers known as Defined Population (DP). The DP is linked to Social Determinants of Health Research center affiliated to Shahid Beheshti University of Medical Sciences, Tehran.

**Results:** Totally, 1408 mothers participated in the study. The mean±SD age of mothers was 27.6±4.42, more than 50% of the participants had university education, and about 25% of mothers were unemployed. The previous history of C/S was reported by 29.9% of mothers and 91.9% of these mothers had experienced general anesthesia. Anesthesia choice of the study participants was as follows: 562 (39.9%) general anesthesia, 566 (40.2%) local anesthesia, 231 (16.4) had no idea about the anesthesia method, and 46 (3.5%) did not want to have C/S. The most frequent person with whom mothers discussed the method of anesthesia prior to their admission was their gynecologist (44%). The final decisions for choosing anesthesia method were made by the patient in about 40% of the participants.

**Conclusion:** Informing mothers appropriately about anesthesia procedure and possible complications of each technique in the prenatal period can help mothers for choosing the best method of anesthesia and may increase mothers' tendency to have local anesthesia.

**Keywords:** Cesarean Section; Primary Health Care; Social Determinants of Health

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### Introduction

During the recent years, there has been an increase in Cesarean Section (C/S) rate worldwide (1). Although a 10% rate of C/S is justified when mothers' and neonates' benefits are considered (2), a 40% prevalence of C/S has been reported in Iran (4,5), which was up to 84% in Tehran hospitals (6,7).

There are several techniques for anesthesia during C/Ss. These techniques are divided into two main categories: local and general anesthesia (8). Although local anesthesia is generally preferred for C/S, there is no evidence to claim for its preference to general anesthesia (9,10), but some studies indicated that local anesthesia is to be preferred for compromised fetus (11).

Different factors affect choice of anesthesia for C/S. Choosing anesthesia method might be according to mother's preference and with respect to the availability of medical equipment, and also benefits and harms of each method (12). Along with the aforementioned reasons, the time and the quality of communicating between the anesthesiologist and the patient prior to and during the surgery affects mother's anesthesia choice (13). Anesthesiologists should discuss about appropriate types of anesthesia for C/S; the way the procedure is conducted; and the advantages and disadvantages of each type of anesthesia to enable the patients to choose their preferred anesthesia method (9).

The objective of the present study was to evaluate social determinants of anesthesia choice for C/S and patient satisfaction with anesthesia services in mothers attending selected primary health care centers of Tehran.

## Methods

The study was approved by Ethical Committee of Shahid Beheshti University of Medical Sciences, Tehran. In the present study, participants were assured that their identity and responses would be kept confidential. The interview was held in a private room by female general practitioners. All participants provided an informed consent prior to taking part in the study. Also, participation was totally voluntary and all the participants were assured that they could leave the study at any stage. In addition, we made sure that we did not take much of participants' time and that they did not miss their turn while waiting in the clinic.

### Setting

The present descriptive cross-sectional study was conducted on mothers who had a history of C/S and settled in the catchment area of selected Primary Health Care centers known as Defined Population (DP). The DP is linked to Social Determinants of Health (SDH) Research network of Tehran; SDH is supported by Deputy in Health

Affairs at Shahid Beheshti University of Medical Sciences, Tehran. Certain areas of 11 health centers, which include about 11000 persons within 800 families, are dedicated to DP. This population is selected from all five different socio-economic statuses of Tehran and it seems to be representative of the population in Tehran.

### Participants

All mothers who referred for neonatal screening in the selected health care centers and who had a history of C/S in different hospitals in Tehran within the two months prior to referral were recruited in the study.

### Variables and data collection

Data was collected using a designed questionnaire, including demographics by midwives working in the healthcare centers and delivered to the Social Determinants of Health research center. To get proper and complete answers, researchers followed a structured approach. The study questionnaire consisted of socio-demographic data, including age, level of education, and occupation of mothers, date of C/S, and sex of the newborn. Determinants of anesthesia choice for C/S in the participants was evaluated by asking the following questions: 1. Have you ever been under anesthesia? 2. Have you thought about the method of anesthesia? 3. Who did you discussed with regarding anesthesia method prior to admission? 4. Under which type of anesthesia have you been? 5. Did they ask your opinion about anesthesia before C/S? 6. Who made the final choice about the anesthesia method?

Sample size was calculated to be 1068, taking into account the prevalence of choosing local anesthesia method of 50%, confidence interval=95%, and accuracy=3%.

### Data analysis

Data was analyzed using SPSS software, version 16 (SPSS Inc., Chicago, IL, USA). Descriptive statistics was used for data analysis. The level of significance was set at  $P < 0.05$ . The study was approved by Shahid Beheshti University of Medical

Sciences, Tehran (Project: 311.93.11.26, Ethics code: IR.SBMU.REC.1393.757).

### Results

Totally, 1408 mothers participated in the study. The mean±SD age of mothers was 27.6±4.42 and 49.9% of the neonates were female. Also, about 12% of the mothers participating in the present study did not have any insurance; the rest had insurance belonging to Health (10.6%), social security (63.5%), Armed Forces (8.3%), and other medical insurance (6.7%) providers. Other socio-demographic characteristics of the participants are illustrated in Table 1.

A previous history of C/S was reported by 29.9% of mothers, among whom 91.9% had a history of general anesthesia. The mean (SD) number of undergoing previous anesthesia in the participants was 0.4 (0.78) with a range of 0 to 6.

Anesthesia choice of the study participants was as follows: 562 (39.9%) general anesthesia, 566 (40.2%) local anesthesia, 231 (16.4) had no idea, and 46 (3.5%) did not want to have C/S. The most frequent person with whom mothers discussed the method of anesthesia prior to their admission was their gynecologist (44%). Also, a total of 721 (51.3%) mothers had been asked about their preference regarding anesthesia method prior to C/S. The final decision for choosing anesthesia method was made by the patient in 580 (41.4%) of the cases. For 509 (36.3%) and 230 (16.4%) of the patients the anesthesiologist and gynecologist, respectively, made the final decision regarding the anesthesia choice; the remaining 82 (5.9%) did not have any idea who made the decision (Table 2).

Table 1. Socio-demographic characteristics of the participants and the preferred type of anesthesia

Variables		N (%)
First child's sex	Female	702 (49.9)
	Male	705 (50.1)
Mother's education	No literacy	2 (0.1)
	Primary school	21 (1.5)
	Middle school	84 (6)
	High school and diploma	564 (40.1)
	University	736 (52.4)
Mother's occupation	Employed	304 (24.8)
	Unemployed	923 (75.2)
Father's education	No literacy	4 (0.2)
	Primary school	29 (2.1)
	Middle school	156 (11.1)
	High school and diploma	609 (43.4)
	University	607 (43.2)
Father's occupation	Unemployed	4 (0.3)
	Governmental employee	585 (41.8)
	Non-governmental employee	712 (50.9)
	Professional other	89 (6.4) 9 (0.6)
Having insurance	Yes	1241 (88.1)
	No	167 (11.9)

Table 2. Determinants of anesthesia choice for C/S in the participants

Questions	Options	N (%)
Have you ever been under anesthesia?	Yes	421 (29.9)
	No	987 (40.1)
Under which type of anesthesia have you been?	General	373 (91.9)
	Local	33 (8.1)
Have you thought about the method of anesthesia?	Yes	908 (64.5)
	No	500 (35.5)
Who did you discuss with regarding anesthesia method prior to admission?	Gynecologist	391 (44)
	Family and Acquaintances	201 (22.6)
	No one	126 (14.2)
	Friends and co-workers	67 (7.5)
	Other patients	43 (4.8)
	Husband	29 (3.3)
	Health workers	13 (1.5)
	Internet	12 (1.3)
	Anesthesiologist	6 (0.7)
Other specialist	1 (0.1)	
Did they ask your opinion about anesthesia before C/S?	Yes	721 (51.3)
	No	684 (48.7)
Who made the final choice about the anesthesia method?	Myself	580 (41.4)
	Anesthesiologist	509 (36.3)
	Gynecologist	230 (16.4)
	Do not know	82 (5.9)
How much were you satisfied with anesthesia method?	Highly satisfied	910 (65.1)
	Somewhat or low	488 (34.9)
Which anesthesia method do you prefer in your possible future pregnancies?	General	633 (45.2)
	Local	664 (47.5)
	Don't know	102 (7.3)

Moreover, of all the participants, 951 (68%) underwent local anesthesia. Overall, a high level of satisfaction was expressed by patients, with 78.2% of the patients who had general anesthesia, and 59% of the patients who had local anesthesia responding that they were highly satisfied with the anesthesia method ( $P<0.001$ ).

### Discussion

Gynecologist was the most frequently discussed person for choosing anesthesia method before admission. This finding is in line with that reported in Kee et al. in which anesthetists and obstetricians were the most important influencers who had significantly higher percentage as source of information for patients to choose local anesthesia compared with general anesthesia ( $P=0.01$ ) (14).

Mothers who underwent local anesthesia were significantly less satisfied from the

method of anesthesia. In contrast to our findings, patients who underwent local anesthesia in Australia were significantly more satisfied in comparison with the patients who underwent general anesthesia (21% vs. 12.7%,  $P=0.03$ ) (14). In a similar study in Turkey, only 6.3% of the patients with local anesthesia stated that they were not satisfied with regional blocks (15). The differences could be due to the difference in the structure of the questionnaires used.

Along with a previous study, despite the high level of satisfaction, only about half of the participants were asked about their opinion regarding the method of anesthesia (14). Since it is shown that choices of anesthesia can be changed by adequate information about different methods of anesthesia (15–17), health care providers should inform the patients about the advantages and disadvantages of each method and give patients the opportunity

to ask their questions.

Although in the current study, about 35% of mothers had not thought of any method of anesthesia, 10% of Turkish mothers had no idea of which anesthesia type to choose (15).

About 48% of mothers in our study declared they would choose local anesthesia for their future delivery. Along with our finding, 30% of mothers who participated in a similar study in Iran preferred local anesthesia, too (18). Furthermore, about 30% of Nigerian and 33% of Pakistani mothers preferred local anesthesia for C/S (8,19). Other studies had shown higher rates of choosing local anesthesia, as well, as in a study by Fassoulaki et al. where in about 80% of the study participants declared they would choose local anesthesia for the future C/S (20). Also, Down et al. reported that about 96% of respondents would choose local anesthesia for possible future C/S (21).

We observed that more than 90% of mothers had undergone general anesthesia in their previous C/S. In contrast to our finding, in a study carried out in England, only about 5% of mothers had a history of general anesthesia in their previous C/S (21). Although the choice of technique for anesthesia is controversial, choosing local anesthesia can benefit mothers considering the state of consciousness during and after delivery, which subsequently leads to earlier breast feeding initiation (22).

The main strength of the current study was the population-based sampling which may prevent bias due to unpredictable variables. We interviewed the women who attended Primary Health Care Centers for neonatal screening within the week after birth; this may have decreased the effect of recall bias in our findings. Similarly, our study had some limitations, as well, which should be taken into account. We could not find a causal relationship considering the cross-sectional design of the study. Also, mothers who were seriously ill and thus could not attend health care centers were not concluded in the study.

We have identified the factors that mothers found important in making their choice about anesthesia for C/S. Appropriately informing mothers about anesthesia procedure and possible complications of each technique in the prenatal period and encouraging them to benefit from consciousness and early skin to skin contact in local anesthesia may increase the level of satisfaction and preference of local anesthesia.

#### *Conflict of interest*

Authors declare no conflict of interests.

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