THE PREVALENCE OF CESAREAN AND THE EFFECTING FACTORS DURING THE COVID-19 PANDEMIC

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Abstract

In terms of the clinical picture during pregnancy and perinatal outcomes, there is an insufficient amount of data in the literature regarding the effects of COVID-19 infection, which is spreading rapidly worldwide. In this study, we aimed to determine the frequency of cesarean deliveries in during the pandemic, as well as to show the effect of COVID-19 positivity and certain other variables on cesarean section delivery. The sample of this cross-sectional study consists of 956 women who gave birth in a state hospital. In this study, the prevalence of cesarean section was found to be 33.2%. Also, compared to the general population the rate of cesarean delivery was found to be 2.1 times higher in women whose incomes were less than their expenses, 2.2 times higher in those with health insurance, 13.6 times higher in those who were COVID-19 positive, and 1.6 times higher in those who did not receive regular prenatal care. This study showed that COVID-19 infection and negativities related to the social determinants of well-being significantly increased the prevalence of cesarean section during the pandemic period. Governments should take more serious steps toward reducing healthcare inequalities, especially in terms of maternal and infant health.

Keywords: Cesarean Section, COVID-19, Prevalence, Turkey.

COVID-19 PANDEMİSİ SIRASINDA SEZARYEN PREVALANSI VE ETKİLEYEN FAKTÖRLER

Öz

Tüm dünyada hızla yayılan COVID-19 enfeksiyonun gebelikte klinik tablo ve perinatal sonuçlarına ilişkin literatürde yetersiz miktarda veri bulunmaktadır. Bu çalışmada pandemi döneminde sezaryen doğum sıklığını belirlemeyi, aynı zamanda COVID-19 pozitifliği ve diğer bazı değişkenlerin sezaryen doğumlar üzerindeki etkisini göstermeyi amaçladık. Kesitsel tipteki çalışmanın örneklemini bir devlet hastanesinde doğum yapan 956 kadın oluşturdu. Çalışmada, sezaryen prevalansı %33.2 olarak belirlendi. Sezaryenle doğum yapma, geliri giderinden az olan kadınlarda 2.1 kat, sağlık güvencesi olanlarda 2.2 kat, COVID-19 pozitif olanlarda 13.6 kat ve düzenli DÖB almayanlarda 1.6 kat daha fazlaydı. Çalışma sonuçları, pandemi döneminde COVID-19 enfeksiyonu ve sağlığın sosyal belirleyicilerine ilişkin olumsuzlukların sezaryen prevalansını önemli ölçüde artırdığını göstermiştir. Hükümetler, özellikle anne ve bebek sağlığı açısından sağlık hizmetlerindeki eşitsizliklerin azaltılmasına yönelik daha ciddi adımlar atmalıdır.

Anahtar Kelimeler: Sezaryen, COVID-19, Prevalans, Türkiye.

1. INTRODUCTION

A pneumonia outbreak of unknown etiology was detected on December 31st, 2019 in the Wuhan province of China. On January 7, 2020, it was announced that the pathogen causing this epidemic was the virus called the novel coronavirus (2019-nCoV) (1). The disease spread rapidly, first to other provinces of China, and from there to the whole world (2). Coronavirus disease (COVID-19) was reported by the World Health Organization (WHO) as an urgent public health problem on 30th February 2020, and was declared as a pandemic on March 11, 2020 (3).

According to the data of WHO-dated February 01, 2021-102,399,513 people became infected and 2,217,005 people died globally in this epidemic. In Turkey, 2,470,901 people became infected and 25,865 died due to coronavirus (4).

In their statement on the risk groups during the pandemic, the WHO and UNFPA (United Nations Population Fund) reported that women who were pregnant or women who had given birth were not in the high-risk group for COVID-19 infection. In the same statement, it was reported that the COVID-19 infection had no effect on the delivery method, and the delivery method should be determined according to obstetric indications and preferences of the woman. However, in the same technical brief, it is also emphasized that the risk of complications increases due to physiological changes, such as immunity and increase in oxygen demand, among others, during pregnancy and postpartum period. Accordingly, it is necessary to show cautiousness in maternal aspects during gestation and parturition and the postpartum period (5,6).

Data on the clinical picture and perinatal consequences of COVID-19 during pregnancy are limited. The evidence that this infection increases serious maternal or neonatal outcomes is currently insufficient. However, there is an increasing number of studies explaining that complications such as premature membrane rupture, fetal distress, and preterm labor develop more frequently in these cases (7,8) and that most of the cases undergo a cesarean delivery (9-11). In this regard, further cross-sectional studies in regions with high COVID-19 incidence are warranted to acquire better results in a shorter time.

For this reason, this cross-sectional study was conducted to determine the frequency of cesarean delivery in during the pandemic, as well as to show the effect of COVID-19 positivity and certain other variables on cesarean section delivery.

2. MATERIALS AND METHODS

2.1. Study Design and Ethical Issues

This cross-sectional study was conducted in Sanliurfa, a province located in Southeast Anatolia Region in Turkey. In a study conducted by the State Planning Organization, Şanliurfa is ranked 73rd out of 81 cities in terms of its socio-economic development (12). Sanliurfa also is the province with the highest fertility rate in Turkey. According to the 2019 data of the Turkish Statistical Institute, Turkey had a total fertility rate of 1.88, whereas the rate recorded in Sanliurfa region was 3.89 (13).

The research was conducted in a state hospital in the province where approximately 40% of births occur. In this hospital, approximately 60 to 80 births occur in a day. According to the records of the hospital where the study was conducted, 23,891 births took place between January 01, 2020 and December 31, 2020.

To conduct the study, written permission (dated 21.12.2020 and numbered E-76244175-050.04.04-1078) was obtained from the Ministry of Health, the hospital where the study was

conducted, and the ethics committee of the university. Informed consents were obtained from the women participating in the study.

2.1. Sampling

The study population included women who gave birth in a state hospital in the center of Sanliurfa province. In 95.0% confidence interval, the estimated cesarean prevalence was taken as 33.8% (calculated according to hospital records), and the sample size required for the study was calculated as 956 with a 3.0% margin of error.

2.2. Procedures

Data were collected through face-to-face interviews at postpartum and pandemic clinics between December 22, 2020 and January 11, 2021.

No one refused to participate in the study. In order for the women to be able to answer the questions comfortably, a suitable environment was provided.

2.3. Instrumentation

Consist of questions about the socio-demographic characteristics and fertility characteristics Personal Information Form was used as a data collection tool.

2.4. Defination

In the research, the variable "spoken language in family" was used to describe different cultures. The research population includes people from different cultures who speak Kurdish, Turkish and Arabic. While these people speak their native language in their families, they can also speak Turkish, which is the official language.

2.5. Data Analysis

Data were analyzed using descriptive statistics (percentage, median, minimum, and maximum), Chi-square test and Mann–Whitney U test from univariate analysis, and logistic regression from multivariate analysis. Analyses were performed with SPSS 20.0 package program.

The dependent variable of the research was that the parturition will be through cesarean section.

The independent variables of the research were as follows: sociodemographic characteristics of women, fertility characteristics, and presence of COVID 19.

In univariate analysis, the logistic regression model (enter model) was created by using variables responsible for significant differences. Perceived income (income<expense/income≥expense), health insurance (present/absent), COVID-19 diagnosis (positive/negative), regular prenatal care status, number of live births (<3 children/≥3 children) were taken as independent variables in the logistic regression analysis.

Findings were interpreted at 95.0% confidence interval and $p<0.05$ was considered significant.

3. RESULTS

Table 1. Distribution of some socio-demographic characteristics of women by type of delivery.

Features	Delivery Type						
	Normal Vaginal		Cesarean				
	Median* (min-max)		Median* (min-max)		Median** (min-max)	M-W-U	p
Age (years)	26 (18–45)		28 (17–55)		27 (17–55)	96941.5	0.280
	Number	%*	Number	%*	%**	X^2	p
Education status							
Illiterate	326	65.6	171	34.4	52.0	3.07	0.54
Literate	169	65.3	90	34.7	27.1		
Primary education	83	71.6	33	28.4	12.1		
Secondary education	40	72.7	15	27.3	5.8		
University and above	21	72.4	8	27.6	3.0		
Employment status							
Employed	54	77.1	16	22.9	7.3	3.13	0.07
Unemployed	585	66.0	301	34.0	92.7		
Location							
City center	142	68.9	64	31.1	21.5	2.45	0.29
District	328	68.0	154	32.0	50.4		
Town / Village	169	63.1	99	36.9	28.1		
Spoken language in family							
Turkish	65	70.8	35	29.2	12.6	1.23	0.53
Kurdish	289	67.1	142	32.9	45.1		
Arabic	265	65.4	140	34.6	42.3		
Income status							
Income less than expenses ***	503	64.7	275	35.3	81.3	**10.88**	**0.004**
Income equal to expenses	123	75.0	41	25.0	17.2		
Income more than expenses	13	92.9	1	7.1	1.5		
Health insurance							
Available	476	64.3	264	35.7	77.4	**8.86**	**0.002**
Not available	163	75.5	53	24.5	22.6		
Chronic illness							
Available	34	75.6	11	24.4	4.7	1.23	0.26
Not available	605	66.4	306	33.6	95.3		
COVID-19							
Positive	4	18.2	18	81.8	2.3	**21.86**	**<0.001**
Negative	635	68.0	299	32.0	97.7		
Total	639	66.8	317	33.2	100.0		

* row median/row percentage, ** column median/ column percentage, *** group making differenc

The average age of the women was 27.87 ± 6.5 years, and the median was 27 (17–55) years. In total, 79.1% of the women had no formal education, 7.3% had no income-generating job, and 22.6% had no health insurance. Furthermore, 81.3% of the women evaluated their income as less than their expenses. Total 28.1% of the women lived in the countryside and 87.4% spoke mostly Arabic and Kurdish in the family. At least one chronic disease was diagnosed 4.7% of women (2.2% had hypertension, 1.5% had diabetes mellitus, 0.1% had heart disease, 0.7% had asthma bronchiale, 0.2% had renal failure, and 0.2% had epilepsy). Additionally, 2.3% of women were positive for COVID-19 (Table 1).

Table 2. Distribution of women's number of births and certain features of pregnancy by type of delivery.

Features	Delivery type						
	Normal vaginal		Cesarean				
	Median* (min-max)		Median* (min-max)		Median** (min-max)	M-W-U	p
Gestational period (weeks)	39 (32–42)		36 (26–42)		38 (26–42)	38332.0	**<0.001**
	Number	%*	Number	%*	%**	X^2	p
Pregnancy-related problems							
Occurred	26	59.1	18	40.9	4.6	0.91	0.34
Not occurred	613	67.2	299	32.8	95.4		
Receiving regular prenatal care							
Received	403	70.0	173	30.0	60.3	**6.03**	**0.01**
Not received	236	62.1	144	37.9	39.7		
Number of live births							
< 3	235	69.1	105	30.9	35.6	1.08	0.29
≥3	404	65.6	212	34.4	64.4		
Total	639	66.8	317	33.2	100.0		

* row median/ row percentage, ** column median/ column percentage

In total, 4.6% of the women reported that they experienced pregnancy-related problems, 39.7% did not receive regular prenatal care, and 64.4% gave 3 or more live births. The mean duration of gestation was 37.7 ± 2.0 weeks, the median duration was 38 (26–42) weeks (Table 2).

The total prevalence of cesarean section in the hospital was 33.2%. The prevalence of cesarean section was found to be 32.0% in COVID-19 negative women and 81.8% in COVID-19 positive women (Table 1).

Women with lower income who have health insurance and were positive for COVID-19 tended to undergo cesarean delivery levels and this difference was statistically significant (p <0.05). However, there was no statistically significant difference between the groups in terms of the women's education level, employment status, place of residence, the language they spoke the most in the family, and the variables of having chronic diseases (p> 0.05) (Table 1).

The duration of the gestational period in weeks for the women gave birth by cesarean section was lower than that for the women who gave a normal vaginal birth and this difference was statistically significant (p < 0.05). Also, the cesarean delivery levels of women who did not receive regular prenatal care were higher than the levels of those who did, and this difference was statistically significant (p <0.05). However, there was no statistically significant difference between the ages of the women who gave birth by cesarean section and women who had normal vaginal delivery (p > 0.05). Also, there was no statistically significant difference between the groups in terms of having problems related to pregnancy and the number of live births (p > 0.05) (Table 2).

Table 3. Logistic regression model of certain variables affecting cesarean delivery.

Affecting factors	B	p	Odds ratio	%95 Confidence interval
Income status (income < expenses)	0.74	**<0.001**	2.1	1.3–3.1
Health insurance (available)	0.80	**<0.001**	2.2	1.5–3.2

COVID-19 (positive)	2.61	**<0.001**	**13.6**	**4.4–41.8**
Prenatal care (not receiving)	0.52	**0.001**	**1.6**	**1.2–2.2**
Number of live births (<3)	−0.10	0.49	0.9	0.6–1.2
Constant	**−2.19**	**<0.001**		

The combined effect of independent variables on cesarean delivery was evaluated by logistic regression analysis. Logistic regression model was created with variables that make statistically significant difference in univariate analyzes. According to the logistic regression model; it was found that cesarean delivery rate was 2.1 times higher in women whose income was less than expenses, 2.2 times higher in those with health insurance, 13.6 times higher in those who were positive for COVID-19, and 1.6 times higher in those who did not receive regular prenatal care (Table 3).

4. DISCUSSION

Although cesarean delivery is a common surgical intervention worldwide, in terms of complications it may cause in the short and long term, it is a surgical procedure with a higher mortality than normal vaginal delivery. Since 1985, WHO has recommended the ideal ratio of cesarean section as 10%–15% (14). However, cesarean birth rates in many countries including Turkey are much higher than recommended rates. We found that the total prevalence of cesarean section in this study is higher than 10%–15% ratio which was recommended by WHO; however, it was lower than the ratio of cesarean section in Turkey (52%) (15).

In this study, similar to other studies (16-18), health insurance was found to be a factor that increases cesarean delivery. Probably, the presence of health insurance seems to be a factor that facilitates access to this service without requiring an extra payment.

Although it has been shown in the literature that cesarean rates are higher in women with a relatively higher income and those who receive more follow-up prenatal care (16,19); in this study, low income and not receiving regular ANC were found to be factors that increase cesarean delivery rates. It is known that social determinants of well-being such as low income, low education, unemployment, poor working conditions, housing problems, absence of health insurance, gender inequality, and a refugee status are the causes or triggers of many health problems. Furthermore, it is stated that in this pandemic period, disadvantaged groups are more affected by the negative consequences of COVID-19 (20). Adverse social factors increase the risk level during pregnancy and increase the incidence of complications (21). Regular prenatal care follow-up is important in controlling risky situations and preventing complications during pregnancy (22). Considering the characteristics of the research population such as education, health insurance, income level, and working status, it can be said that it is a highly disadvantaged group. Based on the fact that disadvantaged groups have significant problems in accessing healthcare (23), it can be said that pregnant women in this region cannot receive adequate and qualified prenatal care; therefore, complications that require cesarean section cannot be prevented.

The most striking result in our study was that the most important factor that increased cesarean delivery was the presence of COVID-19. Although studies showing the effects of COVID-19, which has affected the whole world for nearly a year, on pregnancy are limited. A meta-analysis of 24 studies stated that the most important perinatal risk is premature and cesarean delivery (11). In this study, the prevalence of cesarean section was very high (81.8%) in women who were positive for COVID-19. Women who were positive for COVID-19 were 13.6 times more likely to deliver by cesarean section. Although the cause has not been fully

elucidated, many studies have reported results pointing to the relationship between COVID-19 and cesarean section. As a matter of fact, in the study conducted by Antoun et al. (2020) in the United Kingdom, the rate of cesarean delivery for COVID-19 positive women is reported as 84%. Similarly, in a systematic review study by Banaei et al. (2020), it is stated that 99 (80.5%) of 123 pregnant women who were examined gave birth by cesarean section. In another study conducted in China, it is stated that the cesarean section rates are relatively higher in regions severely affected by the pandemic (24).

5. CONCLUSIONS

This study showed that COVID-19 infection and negativities related to the social determinants of well-being significantly increased the prevalence of cesarean section during the pandemic period. Governments should take more serious steps toward reducing healthcare inequalities, especially in terms of maternal and infant health.

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