



## Factors Associated with Preference for Repeat Cesarean in Neyshabur Pregnant Women

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### ABSTRACT

**Background:** Cesarean delivery is a surgery for deliver a baby. Women with previous cesarean delivery (CD) must often choose between a vaginal delivery (VD) and repeat CD. Our aim of this study was to investigate factors associated with preference for CD in Neyshabur pregnant women with previous CD.

**Methods:** A cross-sectional study was conducted on all pregnant women (who had previous caesarean delivery) from February 20, 2011 to March 20, 2011 in Northeast of Iran (Neyshabur). Logistic regression model was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs).

**Results:** The mean age of pregnant women was  $29.95 \pm 4.94$  years. In this study of the 292 pregnant women, 235 (80.5%) said they prefer CD. There was a statistically significant relation between preference for CD and the following variables: pregnant women's educational level ( $P < 0.001$ ; OR = 3.86; 95% CI = 1.85-8.05) and doctor's advice ( $P = 0.021$ ; OR = 3.55; 95% CI = 1.21-10.43). The pregnant women with a previous CD presented four-fold upper chance of choosing CD.

**Conclusions:** As observed in this study, most pregnant women with previous caesarean delivery prefer repeated caesarean delivery rather than VD in their subsequent pregnancy and educational level of pregnant women and doctor's advice were important factors that influenced this preference. This subject suggests the need to counsel pregnant women with an obstetrician before select delivery type.

**Keywords:** Caesarean delivery, preference, pregnant woman, vaginal delivery

### INTRODUCTION

The World Health Organization advocates a caesarean section rate of up to 15%, as evidence indicates there is no reduction in maternal and neonatal mortality and morbidity when the rate exceeds this.<sup>[1,2]</sup> During the last decade, there has been much interest in patient-demanded cesareans and the increasing caesarean delivery (CD) rates in industrialized countries.<sup>[3-5]</sup> The choice of a particular method of birth delivery by the pregnant woman (PW) is a modern, complex, and controversial subject. "Caesarean by

request” has been implicated as one of the causes for the continual increase in CD rates.<sup>[6]</sup> According to the results of Ecker study, CD by request probably occurs nearly 3% of all deliveries.<sup>[7]</sup> The increasing trend is likely to be sustained because women with previous CDs are at higher risk of repeat caesarean,<sup>[8]</sup> and there is a growing request for CD, especially in high-income countries.<sup>[9-11]</sup> Only 8.2% of United State women with a previous CD attempted a vaginal birth in 2007, compared with 35.3% in 1997, despite evidence that 60-80% of vaginal births after cesareans (VBAC) are successful.<sup>[12]</sup> A similar trend is apparent in Australia, where VBAC rates declined from 31% in 1998 to 19% in 2006.<sup>[13]</sup> Although VBAC has been extensively validated as a safe option for most women with a previous CD,<sup>[12]</sup> nonmedical factors are thought to be driving the decline in rates since medical factors have changed little over the years.<sup>[14]</sup> Recently, with attention to the emphasis on women’s participation in their medical decision, women’s request for a CD has become one of the major causes for the surgical route of delivery.<sup>[15-18]</sup> Preferences for cesarean are often associated with some factors such as previous CD, fear of birth, maternal age, maternal education, socioeconomic factors and so on.<sup>[4,19-28]</sup> The purpose of this survey was to study the preference for CD among PW with previous CD in Northeast of Iran (Neyshabur), and to identify the factors associated with the choice of CD.

## METHODS

This cross-sectional study was conducted on all PW with previous CD in Northeast of Iran (Neyshabur). The data were collected from February 20, 2011 to March 20, 2011. All participating subjects provided informed consent after being acquainted with the purpose of the study. In this study, questionnaires have been filled via face-to-face interview with PW who agreed to participate in this study and for enhance accuracy; all participants were informed that their responses would remain confidential. The questionnaires were completed for total PW with previous CD at all health centers in Neyshabur. A questionnaire was adapted and elaborated from questionnaires used in other studies<sup>[6,26,27,29-37]</sup> that focused on preference toward mode of delivery and the etiology of these preferences in PW with

previous CD. The questionnaire was pilot tested at the health center in Neyshabur, and revisions were made to ensure validity of it. Inclusion criteria to study included: (a) Women who were pregnant at any time from February 20, 2011 to March 20, 2011 (b) residence in Neyshabur, (c) having previous CD, (d) women’s agreement. Preference for CD was considered as dependent variable. The other data collected were included age, educational level, occupation, gestation age, fear of delivery in PW and age, educational level, occupation in Spouse of PW as well as local residence, safety of the baby, doctor’s advice and planned pregnancy as independent variables. The data analysis was performed using the SPSS software for windows version 16.0 (SPSS Inc, Chicago, IL). Descriptive analyses performed, including frequencies, percentages, ranges, means, and standard deviations. Chi-square test and Logistic regression model were used to investigate the relation between women’s preference for CD and other variables. We reported odds ratio with 95% confidence interval. Various variables tested to have an association with preference for CD with  $P < 0.05$ .

## RESULTS

During the study period, 1780 women were pregnant. Of them, 1488 women were excluded from the study; 76 because of disagreement to contribute in study and 1412 because of they don’t have previous CD. Finally, 292 PW remained for analysis; including 171 (58.6%) lived in urban areas and 121 (41.4%) lived in rural areas [Table 1]. The mean age of pregnant women was  $29.95 \pm 4.94$  years (range: 16-42 years) and that of their spouses was  $33.47 \pm 5.69$  years (range: 21-67 years). In total, 235 (80.5%) of the PW said that they preferred to have CD, whereas the other 57 (19.5%) wished to try for a vaginal delivery (VD). As was observed, the PW with a previous CD presented four-fold upper chance of choosing CD. After used of univariate logistic regression model we observed statistically significant relation between PW’s preference for CD and the following variables: PW’s educational level ( $P < 0.001$ ), spouse educational level ( $P = 0.039$ ), local residence ( $P = 0.012$ ) and doctor’s advice ( $P = 0.021$ ), but the relation between PW’s preference and the following variables was not statistically significant

**Table 1:** OR estimates of PW's preference for CD based on the Chi-square test

Variables	Type of preference delivery			OR (95% CI)
	Cesarean (n=235)	Vaginal (n=57)	Total (n=292)	
PW variables				
Age (years)				
≤35	202	47	249	Reference
>35	33	10	43	0.77 (0.34, 1.67)
Educational level				
<Diploma	131	47	178	Reference
≥Diploma	104	10	114	3.73 (1.8, 7.74)
Occupation				
Housewife	219	53	272	Reference
Employee	16	4	20	0.97 (0.31, 3.02)
Fear of VD/CD				
No	200	51	251	Reference
Yes	35	6	41	1.49 (0.59, 3.73)
Gestation age (week)				
<37	214	54	268	Reference
≥37	21	3	24	1.77 (0.51, 6.14)
Spouse of PW variables				
Age (years)				
≤35	156	43	199	Reference
>35	79	14	93	1.56 (0.8, 3.01)
Educational level				
<Diploma	134	41	175	Reference
≥Diploma	101	16	117	1.93 (1.03, 3.64)
Occupation				
Self-employed	204	51	255	Reference
Employee	31	6	37	1.29 (0.51, 3.26)
Other variables				
Local residence				
Rural	89	32	121	Reference
Urban	146	25	171	2.1 (1.17, 3.77)
Safety of the baby				
No	231	54	241	Reference
Yes	4	3	51	0.31 (0.068, 1.43)
Doctor's advice				
No	188	53	241	Reference
Yes	47	4	51	3.31 (1.14, 9.61)
Planned pregnancy*				
Planned	171	41	212	Reference
Unplanned	57	12	69	1.14 (0.56, 2.32)

\*Data were missing for some subjects. OR=Odds ratio, PW=Pregnant woman, CD=Cesarean delivery, VD=Vaginal delivery, CI= Confidence interval

according to univariate logistic regression model: Age ( $P = 0.503$ ), occupation ( $P = 0.955$ ), fear of delivery ( $P = 0.395$ ), gestation age ( $P = 0.365$ ) in PW, age ( $P = 0.188$ ), occupation ( $P = 0.587$ ) in spouse of PW, safety of the baby ( $P = 0.115$ ) and

planned pregnancy ( $P = 0.719$ ) [Table 1]. At the end, we evaluated the relation between different variables and PW's preference using multivariate logistic regression model with forward method. Variables with significant relations were as follows:

PW's educational level ( $P < 0.001$ ) and doctor's advice ( $P = 0.021$ ) [Table 2].

## DISCUSSION

Pregnant woman must often select between a VD after prior cesarean and elective repeat CD.<sup>[38]</sup> According to the results of this study, 80.5% of PW with previous CD said that they preferred to have CD at the end of the pregnancy period, while 19.5% of them preferred to have VD. In Karlstrom study observed that 79.5% of women with previous CDs preferred CD.<sup>[24]</sup> In Faisal and pang studies observed a significant relation between women's preference for CD and previous CD.<sup>[6,26]</sup> A study in Taiwan showed that the rate of VDs after CDs were from 3.9% to 4.5%.<sup>[39]</sup> The rate of VD after a CD in the United State was 31% in 1998 and 12.7% in 2002.<sup>[40,41]</sup> In a systematic review that was done in order to review the published literature on women's preferences for CD, observed that women with previous CDs reported more preference for CD (29.4%) in comparison to women without a previous CD (10.1%).<sup>[42]</sup> As was observed, these outcomes were strongly associated with the previous type of delivery and women with previous CD presented a much lower chance of choosing VD. Concerns over uterine rupture and its attendant morbidity are associated with a decline in the trial of vaginal birth after CD.<sup>[43,44]</sup> Before considering the other results, one of the limitations of the present study must be highlighted. This was a cross-sectional study which limits considerations regarding causality, because in cross-sectional study the choice was only assessed at the point of time. However one of the major advantages of this study was that we use of logistic regression model to control effect of confounding variables in the presence of other variables. In this study, after using of multivariate logistic regression model, we observed a strong positive relation between the PW's preference for CD and educational level of

them. As observed in Table 1, 91.23% of women with diploma and upper prefer CD, but only 73.6% of women with educational level less than diploma prefer CD. Studies from the United States by Dunsmoor-Su and king showed that a higher level of maternal education was an independent factor associated with upper cesarean births after caesareans.<sup>[45,46]</sup> In Faisal and Fugenes studies, there was a positive relation between PW's preference for cesarean and their educational level.<sup>[6,37]</sup> In Karlstrom and Hsu studies, women with lower educational levels had a higher preference to make cesarean (a negative relation).<sup>[24,35]</sup> Some studies did not report any significant relation between women's preference for cesarean and their educational level.<sup>[36,47-49]</sup> According to this study and some mentioned studies it seems that the educational level of women can probably be one of the factors that may affect the women's preference for CD, however this relation didn't observe in some studies. In this study, we observed a significant relationship between PW's preference for CD and doctor's advice. The results of pang study show that 5.8% of PW preferred cesarean because of doctor's advice CD.<sup>[31]</sup> Furthermore in Mohammadpour study observed that doctor' advice is one of the reasons for selection of CD in studied PW.<sup>[50]</sup> Maybe some doctors advice PW to perform CD (after previous CD) because risks of VBAC can be potentially catastrophic in the setting of uterine rupture, however in Landon study was observed that history of multiple CDs is not associated with an increased rate of uterine rupture in women attempting VD compared with those with a single prior CD.<sup>[51]</sup> Most of PW with preference for CD probably do it in the future. For example in Horey study observed that 97.1% of those indicating preference for CD achieved it, while 64.8% of those planning VD achieved this mode of birth.<sup>[52]</sup> Clinicians can change PW preference to cesarean with counsel to them, especially in women without clinical indications. The findings of this study may have implications for researchers as well as clinicians. With attention, this study that was cross-sectional and, therefore, direct causation is not known; we suggest that further studies be undertaken to examine factors influencing PW's childbirth preferences in more detail, on a larger scale, and prospectively; especially with use of Randomized controlled trials as recommended by Dodd study.<sup>[53]</sup>

**Table 2:** OR estimates of PW's preference for CD based on the multivariate logistic regression model

Variables	$\beta$	OR	95% CI	P value
PW's educational level	1.35	3.86	1.85, 8.05	<0.001
Doctor's advice	1.27	3.55	1.21, 10.43	0.021

OR=Odds ratio, PW=Pregnant woman, CD=Cesarean delivery, CI=Confidence interval



## CONCLUSIONS

In this study, most of PW (with previous CD) preferred to have a CD. Maybe various factors influenced PW to prefer CD but in this study PW's educational level and doctor's advice were important factors. The much upper rate of CD preference after previous CD in this study suggests the need to counsel PW, who must choose between a VD and a repeated CD after a prior CD.

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