

Rising cesarean section rates, a patient's perspective: experience from a high birth rate country

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Summary

Purpose of investigation: To investigate the effect of social class, education and antenatal care on cesarean section (CS) rate and women's preference for CS. **Materials and Methods:** This is a descriptive study performed on 509 women attending postnatal clinics in three primary care units in Ismailia governorate, Egypt. The study performed via a structured questionnaire including questions related to background socio-demographic data, questions related to obstetrical history for the last pregnancy and delivery, and questions related to economic standards. **Results:** The study included 266 participants (52.3%) that delivered by CS in their last delivery. CS rate was significantly higher in highly educated women and high economic standard. Only 29 (7.7 %) reported that they had preferred CS as a method of delivery. Educational level and economic standards significantly affected the proportion of women preferring CS as a method of delivery ($p = 0.02$ and $p = 0.01$, respectively). In a stepwise logistic regression model, significant factors affecting CS rate were: the method of delivery preferred ($p < 0.005$) and educational level ($p < 0.05$). **Conclusion:** Educational level and economic standards significantly affected women's preference towards CS and CS rate.

Key words: Cesarean delivery; Women preference for CS; Social class; Education; Antenatal care.

Introduction

Cesarean section (CS) is one of the most commonly performed surgical procedures, ranked first in industrialized world [1]. The rates continue to rise despite lack of evidence that mortality or morbidity figures are improved, on the contrary CS is associated with increased complications as maternal mortality, deep venous thrombosis, visceral injury, and hysterectomy [2]. These complications increase with repeated CS [3].

In Egypt, the CS rate has experienced a fivefold increase over the past 20 years [4]. The most recent Egyptian Demographic and Health Survey (EDHS) [4] has shown that overall CS rate in Egypt was 27.6% compared to a rate of 5% in 1992. This drastic increase has urged the authors to investigate its underlying causes. In a previous study [5], the authors investigated the obstetricians' perspectives and attitudes towards CS. They found that a majority of obstetricians in Egypt ignore many obstetric procedures and maneuvers that could reduce cesarean section rates such as external cephalic version for breech presentation, selected vaginal breech delivery, scalp pH measurement, and tubal sterilization during CS.

Other studies have focused on women's attitudes towards CS. Several studies have focused on maternal request as the sole indication for cesarean section [6, 7]. Maternal request for CS as a preferred mode of delivery range between 7-17 % of pregnant women studied at their second or third

trimesters [8]. Several factors can contribute to maternal decision-making. Fear of pain, genital trauma or altered sexual function can lead women to prefer abdominal route of delivery [9]. Several studies have addressed the relationship between socioeconomic and educational levels and CS rate. Fairly *et al.* in 2010 [10] have shown that CS rates significantly differ according to both individual social class and area deprivation.

Knowledge can undoubtedly be considered as a milestone in constructing individual's decision-making. An important source of knowledge to a pregnant woman is medical health professional during antenatal care sessions. Antenatal care is considered adequate if it entails appropriate number of visits based on risk level. Overall, low risk patients need to be seen less frequently during pregnancy. Adequate antenatal care (ANC) sessions should be able to detect and manage high risk patients and to provide adequate information and guidance to pregnant women in different aspects including the route of delivery [11].

The current study aims at shedding light on the women's aspect of CS decision-making, by identifying the effect of social class, education, and antenatal care on women preference and CS rate.

Materials and Methods

This is a descriptive study of information gathered from 509 women attending postnatal clinics in three primary care units in Ismailia governorate which is located in northeastern part of Egypt in October 2010. The information was collected via a structured questionnaire. The questionnaire included three sections. The first

Table 1. — Background characteristics of the respondents.

Sample characteristics (N=509)	(%)
Age group	
16-20	4.5
21-30	62.5
31-40	29.4
41-45	3.6
Education	
Illiterate	28.5
Primary	54.4
Secondary	16.1
High Education	1
Employment	
Employed	20.4
Not employed	79.6
Parity	
Para 1	17.1
Multipara	82.9
ANC	
Inadequate	41.7
Adequate	58.3

section included background socio-demographic data (age, marital status, work status, and educational level). The second section included obstetrical history for the last pregnancy and delivery. Items included questions related to place and standard of antenatal care. Adequateness of ANC was determined via number of visits, blood tests and ultrasonography performed, and nutritional supplementation. Other questions related to complicated pregnancy, place, timing, and mode of last delivery were asked. The third section included questions related to economic standard including household characters and electric devices and motor vehicle possession.

As a large number of women in study were illiterate, direct questioning, explanation, and filling of the questionnaire was done by the authors or health attendants. The rest of the study group filled the questionnaire themselves with access for help if needed.

ANC was classified as good if it included more than four visits, blood tests, ultrasonography performed, and supplementation given, average if two or more items were present, and poor if two or more items were absent. Economic level was divided into standard five wealth quintiles. Main outcome measures were type of delivery and patient preference. Those who had complications of pregnancy or previous CS were excluded from analysis. Complications included medical or surgical conditions during pregnancy, malpresentations, or fetal macrosomia \leq four kg.

Data were collected and analyzed by Statistical Package for the Social Sciences (SPSS) for windows version 19.0. Chi-square test was used relating different variables to the outcome measures. A stepwise logistic regression model was used to detect the most significant variables affecting CS rate. Statistical significance was defined at $p < 0.05$.

Results

Table 1 shows the basic characteristics of the whole group (n = 509). It shows that the majority of participants (62.5%) were in the age group of 21-30 years. Most of participants did not receive secondary or higher education. Primary education/illiteracy accounted for 82.9% of the study

Table 2. — CS rates based on educational levels, employment status, ANC, and wealth quintiles.

	Normal Delivery N (%)	CS N (%)	Total N (%)	Total N	p
Education					
Illiterate	50 (80.6)	12 (19.4)	62 (16.4)		
Primary	52 (64.2)	29 (35.8)	81 (21.5)		
Secondary	92 (48.9)	96 (51.1)	188 (49.9)	377	<0.05*
High	20 (43.5)	27 (56.5)	46 (12.2)		
Employment					
Employed	39 (50.6)	38 (49.4)	77 (20.4)		
Unemployed	174 (58)	126 (42)	300 (79.6)	377	0.25
ANC					
Poor	41 (66.1)	21 (33.9)	62 (16.4)		
Average	49 (55.7)	39 (44.3)	88 (23.3)	377	0.24
Good	123 (54.2)	104 (45.8)	227 (60.3)		
Wealth					
Level 1	48 (70.6)	20 (29.4)	68 (18.2)		
Level 2	41 (62.1)	25 (37.9)	66 (17.7)		
Level 3	46 (60.5)	30 (39.5)	76 (20.5)	372	<0.05*
Level 4	47 (54.7)	39 (45.3)	86 (23.1)		
Level 5	31 (40.8)	45 (59.2)	76 (20.5)		

*significant at 0.05

group. Most of the participants (79.6%) were unemployed at time of interrogation. The majority of participants (82.9%) were multiparae, and the majority (58.3%) received good ANC in their last pregnancy

The participants that delivered via CS were 266 (52.3%) in their last delivery, 84 participants (16.5%) had a complicated last pregnancy, while 76 (14.9%) had a previous one or more CS. Those who had complicated pregnancies or previous CS were excluded from analyses. The remaining participants were 377 (74%), 164 (43.5%) of them had undergone CS for their last delivery. Of this number, 67 women (40.9%) had their CS planned.

Table 2 relates the CS rate to educational level, employment status, ANC standard, and wealth status. CS rate was significantly higher in highly educated women (56.5%) compared to illiterates (19.4%), and those with high standard of living; wealth level 5 (59.2%) compared to low economic standard; wealth level 1 (29.4%). Employment status and level of ANC received during pregnancy failed to show significant differences.

Out of 377 participants, only 29 (7.7 %) reported that they had preferred CS as a method of delivery. In most of this group, 25 (86.2%) had CS in their last delivery ($p < 0.05$).

Table 3 shows the relationship between educational level, employment status, ANC standard and wealth status, and the number of participants preferring CS as a mode of delivery. Significant differences were shown in educational level ($p = 0.02$) and wealth level ($p = 0.01$).

The following factors namely, educational level, employment status, ANC level, wealth level, and method of

Table 3. — Mode of delivery preference rates based on educational levels, employment status, ANC, and wealth quintiles.

	Prefer Normal Delivery N (%)	Prefer CS N (%)	Total N (%)	Total N	p
Education					
Illiterate	61 (98.4)	1 (1.6)	62 (16.4)		
Primary	75 (92.4)	6 (7.4)	81 (21.5)		
Secondary	173 (92.4)	14 (7.5)	188 (49.9)	377	0.02*
High	38 (82.6)	8 (17.4)	46 (12.2)		
Employment					
Employed	68 (88.3)	9 (11.7)	77 (20.4)		
Unemployed	279 (93.3)	20 (6.7)	300 (79.6)	377	0.11
ANC					
Poor	60 (96.8)	2 (3.2)	62 (16.4)		
Average	81 (91.4)	7 (8.6)	88 (23.3)	377	0.38
Good	206 (90.7)	21 (9.3)	227 (60.3)		
Wealth					
Level 1	64 (94.1)	4 (5.9)	68 (18.2)		
Level 2	62 (93.3)	4 (6.1)	66 (17.7)		
Level 3	75 (98.7)	1 (1.3)	76 (20.5)	372	0.01*
Level 4	78 (90.7)	8 (9.3)	86 (23.1)		
Level 5	63 (82.8)	13 (17.2)	76 (20.5)		

*significant at 0.05

delivery preferred were entered in a stepwise logistic regression model in relation to the method of delivery performed. Based on univariate analysis, average and good antenatal care were grouped into one category. The same was applied to the first three levels of education and the lowest three levels of wealth. The model was highly significant, $p < 0.005$. Significant factors affecting CS rate that fitted the one final model were: the method of delivery preferred ($p < 0.005$) and educational level ($p < 0.05$, Table 4).

Discussion

The concept of shared decision-making has been gaining popularity over the last two decades among patients, providers and policy makers [12]. Shared decision-making entails a combined decision making by doctors and patients guided by best evidence available and adjusted according to the specific characteristics and values of the patient [13]. Although this concept has been endorsed at several clinical situations in obstetrics and gynecology [14, 15], mode of delivery decisions have not, so far, adopted this model of shared decision making [8]. This paper attempts to discuss how this model can fit the process of CS decision-making in our patients:

The specific characteristics of the patient

The 2008 EDHS [4] has shown that more than one-quarter of deliveries in the five-year period before the 2008 EDHS survey were by CS. Women delivering in a private health facility were slightly more likely than

Table 4. — Stepwise logistic regression analysis between mode of delivery and expected influencing factors.

	Coefficient	SE	Wald test	DF	p
Mode of delivery preferred	2.14	0.5	15.04	1	0.00**
ANC	0.33	0.33	0.96	1	0.32
Education	1.04	0.36	8.26	1	0.004**
Wealth status	0.31	0.32	0.91	1	0.34
Constant	-1.88	0.43	19.05	1	0.00**

** Highly significant at 0.05

#The employment status was dropped out of the model because it was highly insignificant ($p = 0.9$)

women delivering in a government facility to have a cesarean delivery. Cesarean deliveries were more common in urban rather than rural areas, in lower rather than upper Egypt. The rate of cesarean deliveries peaked among women in the highest wealth quintile and the most highly educated sector. Other studies have shown that cesarean delivery increase in the higher socioeconomic class and less deprived areas. The present study conforms to these results. CS rate was significantly higher in highly educated women (56.5%) compared to illiterates (19.4%), and those with high standard of living; 5th wealth quintile (59.2%) compared to low economic standard; 1st wealth quintile (29.4%).

The increased CS rate in women with high standard of living can be attributed to the perception that CS comes with less pain and suffering compared to normal delivery. At the same time, these women can afford the higher cost of the operation. Of note, CS rate was not affected by the ANC; which means that lack of proper counseling and education during that period added to that belief. Also, the physician's attitude which plays a major role in decision-making had further influence on the outcome of delivery.

Information given to the patient

Accurate communication of the chances of clinical outcome is an essential tool for proper decision making by the patient [2]. It is assumed that ANC visits provide an excellent opportunity to detect and treat high risk patients and to provide adequate information guided by best evidence on the best method of delivery [11]. The quality of healthcare program differ according to level of development of healthcare provider area [16,17]. The quality of program depend on several factors including number of visits, availability of equipment as ultrasonography, provision of blood tests, and above all, adequate care and time given by the healthcare provider. Assuming proper antenatal care is provided, it would be expected that the CS rate drop to a minimum in a non-complicated pregnancy. The present authors arbitrarily classified ANC service provided to their patients into adequate, average, and poor according to the number of visits (< 4; 4 or

more), provision of ultrasonography examination (yes, no), provision of blood testing (yes, no), and provision of supplements (yes, no) [4, 11]. They failed to find significant differences between the three groups regarding CS rate or prior patient's preference to perform CS.

The result of this study is in line with other studies that devaluated the input of maternal CS preference rate that ranged between (0.3-14%) in overall CS rate [18, 19]. The authors found maternal CS preference rate to be 7.7% of the whole group who had uncomplicated pregnancies. However this percentage was significantly more represented in the group who had cesarean delivery. This association was the most significant in logistic regression.

This study presents a very high CS rate (52.3%) representing one of the highest CS rates in Egypt. This can be explained in part by the area of the study. Ismailia governorate is one of the Urban Lower Egypt governorates with an average socio-economic standards and an approaching value of CS and normal delivery costs. However, a rising and alarming CS trends can be depicted.

CS decision is a multi-disciplinary procedures with the client (patient) and provider (obstetrician) at the core. Several studies have highlighted the role of obstetricians' views and attitudes in determining CS rates. This study shows that socio-economic and educational levels together with patient's preference significantly affect CS rates, although patient preference appear to be in a lower position as compared to other factors including obstetricians' preference. A clue towards this conclusion is a lack of significant effect of ANC on CS rate.

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References

- [1] Petrou S, Henderson J, Glazener C.: "Economic aspects of cesarean section and alternative modes of delivery". *Best Pract. Res. Clin. Obstet. Gynecol.*, 2001, 15, 145.
- [2] Lyrelly A.D., Mitchell L.M., Armstrong E.M., Harris L.H., Kukla R., Kuppermann M., et al.: "Risks, values and decision making surrounding pregnancy". *Obstet. Gynecol.*, 2007, 109, 979.
- [3] Gedikbasi A., Akyol A., Bingol B., Cakmak D., Sergin A., Unceri R., et al.: "Multiple repeated cesarean deliveries: operative complications in the fourth and fifth surgeries in urgent and elective cases". *Taiwan J. Obstet. Gynecol.*, 2010, 49, 425.
- [4] El-Zanaty F., Way A.A.: "Egypt Demographic and Health Survey". Cairo, Egypt: Ministry of Health and Population [Arab Republic of Egypt], National Population Council [Arab Republic of Egypt], El-Zanaty and Associates, and ORC Macro, 2009.
- [5] Shaaban M.M., Ahmed W.S., Kedr Z., Elsayed H.F.: "Obstetricians' perspective towards cesarean section delivery based on professional level: experience from Egypt". *Archiv. Gynecol. Obstet.*, 2012, 285, 317. doi 10.1007/s00404-012-2277-7.
- [6] Bergholt T., Østerbrg B., Legarth J., Webster T.: "Danish obstetricians' personal preference and general attitude to elective cesarean section on maternal request: A national postal survey". *Acta Obstet. Gynecol. Scand.*, 2004, 83, 262.
- [7] Jacquemyna Y., Ahankoura F., Martensb G.: "Flemish obstetricians' personal preference regarding mode of delivery and attitude towards caesarean section on demand". *Europ. J. Obstet. Gynecol. Reprod. Biol.*, 2003, 111, 164.
- [8] Mazzoni A., Althabe F., Liu N.H., Bonotti A.M., Gibbons L., Sanchez A.J., et al.: "Women's preference for caesarean section: a systematic review and meta-analysis of observational studies". *BJOG*, 2011, 118, 391. doi: 10.1111/j.1471-0528.2010.02793.x. Epub 2010 Dec 7.
- [9] Lukasse M., Vangen S., Oian P., Schei B.: "Fear of childbirth, women's preference for cesarean section and childhood abuse". *Acta Obstet. Gynecol. Scand.*, 2011, 90, 33.
- [10] Fairley L., Dundas R., Leyland A.H.: "The influence of both individual and area based socioeconomic status on temporal trends in caesarean sections in Scotland 1980-2000". *BMC Public Health*, 2011, 18, 330. doi 10.1186/1471-2458-11-330.
- [11] Villar J., Bergsjö P.: "Scientific basis for the content of routine antenatal care I. Philosophy, recent studies, and power to eliminate or alleviate adverse maternal outcomes". *Acta Obstet. Gynecol. Scand.*, 1997, 76, 1.
- [12] Charles C., Gafni A., Whelan T.: "Shared decision making in the medical encounter: What does it mean? (or it takes at least two to tango)". *Soc. Sci. Med.*, 1997, 44, 681.
- [13] Legare F., O'Connor A.C., Graham I., Saucier D., Côté L., Cauchon M., Paré L.: "Supporting patients facing difficult health care decisions; Use of Ottawa Decision Support Framework". *Can. Fam. Physician*, 2006, 52, 476.
- [14] ACOG: "Practice bulletin 88. Invasive prenatal testing for aneuploidy". *Obstet. Gynecol.*, 2007, 113, 451.
- [15] ACOG: "Practice bulletin 101. Ultrasonography in pregnancy". *Obstet. Gynecol.*, 2009, 110, 1459.
- [16] [No authors listed]: "Antenatal care assessed". *Lancet*, 1986, 10, 1072.
- [17] Fink A., Yano E., Goya D.: "Prenatal programs: what the literature reveals". *Obstet. Gynecol.*, 1992, 80, 867.
- [18] Chu K.H., Tai C.J., Hsu C.S., Yeh M.C., Chien L.Y.: "Women's preference for cesarean section and differences between Taiwanese women undergoing different modes of delivery". *BMC Health Serv. Res.*, 2010, 26, 138. doi: 10.1186/1472-6963-10-138.
- [19] Karlström A., Nstedt A., Johnsson M., Hildingsson I.: "Behind the myth-few women prefer cesarean section in the absence of medical or obstetrical factors". *Midwifery*, 2011, 27, 620. doi 10.1016/j.midw.2010.05.005 Epub 2010 Jul 13.

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