ORIGINAL ARTICLE

Determinants of preference for elective caesarean section in Hong Kong Chinese pregnant women

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Objective To find the clinical and socio-demographic determinants for Hong Kong Chinese women who preferred elective caesarean section.

Design Cross-sectional interview survey.

Setting University teaching hospital, Hong Kong.

Participants A cohort of consecutive Hong Kong Chinese pregnant women (n=660) attending a government-funded obstetric unit catering deliveries in the New Territories in Hong Kong in 2002.

Main outcome measures The clinical and socio-demographic determinants of preference for elective caesarean section, in women who could have a trial of vaginal delivery.

Results The overall prevalence for maternal preference for elective caesarean section was 16.7% (95% confidence interval, 13.8-19.6). The factors associated with preferring elective caesarean section were: previous elective caesarean section (odds ratio=7.6; 95% confidence interval, 2.0-28.7) and previous emergency caesarean section (3.8; 1.8-8.2). Among nulliparous women, the prevalence of preference for elective caesarean section was 16.8% (95% confidence interval, 13.0-20.6). Conception by in-vitro fertilisation was found to be significantly associated with preferring elective caesarean section in nulliparous women (odds ratio=5.2; 95% confidence interval, 1.0-26.4).

Conclusion Previous caesarean section and conception by in-vitro fertilisation were determinants for women preferring elective caesarean section.

Introduction

Increasing caesarean section (CS) rates are a trend observed worldwide.[1-6] The CS rate rose from 4% in the 1970s to 21.5% in 2001 in the United Kingdom, from 30.3% in 1978-1979 to 50.8% in 1994 in Brazil, from 11.1% in 1988 to 38.1% in 2000 in South Korea, and from 4.7 to 22.5% over the past three decades in Shanghai.[4,6-8] In Hong Kong, the CS rate rose from 16.6 to 27.4% between 1987 and 1999, representing a 65% increase over 12 years.[1]

The exact reasons for the increase in CS rate are unknown. One of the major reasons could be the improved safety of surgical and anaesthetic skills in modern obstetrics.[9] Other postulated reasons include changing attitudes towards CS among staff and patients. It has been shown that a significant number of obstetricians would agree to perform an elective CS without an obstetrical indication upon maternal request.[10-13] Thirty-eight percent of Danish obstetricians agreed to perform elective CS if requested by the mother.[10] The corresponding figures in the United Kingdom and Israel were 69% and 45% respectively.[11,12] A survey of the attitude of obstetricians, midwives, and trainees (n=194) in our unit showed that 58% of them would agree that elective CS be offered in response to maternal requests.[13]

Because of the increasing emphasis on patients' participation in medical decision in recent years, women's demands for CS has become a main reason for the abdominal route of delivery.[11,14-16] In a 2-year audit in an Australian teaching hospital, maternal choice was the commonest indication for elective CS.[17] In another audit of a teaching hospital in London in 1999, the major indications of all elective CS were previous CS (44%), maternal request alone with no obstetric indications (14%), and maternal refusal of a trial of vaginal breech delivery (13%).[14] In the latter unit, although a trial of vaginal delivery (VD) was the recommended mode of delivery

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(MOD) after one previous CS or breech presentation, the three commonest indications for elective CS were, therefore, all related to the maternal refusal of VD.[14]

There were fewer reports on women's preference for the MOD in Asian countries. In Singapore, with a population consisting of ethnic Chinese, Malay, and Indians—only 3.7% of the mothers preferred elective CS.[18] In South Korea, less than 5% of the women preferred elective CS.[19] To date, there were no data on MOD attitudes among Hong Kong Chinese women. We therefore aimed to find the clinical and socio-demographic determinants for preferred elective CS in the Hong Kong Chinese population.

香港華籍孕婦傾向選擇剖腹生產的決定因素

目的 探討香港華籍孕婦選擇剖腹生產的臨床和社會人口方面的原因。

設計 橫面訪問調查。

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參與者 於2002年前往香港新界一所政府資助產科服務單位的華籍孕婦，共660人。

主要結果測量 可嘗試陰道分娩的孕婦，其傾向選擇剖腹生產的臨床和社會人口方面的原因。

結果 孕婦傾向選擇剖腹生產的整體比率為16.7%（95%置信區間為13.8-19.6）。與此相關的因素有：過往曾經選擇剖腹生產（風險比率=7.6；95%置信區間為2.0-28.7）；過往曾經急症剖腹生產（3.8；1.8-8.2）。至於從未生育的女性，傾向選擇剖腹生產的比率為16.8%（95%置信區間為13.0-20.6）。從未生育的女性以體外授精方式懷孕，與她們多傾向選擇剖腹生產有重要關係（風險比率=5.2；95%置信區間為1.0-26.4）。

結論 過往曾經剖腹生產和以體外授精方式懷孕，是孕婦傾向選擇剖腹生產的決定因素。

Methods

A cross-sectional survey was conducted in an obstetric unit of a government-funded hospital in Hong Kong during the period 2002. The delivery rate of the unit during the study period was approximately 6000 per year. In 2002, 21% of the parturients delivered by CS (5.7% by elective CS, 15.4% by emergency CS). With a 24-hour epidural analgesia service available, 20% of the women received epidural analgesia or anaesthesia during delivery. Over 98% of the parturients were ethnically Chinese.

Obstetric service was free in government-funded hospitals and all Hong Kong residents were eligible, and approximately 75% of Hong Kong women delivered in such hospitals. There were no planned home birth or community centres designated for deliveries. In government-funded hospitals, requests for elective CS without an obstetrical indication were not entertained. Women who wished to have delivery in the study unit were seen in the out-patient clinic of the unit at least once. The majority of women had no antenatal complications. They were then referred for continuation of antenatal care at the maternity and child health centres until delivery. Midwives were not dedicated to look after individual's pregnancies. On a voluntary basis, mothers were encouraged to attend antenatal classes in groups in both the government-funded obstetric unit and in community centres, where the general issues of pregnancy and childbirth were addressed.

Hong Kong Chinese pregnant women attending their first antenatal visit in the obstetric unit who were suitable for a trial of VD were included in the study. Women known to have had two previous CSs, psychiatric disease, medical disease, multiple pregnancies, congenital abnormalities and previous maternal or foetal complications necessitating intensive care unit admissions were excluded. It was the unit's policy that women who had one previous uncomplicated lower segment CS were encouraged to undergo a VD. If these women insisted on elective CS, the procedure was arranged after adequate counselling. All potential subjects were invited to participate by a research nurse. Written consent was obtained; the relevant institutional review board had approved the study protocol.

Antenatal care was not affected by participation in the study and the medical personnel involved in the clinical management of the patients were not privy to information obtained from the survey.

Questionnaires

A structured interview was conducted by a single research assistant. Socio-demographic data, and women's obstetrical and gynaecological history were recorded. The women's preference for the MOD of the index pregnancy was explored (given the hypothetical situation that they had an uncomplicated antenatal course with freedom to choose VD or elective CS). The most important reason for each mother's choice was recorded. At the end of the interview, women were asked to complete a validated Chinese version of General Health Questionnaire.[20]

Sample size

A sample size of 503 produces a 95% confidence interval (CI) equal to the sample proportion ±0.03 when the estimated proportion is 0.145.[21]

Statistical tests

Statistical analysis was performed with Statistical Package for Social Sciences (Version 10.1; SPSS Inc, Chicago [IL], US). Univariate analyses were used to identify clinical and socio-demographic variables associated with

TABLE 1. Socio-demographic variables of the participating women, n=629*

Socio-demographic variable	No. (%)
Mean age (SD) [years]	29.8 (5.0)
Maternal age ≥35 years	101 (16.1)
Maternal age ≤18 years	10 (1.6)
Mean gestation at survey (SD) [weeks]	17.0 (5.9)
Educational level (n=624)†	
Primary or below	22 (3.5)
Secondary	466 (74.7)
Tertiary or above	136 (21.8)
Occupation (n=595)†	
Housewife	261 (43.9)
Professional	6 (1.0)
Managerial	71 (11.9)
Skilled non-manual	192 (32.3)
Skilled manual	17 (2.9)
Partly skilled manual	39 (6.6)
Unskilled manual	9 (1.5)
Family monthly income (HK$) [n=623]†	
<10 000	116 (18.6)
10 000-20 000	201 (32.3)
20 001-30 000	140 (22.5)
>30 000	166 (26.6)
Drinker	40 (6.4)
Smoker	105 (16.7)
History of substance abuse	16 (2.5)
Marital status (married)	580 (92.2)

* Data are shown in No. (%), except otherwise stated
† Data were missing for some subjects

TABLE 2. Clinical variables of the participating women, n=629*

Clinical variable	No. (%)
History of gynaecological surgery	
Surgical evacuation of uterus	212 (33.7)
Surgery to cervix	9 (1.4)
Myomectomy	5 (0.8)
Hysteroscopic surgery	2 (0.3)
Past pregnancy	
Termination of pregnancy	226 (35.9)
Miscarriage	85 (13.5)
Epidural analgesia during childbirth	36 (5.7)
Normal vaginal delivery/complication	177 (28.1) / 10 (1.6)
Vaginal instrumental delivery/ complications	36 (5.7) / 3 (0.5)
Emergency caesarean section/ complications	39 (6.2) / 6 (1.0)
Elective caesarean section/ complications	10 (1.6) / 0
Stillbirth or neonatal death	5 (0.8)
Present pregnancy	
Planned pregnancy	487 (77.4)
Assisted conception	20 (3.2)
In-vitro fertilisation	8 (1.3)
Threatened miscarriage	77 (12.2)
Psychometric score	
Mean General Health Questionnaire score (SD)	4.5 (2.8)

* Data are shown in No. (%), except otherwise stated

preferring elective CS. Logistic regression analysis was used to adjust for collinearity among the variables. The significance and adjusted odds ratio (OR) of determinant variables for preferring elective CS were thus obtained.

Results

During the study period, 660 Hong Kong Chinese women fulfilled the inclusion criteria and were invited to participate in the study. A total of 629 women consented and completed the survey; 31 women declined to participate.

The socio-demographic and clinical characteristics of the participants are listed in Tables 1 and 2 respectively. Fifty-nine percent of the respondents were nulliparous. The overall prevalence of preference for elective CS was 16.7% (95% CI, 13.8-19.6).

Univariate analyses of the socio-demographic and clinical variables from all valid respondents were performed. Table 3 shows the results of the potential explanatory variables tested to have an association with preference for elective CS with P≤0.2.[22]

Logistic regression analysis was performed with the potential explanatory variables for which P≤0.2 were detected in the univariate analyses (Table 3).[22] After adjustment, prior elective CS (OR=7.6; 95% CI, 2.0-28.7) and prior emergency CS (OR=3.8; 95% CI, 1.8-8.2) were the only variables having a significant association with the women's preference for elective CS for the index pregnancy.

The most important reasons leading to the women's preference for VD and elective CS are listed in Table 4. Since previous emergency CS and elective CS were found to be the determinants for preferring elective CS at the index pregnancy, analyses were repeated for the 370 women with no prior childbirth experience. The preference for elective CS among nulliparous women was 16.8% (95% CI, 13.0-20.6).

Univariate analyses were performed on the socio-demographic and clinical variables among the nulliparous women. The variables found to have P≤0.2

TABLE 3. Socio-demographic and clinical variables associated with preferring elective caesarean section (CS) at univariate analyses (P≤0.2)

Variable	CS, n=105	Vaginal delivery, n=524	P value
Continuous variables*, mean (SD)			
Maternal age (years)	30.7 (4.8)	29.7 (5.0)	0.05
Gestation at survey (weeks)	15.9 (5.4)	17.2 (6.0)	0.06
Dichotomous variables†, No. (%)			
Family monthly income >HK$30 000	35 (33.3)	131 (25.0)	0.08
History of substance abuse	0	16 (3.1)	0.07
Previous myomectomy	2 (1.9)	3 (0.6)	0.16
Previous normal vaginal delivery	19 (18.1)	158 (30.2)	0.01
Previous emergency CS	17 (16.2)	22 (4.2)	0.00
Complications of previous emergency CS	3 (2.9)	3 (0.6)	0.03
Previous elective CS	6 (5.7)	4 (0.8)	0.00
In-vitro fertilisation	3 (2.9)	5 (1.0)	0.11

* ***t* test**
† **Chi squared test**

TABLE 4. Frequency distribution of the most important reasons for preferring vaginal delivery (VD) and elective caesarean section (CS)

Reasons	All women (%)	Nulliparous women (%)
For preferring VD	n=508	n=308
VD is the natural way of delivery	36.3	38.3
VD is safer for the baby	22.3	19.5
VD has quicker post-delivery recovery	21.3	21.2
VD is safer for the mother	15.5	17.2
VD has less overall pain	4.2	3.6
Others	0.5	0.3
For preferring elective CS	n=105	n=62
CS is safer for the baby	35.3	33.9
Fear of vaginal birth	23.0	22.6
CS has less overall pain	18.0	17.7
CS has less vaginal trauma	13.7	21.0
CS allows a better control of time of birth	8.9	1.6
Others	1.4	3.2

are shown in Table 5.[22]

Logistic regression was performed with the potential explanatory variables listed in Table 5.[22] After adjustment for collinearity, only conception by in-vitro fertilisation was found to be significantly associated with preferring elective CS (OR=5.2; 95% CI, 1.0-26.4).

Among nulliparous women, the most frequently cited reason for choosing elective CS and VD are shown in Table 4.

Discussion

This paper reports the determinants for preferring elective CS in a sample of Hong Kong Chinese pregnant women. Our finding that previous CS was a significant determinant for such a preference concurred with studies conducted in the western populations.[23,24] In a randomised controlled trial, an individualised prenatal education and support programme was offered to women with previous CS, but did not demonstrate any clinically significant increase in the rate of vaginal births after CS.[25] Thus, to reduce the overall CS rate, reducing the proportion of first deliveries by CS appears pertinent.

Our results showed that women who had had a previous elective CS were twice as likely to prefer elective CS than women who had had emergency CS. Since this was a cross-sectional study, it is impossible to determine whether this difference was due to a priori difference in

TABLE 5. Socio-demographic and clinical variables associated with preferring elective caesarean section (CS) at univariate analyses of nulliparous women (P≤0.2)

Variable	CS, n=62	Vaginal delivery, n=308	P value
Continuous variables*, mean (SD)			
Maternal age (years)	29.9 (4.8)	28.5 (5.0)	0.04
Gestation at survey (weeks)	15.9 (5.5)	17.2 (6.2)	0.13
Dichotomous variables†, No. (%)			
Family monthly income >HK$30 000	25/61 (41.0)	93/305 (30.5)	0.11
History of substance abuse	0/62	10/308 (3.2)	0.15
Marital status (married)	59/61 (96.7)	275/307 (89.6)	0.08
In-vitro fertilisation	3/62 (4.8)	4/308 (1.3)	0.06

* **Mann-Whitney *U* test**
† **Chi squared test**

preference for a certain MOD. Thus, women who had undergone emergency CS could have been those who initially wished to deliver vaginally and those who had undergone elective CS could have been those who wished to deliver by elective CS. A longitudinal cohort study of women's preference at different stages throughout their pregnancy might be able to provide information as to the causative factors for such differences.

Among nulliparous women, conception by in-vitro fertilisation was a significant determinant of preference for elective CS. It has been well described that the elective CS rate in in-vitro fertilisation pregnancies was higher than that for natural conception.[26-28] The exact indications for CS were not known, but seem to imply that such women's exceptional anxiety probably has some influence.

The 16.7% prevalence for preferring elective CS in our study cohort might not be representative of the Hong Kong pregnant women population, because of potential selection bias. It is well known to women in Hong Kong that government-funded units do not perform elective CS for non-clinical indication. Women with strong preferences for elective CS might therefore have selected private maternity care. Nonetheless, we encountered a higher prevalence preferring elective CS compared to the figures reported from other populations. Prevalence figures reported from the United Kingdom, Sweden, and Australia were 14.5, 8.2, and 6.4% respectively.[21,23,29] Our figure was also higher compared to other Asian countries such as Singapore (3.7%) and Korea (5%).[18,19] However, the latter two studies were performed in non-pregnant female subjects. Our study data provide no explanation for the high prevalence for preferring elective CS even among nulliparous women.

The reasons cited by our pregnant women who preferred elective CS were similar to those of other populations.[18,19,21,29] Areskog et al[30] suggested that 6% of pregnant women experience severe fear during pregnancy. Concerns for the safety of the baby and labour pains were partly responsible for such fear.[31] It is well recognised that one manifestation of maternal fear in pregnancy was a request for elective CS.[30-33] To explain the high prevalence of the preference for elective CS in our population, a study into fear in pregnancy of our population is mandatory.

Women reported 'safety of the baby', 'fear of vaginal birth', and 'pain associated with vaginal birth' as important reasons for choosing elective CS. A logical approach to reducing maternal requests for elective CS is to alleviate fear regarding these aspects. Observational studies have shown that psychotherapy and extra obstetric support were associated with fewer women requesting elective CS at term.[32,33] To date, there were only two randomised controlled trials focusing on whether interventions were useful to reduce the number of women making such requests. Fraser et al[25] used individualised educational programme in women with previous CS and Saisto et al[34] used cognitive treatment in women who suffered from fear of vaginal birth. Both studies showed that there were no significant differences between the intervention and control groups with respect to the women's request for elective CS. There were also no differences in the clinical and psychological outcomes of both groups of women. These results may imply that once fear is established, treatment is not of significant clinical benefit.

In conclusion, one in six of our study cohort preferred elective CS. Previous CS is a determinant of this preference. Women who conceived by in-vitro fertilisation preferred elective CS. Women who preferred elective CS are concerned with safety of the baby, fear of vaginal birth, and pain associated with delivery. Further studies into quantification and identification of the causes and objects of fear among Chinese pregnant women may help in understanding the reasons why they prefer elective CS.

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