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A longitudinal observational study of preference for elective caesarean section among nulliparous Hong Kong Chinese women

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Objective To establish whether women's preference for elective caesarean section (ELCS) changes as gestation advances.

Design A prospective longitudinal observational study.

Setting Two units providing obstetric care in Hong Kong, one public and one private.

Sample Five hundred and one nulliparous Chinese pregnant women attending their routine fetal anomaly scan in either unit.

Methods Consented subjects had two interviews using a structured questionnaire at 18–22 weeks and 35–37 weeks of gestation, respectively. Multivariate analysis was performed to identify determinants for preferring ELCS at the two gestational ages.

Main outcome measure The preferences for the mode of delivery at the two gestational ages.

Results The prevalence of maternal preference for ELCS in the study cohort was 17.2% (95% CI 13.9–20.5) and 12.7% (95% CI 9.6–15.8) at mid-trimester and at term, respectively. Significantly more women who preferred ELCS at mid-trimester changed to a trial of vaginal delivery (VD) at term than vice versa (42.0 versus 3.8%). The partner's preference for ELCS was a significant determinant for women preferring ELCS throughout the antenatal period. Among the women booked in the public sector, more women who preferred ELCS at term changed to deliver in private hospitals than those who preferred VD (46.2 versus 9.7%).

Conclusions Many women changed from preferring ELCS to preferring VD as their pregnancy approached term. The partner's preference was a significant determinant for the women's choice. If a decrease in the proportion of women preferring ELCS is desired, the intervention programme should target the women and their partners who hold such a preference at 20 weeks.

Keywords Chinese, elective caesarean section, preference.

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Introduction

There is a trend to increasing caesarean section rates worldwide.[1–3] In Hong Kong, the caesarean section rate rose from 16.6 to 27.4% between 1987 and 1999.[1] Although the cause of the increase in caesarean section rate is multifactorial, the change in staff and women's attitude towards caesarean section is likely to be important.[4–6]

In recent years, because of an increasing emphasis on women's participation in their medical decision, women's demand for a caesarean section has become an important reason for the surgical route of delivery.[7,8] In a 2-year audit in a teaching hospital in Australia, maternal choice was the most common indication for elective caesarean section (ELCS).[9] In another audit of a teaching hospital in London, UK, 14% of the ELCSs were performed for maternal request alone, with no obstetric indications.[10] According to territory-wide obstetric audits in Hong Kong, ELCS performed for nonmedical indication increased from 6% of all ELCS in 1994 to 12% in 1999.[11,12]

Our previous survey showed that among nulliparous women attending their first antenatal visit in a public hospital in Hong Kong, 17% preferred ELCS for delivery.[13] This proportion is high compared with studies from other Asian countries: the corresponding figures were 3.7 and 5% in Singapore and South Korea, respectively.[14,15]

To date, there are no studies that address the issues of whether women's preference changes during the course of their pregnancy. The objective of this study was to examine a cohort of nulliparous Hong Kong Chinese pregnant women to see whether their preference for mode of delivery (MOD) changes as gestation advances. The association between sociodemographic, clinical and psychological variables and preference for ELCS were examined at the mid-trimester and at term, respectively. The information would be useful in order to design an antenatal intervention programme for women who demand for ELCS without an obstetric indication.

Methods

A longitudinal prospective observational study was conducted in a government-funded obstetric unit (public) and in a private obstetric practice group in Hong Kong during 2003 and 2004. The delivery rate during the study period was approximately 6000 per year at the government-funded institution and 1500 in the private obstetric practice. More than 98% of the parturients were ethnically Chinese. In Hong Kong, women have the freedom to choose and change anytime the hospital in which they want to be delivered. Obstetric service is free in public hospitals but is fee per service in the private hospitals. Approximately 25–30% of women deliver in private hospitals in Hong Kong. There are no planned home birth or community centres designated to conduct deliveries of low-risk pregnancies. Within public hospitals, ELCSs at a women's request are not performed without an obstetric indication. Within private practice, however, ELCSs on request remain an option provided that women were properly counselled.

Nulliparous Hong Kong Chinese pregnant women attending their routine fetal morphological ultrasound session at 18–22 weeks of gestation were invited to participate in the study by a single research nurse. Only women with singleton pregnancies who were eligible for a trial of vaginal delivery (VD) were invited to participate. Written consent was obtained, and the study protocol was approved by the institutional review board. Women who were known to have psychiatric diseases, medical disease, multiple pregnancies and pregnancies complicated with congenital abnormalities were excluded from the study.

The first interview was performed at 18–22 weeks of gestation (abbreviated hereafter as '20 weeks') after they had their routine fetal morphology ultrasound. This gestation was chosen for the first interview because we believed that women's anxiety at this gestational age should have reached a minimum as antenatal screening and diagnostic tests for fetal anomalies were completed. Furthermore, early pregnancy symptoms should have subsided at this gestation. Women who consented to the study were interviewed by one research nurse using a structured questionnaire. The women's sociodemographic details and obstetrical information were requested during their first interview. Women's preference for the MOD and the reasons for such preference were selected from a preset list. Women were also allowed to select the option 'other' and indicate their reasons if the preset list did not include her reason for such choice. They were then asked to complete three sets of self-report psychometric scales: the State-trait Anxiety Inventory (S-AI, T-AI), Multidimensional Health Locus of Control Scales (MHLC) and the Trust in Physician scales (TPS).

On completion of the first interview, women were given an appointment for a second interview at 35–37 weeks of gestation (abbreviated hereafter as '37 weeks'). This gestational age was selected as it was close to term and women should have gathered information to formulate a final opinion on the MOD. During the second interview, obstetrical complications were also recorded. Their preferred MOD and reasons for such preference were obtained again. Those with absolute indications for caesarean section at this point (only malpositions and placenta praevia in this study) were noted and excluded from the analysis. Women with relative contraindications to VD, in whom the final MOD was undecided (e.g. pre-eclampsia, previous myomectomy and large baby), were included. At the end of the interview, women were asked to complete a set of self-administered psychometric scales: S-AI, MHLC and TPS.

The antenatal care was not affected by their participation into the study. The information obtained from the questionnaires was blinded to the medical personnel involved in the clinical management of the women. The data on the obstetric outcomes were retrieved from the hospital's computer database or obtained directly from the women by phone if they were delivered outside the premise of the public institution responsible for this study.

Psychometric scales

The State-Trait Anxiety Inventory is the most widely used anxiety rating scales. It was developed to measure the present anxiety state as well as the enduring anxiety trait of an individual.[16] The 40-item self-report scale is divided into two 20-item sections: the first section evaluates the anxiety state (S-AI) and the second section assesses the anxiety trait (T-AI). Each item can be rated between 1 and 4, with a total score of 80 in each section. The Chinese version of the revised scale has been validated in Hong Kong Chinese populations, and the results showed good validity and reliability.[17] The mean and standard deviation for T-AI and S-AI score in Hong Kong Chinese pregnant women were 42.6 (SD 6.8) and 40.7 (SD 10.5).[18] In this study, both the T-AI and the S-AI were used in the first interview, but only the S-AI was used in the second interview (because the underlying anxiety trait should not have changed).

The MHLC scale is an 18-item questionnaire designed to assess people's belief as to whether their health is or is not

controlled by their own behavior.[19] The MHLC has been shown to have good validity and reliability.[19] Fear of loss of self-control in labour has been implicated as one of the reasons for women choosing ELCS.[20] The Chinese version of MHLC is available.[21] The scale assesses three dimensions of control namely; internal control by oneself (IHLC), control from powerful other (PHLC) and control by chance (CHLC). The maximum score for each dimension is 36. A previous study in Hong Kong showed that the mean scores were 20.6 (SD 4.7) for IHLC, 13.0 (SD 2.1) for PHLC and 20.5 (SD 5.4) for CHLC among postoperative Chinese obstetrics and gynaecology participants.[22]

TPS is an 11-item scale designed to measure patients' interpersonal trust in their physicians.[23] Women's trust in the physician is one important factor in making medical decisions, and this degree of trust may be affected by both cultural and social factors. A Chinese version of the TPS, which was recently validated by the Department of Psychiatry, The Chinese University of Hong Kong, was used in this project.

Statistical tests

Statistical analysis was performed by Statistical Package for Social Science version 10.1 (SPSS Inc, Chicago, IL, USA). Univariate analyses (chi-squared test/Fisher exact test for dichotomous variables and Mann–Whitney test for continuous variables) were used to identify obstetrical risk factors, sociodemographic factors and psychometric scores that were associated with a preference for ELCS. Potential explanatory variables were defined as variables found to have an association of $P \leq 0.2$ at univariate analyses.[24] These variables were entered into a logistic regression to assess the significance and degree of impact of the various obstetrical, sociodemographic factors and psychometric scores that were associated with preference for ELCS.

Results

Participants

A total of 600 women who satisfied the inclusion criteria were invited to participate into the study in 2003 and 2004. Five hundred and one women (84%) consented to the study. The distribution of the preferences for MOD at recruitment and subsequent follow up at 37 weeks is shown in Figure 1.

There were 61 women who did not attend the 37 weeks of follow up. Twenty of these women came from the public sector and 41 from the private sector. Univariate comparison of background sociodemographic information, clinical information and psychometric scores of these women showed that there were significant differences in their booking status—private versus public (OR 4.0, 95% CI 2.2–7.2), conception by *in vitro* fertilisation (OR 4.7, 95% CI 1.1–20.1) and S-AI score at 20 week (42.4 [SD 5.5] versus 44.6 [SD 5.4], $P < 0.01$). The distribution and delivery outcomes of this group are also shown in Figure 1. Ten women were delivered prior to the scheduled date of the second interview.

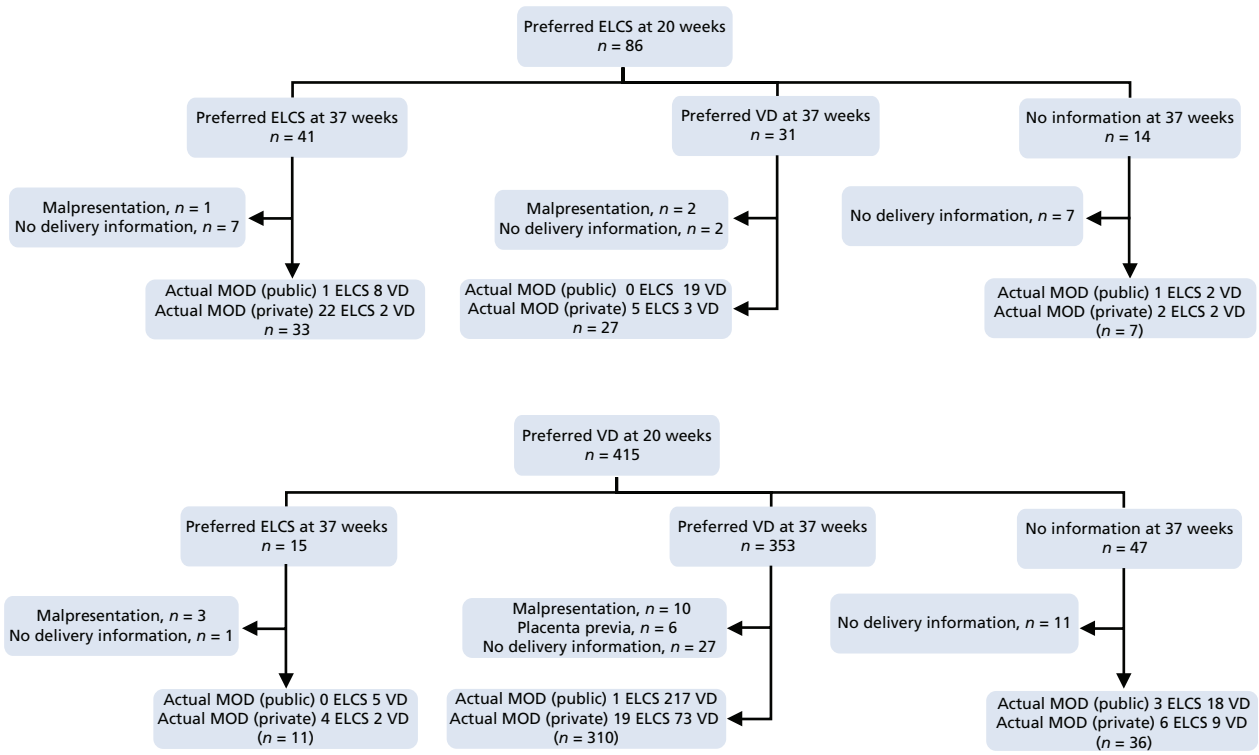

Figure 1. Distribution of preference for MOD throughout the study period.

Sociodemographic, clinical information and psychometric scores

The sociodemographic details, clinical details and mean psychometric scores of T-AI, S-AI, MHLC and TPS of women at 20 weeks are shown in Table 1.

Prevalence for preferring ELCS at 20 weeks and 37 weeks

For this cohort, the overall prevalence for preferring ELCS at 20 weeks was 17.2% (95% CI 13.9–20.5) and the overall prevalence for preferring ELCS at 37 weeks was 12.7% (95% CI 9.6–15.8). Women with obstetric indications for ELCS at the time of the second interview were then identified, as they were no longer candidates for VD. They included 22 women with either malpresentation (n = 16) or placenta praevia (n = 6), who were excluded from subsequent analyses for 37 weeks. After exclusion, the prevalence for preferring ELCS at 37 weeks was 12.4% (95% CI 9.2–15.6). Other women with obstetric complications by term were judged to have no contraindication for VD and were not excluded.

Table 2 shows the distribution of women's preference at 20 weeks and 37 weeks. Significantly more women who preferred ELCS at 20 week changed to VD at 37 weeks than vice versa (42.0 versus 3.7%, McNemar test P = 0.01).[25]

Table 1. Sociodemographic variables, clinical variables and psychometric scores of participating women

	Prefer ELCS at 20 weeks (n = 86)	Prefer VD at 20 weeks (n = 415)
Sociodemographic variables		
Booking status (public unit)	46 (54%)	253 (61%)
Age (years) (mean [SD])	30 (4.1)	29 (4.2)
Birth place (Hong Kong)	66 (77%)	324 (78%)
Educational level (≥ tertiary)	30 (35%)	162 (39%)
Employed*	58 (67%)	336 (81%)
Family monthly income ≥ US$6400	13 (15%)	62 (15%)
Women having religious belief	22 (26%)	112 (27%)
Clinical variables		
Previous surgery to uterus or cervix (excluding ERPC)*	7 (8.1%)	7 (1.7%)
History of uterine fibroid*	14 (16%)	26 (6.3%)
Present pregnancy		
Planned pregnancy	58 (67%)	315 (76%)
Partner's welcome pregnancy	84 (98%)	403 (97%)
Presence of infertility	12 (14%)	36 (8.7%)
Assisted conception	6 (7.0%)	13 (3.1%)
In vitro fertilisation	3 (3.5%)	5 (1.2%)
Threatened miscarriage	27 (31%)	125 (30%)
Partner preferring ELCS*	26 (30%)	12 (2.9%)
Psychometric score		
T-AI	41 (4.1)	42 (4.5)
S-AI**	43 (5.3)	45 (5.5)
TPS	30 (2.7)	30 (2.7)
MHLC	62 (8.4)	61 (9.1)
Internal subscore	25 (4.4)	25 (4.8)
Powerful others subscore	21 (4.1)	21 (4.3)
Chance subscore	16 (4.7)	15 (4.0)

ERPC, evacuation of retained product of conception.
Data are expressed in mean with SD or number with percentage.
*$P \leq 0.05$, chi-squared test.
**$P \leq 0.05$, Mann–Whitney test.

Determinants for preferring ELCS at 20 weeks (n = 501)

Univariate analyses of variables listed in Table 1 from all valid responders at 20 weeks were performed. Potential explanatory variables were maternal age in years (ELCS versus VD) (30.7 [SD 4.1] versus 29.5 [SD 4.2], P = 0.03), duration of attempt for conception in months (4.3 [SD 9.7] versus 7.7 [SD 52.3], P = 0.16), S-AI score (43.2 [SD 5.3] versus 44.6 [SD 5.5], P = 0.02), chance MHLC score (16.2 [SD 4.7] versus 15.4 [SD 4.0], P = 0.19), private participant (46.5 versus 38.8%, P = 0.18), being employed (67.4 versus 80.7%, P = 0.01), presence of uterine fibroid (19.4 versus 6.3%, P < 0.01), previous surgery to uterus and cervix (excluding surgical evacuation) (11.6 versus 2.4%, P < 0.01), presence of infertility (14.0 versus 8.7%, P = 0.13), planned pregnancy (67.4 versus 76.4%, P = 0.08), *in vitro* fertilisation (3.5 versus 1.2%, P = 0.12) and partner preference for ELCS (30.2 versus 2.9%, P < 0.01).

Logistic regression analysis was performed with the potential explanatory variables in univariate analyses. The variables that were found to have significant association (P < 0.05) with women's preference for ELCS at 20 weeks and their odds ratios are shown in Table 3.

Determinants for preferring ELCS at 37 weeks (n = 418)

Univariate analyses of variables listed in Table 1 from all valid responders at 37 weeks were performed. Potential explanatory variables were maternal age (ELCS versus VD) (31.3 [SD 3.8] versus 29.5 [SD 4.3], P < 0.01), powerful others MHLC score

Table 2. Changes of preference for MOD at 20 weeks and 37 weeks (n = 418)

	20 weeks		
	Preferred ELCS	**Preferred VD**	**Total**
37 weeks			
Preferred ELCS	40	12	52
Preferred VD	29	337	366
Total	69	349	418

42.0% changed from preferring ELCS to VD; 3.4% changed from VD to ELCS. McNemar test P-value = 0.01.

Table 3. Adjusted odds ratio of associated factors for preference for ELCS at 20 and 37 weeks of gestation using logistic regression (only significant variables shown)

Variable	OR (95% CI)
20 weeks of gestation	
Partner's preference for caesarean section	16.1 (7.2–35.8)
Previous uterine or cervix surgery	4.3 (1.1–17.8)
Planned pregnancy	2.0 (1.1–3.6)
S-AI score	1.1 (1.0–1.1)
Employed	0.4 (0.2–0.8)
37 weeks of gestation	
Partner's preference for ELCS	19.8 (9.5–41.0)

OR, odds ratio.

(21.9 [SD 4.1] versus 20.8 [SD 4.3], $P = 0.07$), private participant (16.3 versus 10.2%, $P = 0.07$), previous surgery to uterus and cervix (excluding surgical evacuation) (36.4 versus 11.8%, $P < 0.02$), *in vitro* fertilisation (53.1 versus 9.1%, $P = 0.06$) and partner preference for ELCS (53.1 versus 9.0%, $P < 0.01$).

Table 3 showed the results of logistic regression analysis performed with the potential explanatory variables for women preferring ELCS at 37 weeks.

Relationship of preference for ELCS and actual MOD

For the 418 women who attended the second interview at 37 weeks, delivery outcome information was available for 381. The overall odds ratio of women ($n = 381$) who preferred ELCS at 37 weeks being actually delivered by ELCS was 19.8 (95% CI 9.5–41.0).

Some women booked in the public unit were delivered in the private sector (not necessarily with the private group involved in the study) or vice versa. Among women booked in the public unit, 35 of 262 women were delivered in private hospitals. Twenty-five of 119 women booked in the private unit were delivered in public hospitals. In women booked at the public unit, significantly more women who preferred ELCS at 37 weeks changed to deliver in private hospitals than women who preferred VD at 37 weeks who finally delivered in private hospitals (12/26 [46.2%] versus 23/236 [9.7%], $\chi^2 = 26.8$, $P < 0.01$). There was no statistically significant difference in the corresponding figures for those women booked in the private centre who changed to deliver in public hospitals (1/25 [4%] versus 17/94 [18.1%], $\chi^2 = 3.1$, $P > 0.05$).

Reasons for choosing ELCS and VD at 37 week

The main reasons for choosing VD and ELCS at 37 weeks are shown in Table 4. Among women who changed from preferring ELCS at 20 weeks to VD at 37 weeks, the most commonly cited reasons were VD has quicker postdelivery recovery (33.3%), VD is the natural way of delivery (23.3%) and VD is safer for the baby (16.7%).

Discussion

This is the first report of a longitudinal study investigating the changes in preference for ELCS of pregnant women at the second and third trimester of their pregnancy. Significantly more women changed from ELCS to VD at term than from VD to ELCS (42.0 versus 3.4%).

Looking into the significant determinants for ELCS at 20 weeks, it appeared that women perceived ELCS as a solution for a safe and easy way of delivery. Some women also appear to have had misconceptions about the feasibility of VD after uterine and cervical surgery and so opted for ELCS at 20 weeks. As pregnancy advanced, however, they gathered more information about childbirth, so that by 37 weeks, they no longer saw this as important. The fact that the reasons for women who changed to prefer VD at 37 weeks were the same as those who preferred VD all along indicates that education during their antenatal period aligned their values. From the practical point of view, it seems to be beneficial not to make a decision for an ELCS too early in the mid-trimester. It would be appropriate to delay the final decision until the third trimester to allow time for women to consider all the information gathered during their antenatal period.

Table 4. Frequency distribution of the most important reason for preferring VD and ELCS at 37 weeks ($n = 418$)

	Proportion of women (%)
Women preferring VD ($n = 366$)	
VD has quicker postdelivery recovery	31
VD is the natural way of delivery	26
VD is safer for the baby	21
Experience of VD for the mother	8.2
VD is safer for the mother	7.4
Doctor's/midwife advice	3.8
VD has less overall pain	2.2
Others	0.3
Women preferring ELCS ($n = 52$)	
Caesarean section is safer for baby	44
Caesarean section has less overall pain	25
Fear of vaginal birth	7.7
Caesarean section allows a better control of time of birth	5.8
Doctor's/midwife advice	5.8
Caesarean section has less vaginal trauma	3.8
Convenience for sterilisation	3.8
Obstetric indications is the reason for ELCS	1.9
Other reason for choosing caesarean section	1.9

The partner's preference for MOD has been little studied. It has been well demonstrated that fathers of the pregnancy, just like their female counterparts, have anxiety over delivery.[26] Both the mother and the father have appraisals, coping strategies and support resources with adjustment to parenthood, although the mechanism might differ substantially.[27] A study on the psychosocial influence on women's experience of planned ELCS showed that partner's fear mediated between maternal fear and postoperative pain.[28] A randomised controlled trial showed that significantly more women initiated breastfeeding in the group whose partners attended an intervention class compared with those who attended a control class.[29] This finding is important as it gave us a clear message that we need to investigate the dynamics of partner's preference and women's preference for MOD and future interventional therapies should be designed to cater for both maternal and paternal issues.

We confirmed from our study that maternal preference for ELCS has a significant impact in the actual MOD. Since ELCS for nonclinical indications was not performed in public hospitals in Hong Kong, 46.2% women who preferred ELCS changed to deliver in private hospitals where they had more autonomy to decide their MOD. The corresponding figure for those who preferred VD was only 9.7%. Otherwise, the prevalence of women preferring ELCS at 20 weeks in the public and private patients was not significantly different after adjusting for other potential explanatory variables. It has been consistently shown that the effect of women's input in the decision to deliver by ELCS is significantly higher among private patients.[30,31] Part of these observations could be explained by treatment-seeking behaviour of women for MOD, which best suits their preference.

One of the limitations of the study is the number of women who did not attend the interview at 37 weeks (61/501). As a result, there might be an underreporting of variables, which affect women preference at 37 weeks because of selection bias. Also, because the subjects were recruited from only two units in Hong Kong, there is a limitation of its generalisability. Another limitation was that some women might change from preferring ELCS to VD by term because of the lack of such choice in reality in the public sector. Our research nurses have tried their best to inform the women that their wish in the survey was not related to the actual obstetric care. However, we acknowledged that the lack of choice in some women might have effect on their wish.

In conclusion, a significant proportion of women changed from preferring ELCS to VD towards term without specific intervention. However, a significant proportion of women who preferred ELCS at term changed from the public unit to the private hospitals where they had more autonomy on their choice. Partner's preference for ELCS was an important predictor for maternal preference for ELCS at term. Future studies should aim at understanding the reasons for partner's preference for ELCS. Also, if a decrease in the proportion of women preferring ELCS is desired, then an intervention programme should target the women and their partners who hold such a preference at 20 weeks. Although more than 40% of these women might change their preference anyway, it may be possible to improve on that and/or increase satisfaction with care.

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