

A Prospective Longitudinal Study of Postnatal Quality of Life among Hong Kong Women: Comparison between Normal Vaginal Delivery and Caesarean Section

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Objective: To compare the quality of life (QOL) in Hong Kong women who gave birth by normal vaginal delivery (NVD) and those delivered by Caesarean section (CS). Women were evaluated on discharge from hospital and 4 weeks after delivery.

Methods: This was a prospective longitudinal study conducted in the obstetrics unit of United Christian Hospital in Hong Kong from December 2009 to March 2010. A total of 75 women with NVD and 75 women with CS were recruited. QOL was measured by a generic questionnaire, Short Form 12 version 2 on discharge from hospital and at 4 weeks after delivery. The first questionnaire involved completion of a self-reported form, the second was completed by telephone interview. The data were analysed using Microsoft Excel and the IBM SPSS software.

Results: On discharge from hospital, 86% (129/150) of women returned a completed questionnaire. The mean scores of physical functioning ($p=0.01$), vitality ($p=0.003$), social functioning ($p=0.003$), bodily pain ($p=0.02$), mental health ($p=0.01$), as well as physical component summary ($p=0.01$) and mental component summary ($p=0.03$) scores were significantly higher in women who delivered by NVD than by CS. At 4 weeks after delivery, 75% (113/150) completed the questionnaire. There was a remarkable difference in general health ($p=0.01$), physical component summary measure ($p=0.003$), and social functioning ($p=0.05$) between NVD and CS groups.

Conclusion: Women who had a NVD enjoyed a generally better QOL than those who delivered by CS, both on discharge from hospital and 4 weeks after delivery. NVD is recommended for women without indications for CS. Hong Kong J Gynaecol Obstet Midwifery 2016; 16(1):86-92

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Introduction

A study in 2007 stated that 15% of births worldwide occurred by Caesarean section (CS). In developed countries, the proportion of CS has been reported to be 21.1%¹. In China, the CS rate soared drastically from 3.4% to 39.3% between 1988 and 2008². Some cases had no medical or obstetric indications of need for CS^{2,3}.

The rising trend remains controversial in developed countries. A higher CS rate has not resulted in additional health gain, on the contrary increased maternal and neonatal risk^{1,4}. Risk of ectopic pregnancy and placental problems is increased in future pregnancy⁵ and other studies have shown that CS is associated with a significantly increased risk for re-hospitalisation for uterine infection, obstetric surgical wound complications, and cardiopulmonary and thromboembolic conditions⁶. In the 2004-2008 World Health Organization Global Survey on Maternal and Perinatal Health, the incidence of severe maternal outcome associated with CS in the absence of medical indications was about 3 times greater than that associated with spontaneous vaginal delivery⁷.

Nonetheless CS is regarded as a modern obstetric practice by many mothers. It is safe in developed countries, it gives mothers a sense of control, and it preserves their dignity. Women also avoid the pain of labour⁸. Some women have also been reported to be afraid of postpartum urinary incontinence that is strongly associated with vaginal delivery^{9,10}. Nonetheless a recent local study showed that age, pre-pregnant body mass index, and a history of incontinence during pregnancy all contributed to stress incontinence, even after delivery by CS¹¹.

The available evidence about CS focused mainly on maternal physical health. More than half a century ago, the World Health Organization defined health as “a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity”¹². Over the past two decades, clinical researchers have broadened their

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definition of clinical outcome to include a concern for the patient's psychological and social wellbeing. The clinical significance or effectiveness of an intervention or treatment now often includes an evaluation of quality of life (QOL) that encompasses not only physical health, but mental and social health as well from the patient's perspective¹³.

A recent study in Iran concluded that normal vaginal delivery (NVD) may lead to a better QOL, and should be the preferred option for women with no medical indication for CS¹⁴. On the contrary, a UK study concluded that mode of delivery had no significant effect on QOL or the areas they identified as most important¹⁵. This current study aimed to examine this issue in the context of QOL to compensate for the paucity of such studies. We aimed to compare the QOL in Hong Kong women with NVD and CS on discharge from hospital and 4 weeks after delivery. A possible difference in QOL related to delivery by NVD or CS, if identified, may become a consideration when health care professionals counsel women on the mode of delivery or make a clinical judgement. This will enable women to make an informed choice.

Methods

This was a prospective longitudinal study of QOL following NVD and CS among Hong Kong women.

Sampling

The study was conducted in the obstetrics unit of United Christian Hospital in Hong Kong from December 2009 to March 2010. Based on the selection criteria, 75 women who underwent NVD and 75 who underwent CS were recruited. The inclusion criteria were age 18 to 40 years, married with a Hong Kong Identity Card, able to read Chinese, and gave birth by NVD or elective or emergency CS.

Women were excluded from analysis for the following reasons: instrumental delivery, child had congenital malformation or required admission to the neonatal intensive care unit, mother had a major psychiatric problem or medical condition that required regular treatment, marital status was divorced or widowed.

Ethical Considerations

Ethics approval was obtained from the Hospital Authority Research Ethics Committee (Kowloon Central / Kowloon East) prior to commencement of the study and women gave their written informed consent for voluntary participation. They had the right to withdraw from the study anytime with no adverse effect on treatment.

No patient identifier was recorded in the questionnaire or the background information sheet, and only a study code was used. All data were accessed by the researcher and used in this research only, and destroyed 1 month after the report was finished.

Data Collection

The researcher approached the women in the postnatal ward, a few days following birth. An information sheet was distributed and consent was sought at the same time. The first questionnaire (acute form) and the background information sheet (including age, number of children, education level, caregivers, and number of days being hospitalised) were distributed to the participants. Participants were expected to complete the questionnaire on a self-reported basis upon discharge from hospital, placing it in a collection box at the nurse's station. All postnatal ward staff were aware of the study objectives and methodology.

The second questionnaire (standard form) was completed by telephone interview 4 weeks after delivery. To prevent loss of contact, the most current telephone number was recorded during distribution of the first questionnaire.

Measurements

The main predictor variable was mode of delivery. The potential confounding variables included parity, obstetric history, economic status, employment status, and birth experience.

The QOL was measured by a generic questionnaire, Short Form 12 version 2 (SF-12v2) on discharge from hospital and 4 weeks after delivery. The SF-12v2 is a shorter version of the Short Form 36 version 2 (SF-36v2) Health Survey and uses 12 questions to measure physical and mental wellbeing from the patient's point of view. It takes only 2 to 3 minutes to complete and covers the same eight health scales as the SF-36v2. The eight scales are physical functioning, physical health, bodily pain, general health, vitality, mental health, emotional health, and social functioning. A shorter version may increase the return rate and minimise the missing data as postnatal mothers usually suffer from fatigue after delivery.

The SF-36 has been regarded as an indicator of QOL in many studies of pregnant or postnatal women^{16,17}, and has been proven to be highly feasible and reliable¹⁸. The SF-12 has been used for validation of another tool for measuring postnatal QOL^{15,19}.

Statistical Analysis

The hypothesis was that there is a difference in postnatal QOL between Hong Kong women delivered by NVD and those delivered by CS. In a similar previous study¹⁴, the differences between the two groups were significant for vitality and mental health at 6 to 8 weeks. For mental health, the standard deviation (SD) was 16.8 and difference in means between the two groups being 8.4. To set $\alpha=0.05$ and $\beta=(1-0.8)=0.2$, by the equation of unpaired t test, the sample size of each group should not be <63.

Data were entered into QualityMetric Health Outcomes Scoring Software 3.0. The score of each scale was calculated according to the author's recommendation, where 0 denotes the worst and 100 the best QOL. All scores above or below 50 were interpreted as above or below the general population norm, respectively. The aggregate scores for physical and mental summaries were computed according to the eight scales and presented as physical

component summary (PCS) and mental component summary (MCS) scores²⁰. The data were exported to Microsoft Excel and IBM SPSS Statistics version 18 for analysis.

Results

Of the 150 women recruited, 19 women withdrew and two returned questionnaires with missing data. These two questionnaires were excluded from data analysis. Of the 129 women left, 16 could not be contacted 4 weeks after delivery. Characteristics of the women are shown in Table 1.

Generally, the difference in demographics between NVD and CS groups was <10%, except for age-group and length of hospital stay. Of the 65 women with NVD, 23% were aged 18 to 25 years compared with 5% in the CS group. In the NVD group, 97% of women remained in hospital for ≤ 3 days compared with 59% of women in the CS group who spent 4 to 6 days in hospital and 31% who

Table 1. Characteristics of subjects

Characteristic	Normal vaginal delivery (n=65)	Caesarean section (n=64)	Total (n=129)
Age (years)			
18-25	15 (23%)	3 (5%)	18 (14%)
26-30	18 (28%)	20 (31%)	38 (29%)
31-35	20 (31%)	26 (41%)	46 (36%)
36-40	12 (18%)	15 (23%)	27 (21%)
No. of children			
1	38 (58%)	29 (45%)	67 (52%)
2	23 (35%)	26 (41%)	49 (38%)
3	3 (5%)	7 (11%)	10 (8%)
4	1 (2%)	2 (3%)	3 (2%)
Education level			
Primary	2 (3%)	0	2 (2%)
Secondary	44 (68%)	41 (64%)	85 (66%)
Tertiary	19 (29%)	23 (36%)	42 (33%)
No. of caregivers of the baby			
1	13 (20%)	11 (17%)	24 (19%)
2	45 (69%)	44 (69%)	89 (69%)
3	6 (9%)	9 (14%)	15 (12%)
4	1 (2%)	0	1 (1%)
Hospital stay (days)			
≤ 3	63 (97%)	6 (9%)	69 (54%)
4 to 6	2 (3%)	38 (59%)	40 (31%)
>6	0	20 (31%)	20 (16%)

stayed >6 days. The scores of the questionnaire completed by the two study groups on discharge from hospital and at 4 weeks after delivery were analysed by t test and are shown in Tables 2 and 3, respectively.

On discharge from hospital, the mean scores for physical functioning (p=0.01), vitality (p=0.003), and social functioning (p=0.003) were significantly higher in the NVD group; their mean scores for bodily pain (p=0.02) and mental health (p=0.01) were also higher, as expected. Both PCS (p=0.01) and MCS (p=0.03) scores were higher in NVD than in CS group (Table 2).

At 4 weeks after delivery, there was a remarkable difference in general health (p=0.01) and PCS score

(p=0.003) between NVD and CS groups. The score for social functioning was also higher in NVD group (p=0.05) [Table 3]. Comparison of scores between the groups are illustrated in Figure 1.

Discussion

Clinical Implications

Sherbourne et al²¹ emphasised that medical practice should strive to balance different health domains when making treatment decisions and thus improve mental and social health outcomes. The results of this study demonstrate that there is a difference in postnatal QOL in Hong Kong women delivered by NVD and those delivered by CS. On discharge from hospital, there were significant differences in physical functioning, vitality, and social functioning.

Table 2. Quality of life in women with normal vaginal delivery and Caesarean section, measured on discharge from hospital.

Health scale	Normal vaginal delivery (n=65)	Caesarean section (n=64)	Mean difference	p Value
Physical functioning	41.0 ± 10.4	36.0 ± 10.4	5.0	0.01
Physical health	41.5 ± 7.9	38.9 ± 8.3	2.6	0.07
Bodily pain	35.3 ± 9.9	31.1 ± 10.4	4.2	0.02
General health	47.2 ± 8.4	44.8 ± 9.1	2.4	0.12
Vitality	50.3 ± 7.5	45.9 ± 8.9	4.4	0.003
Social functioning	44.7 ± 11.0	38.6 ± 11.5	6.1	0.003
Emotional health	45.0 ± 8.6	43.1 ± 10.0	1.9	0.23
Mental health	52.8 ± 7.2	49.4 ± 7.9	3.4	0.01
Physical component summary	38.2 ± 8.4	34.3 ± 8.9	3.9	0.01
Mental component summary	52.4 ± 7.6	49.2 ± 9.6	3.2	0.03

* Data are shown as mean ± standard deviation, unless otherwise specified

Table 3. Quality of life in women with normal vaginal delivery and Caesarean section 4 weeks after delivery.

Health scale	Normal vaginal delivery (n=58)	Caesarean section (n=55)	Mean difference	p Value
Physical functioning	54.7 ± 4.2	52.7 ± 6.4	2.0	0.06
Physical health	52.5 ± 7.3	50.8 ± 8.0	1.7	0.24
Bodily pain	52.3 ± 7.9	49.8 ± 8.1	2.5	0.10
General health	48.0 ± 9.7	43.0 ± 10.0	5.0	0.01
Vitality	48.6 ± 12.3	50.3 ± 12.0	-1.7	0.46
Social functioning	53.4 ± 8.1	49.8 ± 11.0	3.6	0.05
Emotional health	50.3 ± 9.4	51.6 ± 8.0	-1.3	0.43
Mental health	54.8 ± 8.6	54.1 ± 7.9	0.7	0.68
Physical component summary	51.9 ± 5.3	48.4 ± 6.8	3.5	0.003
Mental component summary	51.5 ± 9.7	52.1 ± 8.2	-0.6	0.70

* Data are shown as mean ± standard deviation, unless otherwise specified

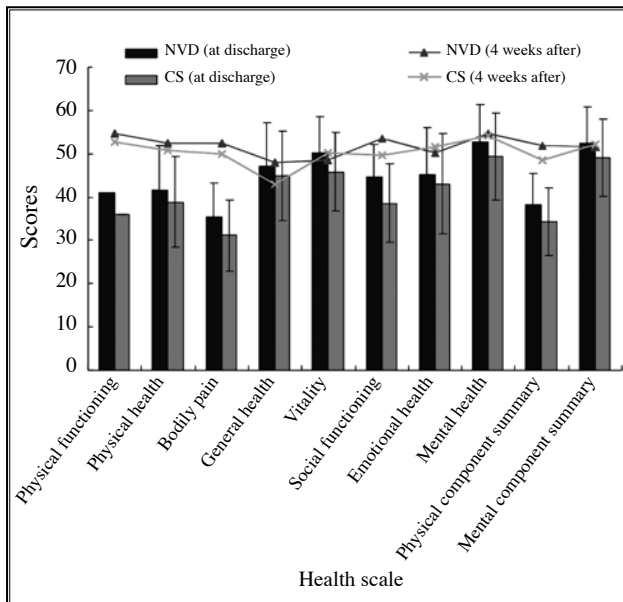


Figure 1. Comparison of mean scores of health scales and summary measures in women with normal vaginal delivery (NVD) and Caesarean section (CS) on discharge from hospital and 4 weeks after delivery

At 4 weeks after delivery, significant differences were also identified in general health and PCS measures. When health care professionals counsel women or make a clinical judgement, QOL should be a consideration.

Overall 97% women with NVD stayed ≤ 3 days in hospital. On the contrary, 59% women with CS stayed 4 to 6 days in hospital and 31% stayed for >6 days. The association between QOL and length of hospital stay was not investigated. Nonetheless a number of studies report that early discharge combined with home midwifery support benefits not only the mothers' health, but also significantly reduces the financial burden on the hospital without compromising the health and wellbeing of the mothers and babies²². In addition, level of maternal satisfaction is reported to be higher among women discharged early²³. Thus, NVD is suggested in view of the shorter length of stay.

A cross-sectional interview survey found that previous CS and conception by in-vitro fertilisation were determinants of a preference for elective CS in Hong Kong Chinese pregnant women²³. Nevertheless the recent literature shows a high success rate for vaginal delivery in women with one previous CS^{24,25}. The risks and benefits of different modes of delivery, as well as the associated QOL

should be illustrated clearly, especially for this group of women.

Apart from a health issue, the decision about mode of delivery is complex and also influenced by many other factors such as the socio-economic environment, personal financial status, cultural beliefs, peer pressure, personal values and attitude towards delivery². Women frequently seek medical advice from obstetricians or midwives when considering mode of delivery. It is surprising that a UK study reported 31% of female obstetricians in London requesting CS for their own pregnancy²⁶. A recent survey in 2008 also revealed that pregnant women were willing to accept higher risks of potential complications of vaginal delivery than their attending clinician²⁷. For the health and welfare of the women and the babies, clinicians should enable women to make an informed choice by providing them and their family with comprehensive and objective information.

Evaluation of the Study Design

The reliability and validity of this study tool, SF-12v2, were high. Its use has been proven by review in hundreds of published literature and various tests in different subjects²⁰. Nonetheless it is not designed for postnatal mothers in Hong Kong.

During the period of "doing the month", a traditional Chinese custom of 1-month confinement after delivery, Chinese postnatal women are encouraged to rest at home and discouraged from performing any physical activities²⁸. For example, climbing stairs may be avoided and household chores taken over by relatives. Some may not even care for their baby. Thus the three questions "Does your health now limit you in these activities: Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or doing tai chi?" (question 2); "...such as climbing several flights of stairs?" (question 3); and "How much of the time have you had any of the following problems with your work or other regular daily activities?" (question 4) may not reflect the real physical fitness of the mothers in our study who may have been completely inactive for 4 weeks.

In addition, the questionnaires did not include issues that some women may consider important, such as the relationship with their husband and family members, sexual health, or feelings towards their baby. A pilot study¹⁹ that assessed postnatal QOL by Mother-Generated Index revealed that sense of fulfilment, self-esteem, family relationship, happiness with the baby, and personal time were all regarded as important factors in postnatal QOL.

Recruitment of the Sample and Data Collection

As expected, an increasing trend for cross-border marriage, and an increasing number of new immigrants from mainland China²⁹ results in the return of many women to China for “doing the month”, even if they hold a Hong Kong Identity Card. Within this cohort, around 10% women were uncontactable after 4 weeks. This problem may have been overcome by excluding women during the recruitment stage if they planned to return to China, or allowing the questionnaire to be returned in a prepaid addressed envelope.

Potential Confounding Variables

Interaction between the length of hospital stay and QOL was unclear. Daily activities and family visits may have been interrupted by hospital policy and ward routine during hospitalisation. For instance, resting time might be interrupted by meal times, doctor’s rounds or nursing duties. Family support and meeting may have been limited by standard visiting hours. A study that compared women with early and traditional discharge following a minimum of 48 hours’ hospital stay showed that the level of maternal satisfaction with early discharge was higher than 90%³⁰. Thus, the length of stay could be a confounder to the scores.

Of the 65 women with NVD, 23% were aged 18 to 25 years, compared with 5% in the CS group. Figure 2 shows that the mean PCS and MCS scores on discharge from hospital, as well as the PCS score at 4 weeks after delivery were highest in the youngest age-group. The result was consistent with a younger age and presumed better physical fitness.

Improvement and Extension of the Research

Söderquist et al³¹ assessed the risk factors for post-traumatic stress and depression in 1224 women at 12 to 20 weeks and 32 weeks of gestation and 1 month after delivery, and revealed that specific risk factors could be identified in early pregnancy. In this research, only postnatal health scales were assessed. In future studies, questionnaires completed before delivery as a baseline would allow evaluation of a pre- and post-delivery difference for individuals. Whether postnatal QOL is affected by some pre-existing risk factors and not just mode of delivery warrants further exploration.

In this study, the difference in QOL score between women who underwent an elective or emergency CS was not evaluated. A previous study in 2005³² showed

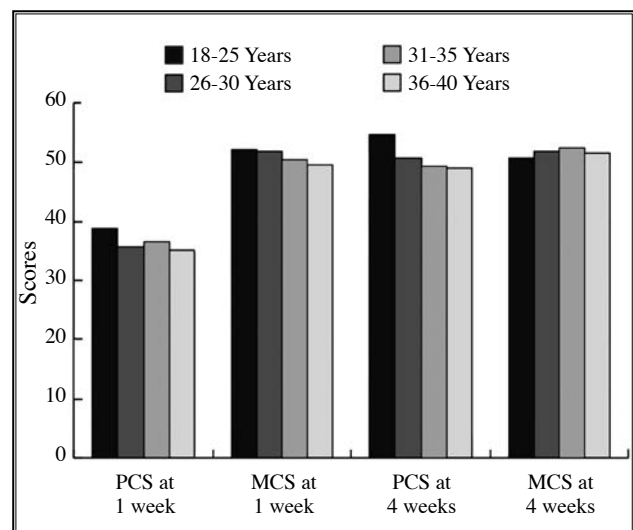


Figure 2. Comparison of mean physical component summary (PCS) and mental component summary (MCS) scores among different age-groups

that emergency CS did not increase the risk of postnatal depression compared with elective CS, whereas another study in 2006³³ indicated that emergency CS was associated with post-traumatic stress disorder. Further study on this aspect is worthwhile.

Success with breastfeeding has also been found to be significantly related to the QOL of postnatal mothers in a previous study in Brazil³⁴. Thus mode of feeding may be included in future studies.

Conclusion

This study shows that women who underwent a NVD had a better QOL than those who required delivery by CS, both on discharge from hospital and at 4 weeks after delivery. Thus, NVD is recommended for women in whom CS is not medically indicated.

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