Research article

Evidence-based obstetrics in four hospitals in China: An observational study to explore clinical practice, women's preferences and provider's views

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Abstract

Background: Evidence-based obstetric care is widely promoted in developing countries, but the success of implementation is not known. Using selected childbirth care procedures in four hospitals in Shanghai, we compared practice against evidence-based information, and explored user and provider views about each procedure.

Methods: Observational study. Using the Cochrane Library, we identified six procedures that should be avoided as routine and two that should be encouraged. Procedure rate determined by exit interviews with women, verified using hospital notes. Views of women and providers explored with in depth interviews.

The study sites were three hospitals in Shanghai and one in neighbouring province of Jiangsu. 150 women at each centre for procedure rate, and 48 in-depth interviews with women and providers.

Results: Vaginal births were 50% (303/599) of the total. Of the six practices where evidence suggests they should be avoided as routine, three were performed with rates above 70%: pubic shaving (3 hospitals), rectal examination (3 hospitals), and episiotomy (3 hospitals). Most women delivered lying down, pain relief was rarely given, and only in the urban district hospital did women routinely have a companion. Most women wanted support or companionship during labour and to be given pain relief; but current practice is insufficient to meet women's needs.

Conclusion: Obstetric practice is not following best available evidence in the hospitals studied. There is a need to adjust hospital policy to support the use of interventions proven to be of benefit to women during childbirth, and develop approaches that ensure clinical practice changes.

Background

In China, over 60% of women deliver in health facilities. Even in rural areas, institutional births account for over half the births in some provinces, with a national urban average of 76%. Shanghai has the highest rate of institutional deliveries, with virtually all women delivering in hospital [1]. Over the last few years there have been efforts to improve the quality of care in hospitals throughout China. Some tertiary hospitals in Shanghai have been promoting evidence-based care [2, 3]. The World Health

Organization (WHO) and UNICEF have promoted baby friendly hospitals. However, mechanisms to encourage evidence-based obstetric care that is humane and women-friendly have not been discussed widely in the country.

The WHO is promoting evidence-based obstetrics. WHO publish the Reproductive Health Library, a free annual electronic publication, consisting of systematic reviews relevant to obstetric care in poorer countries [4]. The WHO also classifies practices in normal birth according to evidence [5]. With colleagues in Chile, we have suggested that one step towards evidence-based practice is to document actual practice. We can then use this information to compare against reliable research summaries and explore with providers possibilities for change and ways to introduce more evidence-based practice [6].

Many controlled trials internationally have investigated ways to change provider behaviour. Most have been developed on the premise that increasing knowledge will lead to change and improved practice. However, change is more likely if the needs of providers, consumers and communities are addressed [7]. The methods used in this study aim to explore the barriers and opportunities for change in the hospital setting. In a collaboration between providers and researchers in Shanghai, a process was established to make obstetric care more evidence-based and humane. This paper describes practice for common procedures where reasonable research evidence summarising benefits and harms exists in four hospitals. We were particularly concerned about procedures with important implications for the woman, by influencing her experience of childbirth; or for the service, by influencing resources or expertise required.

Methods

Study sites

All government hospitals in China follow practical guidelines from the Ministry of Health, and hospital leaders are responsible for implementation. For institutional deliveries doctors make decisions for childbirth interventions. Midwives assist during birth, but the doctor always takes medical decisions. The 'one-child policy' is still advocated nationally and the majority of women delivering in hospital are primigravidae.

We selected three hospitals in Shanghai, and one in Sihong, in the neighbouring province of Jiangsu. The urban units were purposively selected as they provide the training base for medical students from the School of Public Health (Fudan University), and they are hospitals where we had a good working relationship. The rural hospital was chosen as a comparison. We judged any deficiencies at these hospitals were likely to occur elsewhere, and that these were centres where change in practice could be initiated. The four hospitals were a specialist (university-affiliated) hospital (average 200 deliveries per month), a city level Maternal and Child Health (MCH) hospital (average 320 deliveries per month), an urban district MCH hospital (average 80 deliveries per month) and a rural county hospital (average 150 deliveries per month).

Data collection

Exit interviews

We used a structured interview with postpartum women to document practices used during childbirth, and their views about companionship or support during labour and the childbirth environment. We selected procedures for which evidence of benefits and harms had been summarised, and where the procedures were likely to impact on obstetric outcomes or the women's perception of care. As these procedures are likely to be common or uncommon, 150 postpartum women per hospital, who were healthy and with no complications, were interviewed consecutively from April - May 1999. Trained senior medical students visited the hospitals each day over the study period to interview women due for discharge that day. Procedures reported by women were verified using hospital notes. Data from exit interviews were processed and analysed using *Epi Info*.

In depth interviews

We explored women's views using a semi-structured interview. Women were asked about the care they received in hospital, their opinions on social support, their impressions of the hospital environment, any suggestions for improvements, and what the hospital should do to promote 'women-friendly' care. We interviewed 6 postpartum women from the previous exit interview sample who were willing to be interviewed in depth at each hospital. The number who refused further interview was not recorded, but for those who refused it was an inconvenient time - they were breastfeeding the baby, being examined by a doctor, or were being visited by relatives.

We used semi-structured interviews to explore provider's views about Caesarean section rates, interventions during childbirth, social support, constraints to good practice, and opportunities to change. We interviewed 6 providers at each hospital, three doctors (including the doctor in charge) and three midwives (including the sister in charge).

Researchers from the MCH department of the School of Public Health, Fudan University, conducted all in-depth interviews. Each interview lasted 45 to 60 minutes, followed an open-ended interview guideline and was tape-recorded. In-depth interviews with women and provid-

ers were analysed manually. Transcripts from each of the study sites were analysed using methods of content analysis and common themes documented by study site. For the purpose of this report, the qualitative findings were interpreted and transcribed into English by the principal investigator and the research team.

Ethical approval

The study was permitted by the scientific research office in the School of Public Health, Fudan University, heads of the study hospitals, and directors of Obstetric and Gynaecology departments at the study sites. Participation was voluntary and respondents agreed to the recording process. Respondent's names were not recorded, and confidentiality was upheld.

Results

Participants characteristics

Table 1 describes the demographic characteristics of the 599 women interviewed. The majority of women were primigravidae, as expected in China. Most of the women from Shanghai had attained senior high school or technical secondary school, but rural women in Jiangsu had below junior high school education. Women at the county hospital were more likely to pay fees themselves, with lower rates in the other hospitals, where women were mostly covered by Government, labour and medical insurance schemes.

Table 1: Socio-demographic characteristics of participants by study site

Characteristics	Specialist	City MCH	District	County
N	**150**	**150**	**150**	**149**
Mean age ± SD	28.2 ± 4.6	27.7 ± 3.6	28.5 ± 4.9	24.5 ± 2.7
Range	(19-42)	(20-40)	(19-31)	(19-36)
High school education (%)	119 (79)	130 (87)	116 (77)	40 (27)
First delivery (%)	132 (88)	143 (95)	139 (93)	139 (93)
Self payment (%)	59 (39)	39 (26)	77 (51)	122 (82)

Current practice

Caesarean section

Table 2 shows that half the deliveries were by Caesarean section. The total Caesarean section rate was highest at the district hospital (73%, 95% CI 65 to 80), and lowest at the county hospital (30%, 95% CI 22 to 37). Across all hospitals, 235 /296 of the decisions for Caesarean sections were made by doctors, mainly for fetal distress (65 women) and abnormal position (46 women).

Procedures during vaginal delivery

Table 3 shows procedures used during vaginal delivery at each hospital, with wide variation in provider practice between hospitals. Some procedures, where best available evidence suggests they should be avoided, were routine practice, with rates above 90%: pubic shaving (3 hospitals), rectal examination (3 hospitals), and supine position (4 hospitals). Episiotomy was routine with rates above 85% in 3 hospitals.

Pain relief was provided for less than 27% of women at all four hospitals. Acupuncture, epidural analgesia, abdominal massage, diazepam and pethidine are the most commonly used methods of pain relief. Over half of the women (157/303) said they could not tolerate labour pain, and 34% (103/303) said they could not sleep because of the pain. All but one of the 303 women delivering vaginally wanted a companion during labour, but only 27% was this the case, mostly in the urban district hospital.

Women's views

Type of delivery

Women who favour Caesarean section do so for a number of reasons - both physiological and cultural. 7/24 women inherited fear of vaginal birth from friends who relayed stories of severe pain; for instance one woman said, "my friend told me that vaginal delivery is really painful. I fear pain a lot and don't want to experience it. So I requested to have a Caesarean section."

Table 2: Type of delivery by study site

Type of delivery	Specialist	City MCH	District	County	Total
N	**150**	**150**	**150**	**149**	**599**
Spontaneous vaginal (%)	60 (40)	71 (47)	41 (27)	99 (66)	271 (45)
Vacuum/forceps (%)	15 (10)	11 (7)	0 (0)	6 (4)	32 (5)
Elective CS (%)	41 (27)	36 (24)	87 (58)	28 (19)	192 (32)
Emergency CS (%)	34 (23)	32 (21)	22 (15)	16 (11)	104 (17)

Table 3: Actual practice in four hospitals in China. Procedures are categorised into "avoid as routine" or "encourage as routine" through reference to research evidence from Cochrane Systematic Reviews

	Specialist	City MCH	District	County	Total
Vaginal deliveries (women)	**75**	**82**	**41**	**105**	**303**
Avoid as routine					
Pubic shaving (%)	0 (0)	82 (100)	39 (95)	98 (93)	219 (72)
Enemas	1 (1)	1 (1)	22 (54)	0 (0)	24 (8)
Rectal examination	71 (95)	0 (0)	39 (95)	103 (98)	213 (70)
Supine position	75 (100)	82 (100)	41 (100)	102 (97)	300 (99)
Electronic FHR monitoring	75 (100)	76 (93)	37 (90)	1 (1)	189 (62)
Episiotomy	70 (93)	74 (90)	36 (88)	68 (65)	248 (82)
Encourage as routine					
Mobility during labour	27 (36)	19 (23)	23 (56)	8 (8)	77 (25)
Companionship during labour	6 (8)	30 (36)	38 (93)	8 (8)	82 (27)

Caesarean delivery was also preferred for reasons strongly linked to traditional Chinese culture. For example, one woman explained that Caesarean delivery could allow one to choose a good day of childbirth according to the Chinese calendar.

Traditional beliefs also influenced a preference for avoiding CS. 3/24 women mentioned that the operation will damage their 'yuan qi' or vigour making them lose energy. One woman commented, "anyway, CS is an operation, it may damage my 'yuan qi'. It is also more expensive than vaginal delivery, I feel it is hard to afford it." Other women, who initially feared vaginal delivery, explained that when encouraged by providers, they found confidence to try normal birth - as one woman explained, "I would have liked to have had a Caesarean section because I am afraid of pain. But when I got to the hospital, one old doctor volunteered to be a companion, and to stay with me and encourage me to try a vaginal delivery. Her words with experience made me feel more confident. So I tried and finally had a successful vaginal delivery."

Pain relief

12 out of 13 vaginal delivery women described their experience of labour pain as intolerable, and that they had never experienced pain like it before. A typical comment was, "it was very painful and really intolerable, I don't want to have another baby again. I hope someday we can have delivery in no pain." Some women (10 out of 13 vaginal deliveries) said they wanted to deliver with control of pain, but they feared that drugs might affect the baby. Others were more prepared to accept labour pain. For example, one said, "Childbirth is a natural event and also is a mother's responsibility. I would like to follow the natural process; I've prepared to experience any feelings. I don't need any pain relief because it may cause adverse effect on my baby."

Social support during childbirth

16 out of 24 women interviewed agreed with the concept of social support during childbirth. Support of family members was regarded as helpful in different ways to that of lay companionship. Women commented that family members help with daily needs, are able to seek assistance from staff, and offer comfort and support. One commented, "I would like my husband with me in the labour room. He can share my pain and hold my hands. I can feel support and dependable. My husband can understand that childbirth is not easy for his wife." Companionship offered by a lay person was also described as beneficial - not so much for comfort and support, but to communicate instructions to women.

Other women did not favour companionship during labour; and some disagreed particularly with the presence of partners during childbirth. One woman expressed strongly her feelings about the presence of her husband: "If no one accompanies me, I will feel more strong to face the situation. I don't want my husband to see me crying and bleeding during childbirth. He will be very nervous and even shocked."

Provider views

Caesarean section rate

During in-depth interviews, providers discussed ways to reduce the Caesarean rate, one doctor suggested, "If the hospital has a clear policy for CS, we will feel more confident to say no to those clients asking for CS without any

medical indicators." Reducing the incidence of 'macrosomia' or the number of babies over 4 kg in weight was another suggestion.

A few (3/24) providers believe CS is a safer option than vaginal delivery especially with the improvements in operation techniques. They feel more confident using CS since there is a lower risk of complications arising.

Pain relief

There were few comments about the use of pain relief during labour, but one midwife described the association between pain relief and further intervention during labour, "Pain relief should be provided to women with severe pain. If women in labour cry hard, the delivery process will become more difficult because they will loose energy and also don't have good co-operation with midwives, then they ask for a CS."

Provider's view on a restrictive policy for episiotomy

Providers generally believed that routine episiotomy is required for primigravidae, although appeared open during interview for restrictive policy. One doctor stated, "Episiotomy means women have a cut and need to be stitched, and this increases the chance of infection. If midwives can improve their birth attending techniques, it is possible to change the routine policy to more restrictive use." The commonest perceived benefits of a restrictive policy for episiotomy were a reduction in maternal infection during delivery, reduced length of hospital stay, decreased cost of delivery, and less psychological distress for the woman. In addition, providers suggested that a more restricted policy could promote early initiation of breast feeling since women will be more able to adopt a sitting position. Providers identified several problems associated with a restricted episiotomy policy, including increased incidence of tearing, increased fetal distress and more frequent postpartum vaginal bulging and stretching. One doctor commented on the resulting pressure on providers to take more responsibility during the childbirth process: "Most Chinese women are primiparous. Restricted episiotomy can make women at more risk of tears, and providers must take more medical responsibility."

Social support during childbirth

All providers agree social support is good practice but commented on associated adverse effects. Companionship offered by a family member was considered beneficial in terms of psychological support, and helping with the woman's daily routine. Conversely, providers feared that women may be less co-operative, that conflict between provider and the woman may arise, and that companions may intervene in the delivery process.

Providers suggested support offered by a lay person could be more beneficial than a family member. Comments seemed to suggest that most lay companions are retired midwives, and therefore are able to assist providers in observing the childbirth process, finding problems, and encouraging normal vaginal delivery. However, providers cited the risk of cross infection, supporters intervening with medical procedures, and the fear that midwives would take less responsibility as problems associated with lay companionship.

Providers indicated there were a number of problems with considering a policy of social support: it is difficult to find suitable lay persons to give support, and many maternity units lack the necessary privacy to allow companions to be present. Only one single delivery room is available at the specialist hospital to allow both lay and family companionship upon request. Lay companions are provided in both the labour and delivery room on request at the city MCH hospital but there are no single delivery rooms (which are often requested by foreign women in Shanghai). The district hospital allows family members to be present in the labour room but no lay companion service. Neither lay nor family companionship is permitted at the county hospital. The district and county hospitals do not currently have any single delivery rooms.

Discussion

Limitations of the study

Only 4 hospitals were selected as our study sites. They represent four different types of provider, but the findings cannot be extrapolated to hospitals in other provinces. We selected women for exit interviews at only one time point in the year, and did not sample across months.

For the in-depth interviews, providers were selected purposefully, seeking the key members of staff who were more able to comment on current practice and discuss opportunities for change in their hospitals. However, some participants lacked knowledge of the most up to date evidence, and this affected their understanding of the changes needed.

Current practice

Routine obstetric practice varied between hospitals, and some unnecessary and uncomfortable procedures were common, even though systematic review findings do not provide evidence of benefit. For example, routine practice (more than 70% of vaginal births) included supine delivery (4 hospitals), rectal examination to monitor labour (3 hospitals), pubic shaving (3 hospitals), and episiotomy (3 hospitals). Interventions for which practice is inconsistent across the study sites include enemas, rectal

examination, electronic FHR monitoring, and companionship during labour.

Companionship during childbirth has been initiated in the study hospitals, but it is presently insufficient to meet women's need. Findings from clinical studies in Shanghai [2,3] and systematic review evidence [8] show the clear benefits of social support during childbirth. The main barriers to implementing social support at the hospitals we studied were the labour wards were too small to accommodate them, and the family members had less basic knowledge about childbirth so the providers prevented them attending.

Pain relief was not usually given, although most women were primigravidae, and pain was a common complaint from the in-depth interviews. This is consistent with work by Zhu [9]. The Caesarean section rate was high at three of the facilities, and the qualitative results suggested that inadequate pain relief might contribute to women preferring Caesarean section to relieve or avoid pain.

The Caesarean section rate at our study sites is consistent with Huang's report in China [10]. Indications for Caesarean section (when it was the doctor's decision) were largely medical; 22% women out of our total Caesarean section cases were diagnosed with fetal distress, which is higher than Zhao's report (14.8%) in China [11]. However, the diagnosis of fetal distress by continuous FHR monitoring alone may be not accurate enough [12]. Other reasons for CS delivery mentioned frequently by providers in our in-depth interview were precious and over weight babies and a few commented that they had more confidence in using CS as there is a lower risk of complications. Further work will help elucidate the influences on the high Caesarean section rate, and this study has highlighted the need to examine whether inadequate pain relief is an important contributing factor to women's preferences.

Implications for policy

Despite the considerable barriers that must be overcome in order to implement evidence in practice, some hospitals are already moving towards more 'women-friendly' obstetric care through a process of incremental change and modifications to hospital guidelines. One of the study hospitals has initiated a continuous antenatal to delivery service with one fixed group of providers. Shaving and rectal examinations have been eliminated in two hospitals respectively. Episiotomy is being used selectively in the rural hospital, and the use of enemas has been reduced in three of the four study sites. Social support has been encouraged at all study sites, and private delivery rooms are being offered in the specialist hospital. These hospitals represent good examples of how evidence-based practice can be implemented.

On the basis of this study, the Women's Health Care Association of China has conducted an operational study on protecting, promoting and supporting normal birth to encourage evidence-based obstetric care in 13 MCH hospitals nationally (FL Wang, personal communication, 2000).

Internationally, this study highlights the importance of exploring variations in practice against evidence-based approaches and women's needs, to improve quality of care.

Other information

This study was part of the Better Births Initiative, arising out of collaborative work between China, South Africa [13], Zimbabwe [14] and the UK. The rationale for the Better Births Initiative is that if providers change their current practice in relation to a few common obstetric procedures, care would become more evidence-based, less degrading and more comfortable. These changes could happen today at no cost, and would improve service quality, obstetric outcomes, and women's experience of childbirth. For further information, see [http://www.liv.ac.uk/lstm/bbimainpage.html].

Contributors

XQ formulated the study objectives, was responsible for all phases of the study and wrote the paper. HS contributed to data analysis, interpretation and writing. LZ supervised data collection, analysis and results presentation. JL conducted the statistical analysis. PG developed the initial study design, provided technical support and helped write the paper.

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Competing interests: none declared

References

1. MCH Department of Beijing Medical University : **Report on analysis of maternal and child health routine collection data in 1997.** *Beijing, Beijing Medical University* 1998,
2. Shi LX, Shao YL, Jiang WM, Cheng HJ, Pan JF: **Clinical study on 'doula' delivery.** *Chinese Journal of maternal and Child Health Care* 1997, **12(4)**:229-230
3. Wang DF, Mao XF, Qian SP, Chen RJ, Hua JZ: **Clinical study on delivery with 'doula' companionship.** *Proceedings from the first 'safe motherhood' programme meeting. Ministry of Health, MCH Division, with*

the Chinese Medical Association and the Chinese Preventive Medical Association, Shan Tou, May 1998

4. World Health Organization : **The WHO Reproductive Health Library No3.** *Geneva, World Health Organization* 2000,
5. Department of Reproductive Health and Research : **Care in normal birth: a practical guide.** *Geneva, World Health Organization* 1999,
6. Garner P, Kale R, Dickson R, Dans T, Salinas R: **Implementing research findings in developing countries.** *British Medical Journal* 1998, **317**:531-53
7. Brugha R, Zwi A: **Improving the quality of private sector delivery of public sector health services: challenges and strategies.** *Health Policy and Planning* 1998, **13(2)**:107-120
8. Hodnett ED: **Caregiver support for women during childbirth (Cochrane Review).** *In: The Cochrane Library, Issue 1, 2001. Oxford, Update Software.*
9. Zhu LP, Zhou PH, Hua JZ, Qin ZY: **Current status of application of obstetric service techniques in Shanghai.** *Chinese Journal of Maternal and Child Health Care* 1999, **14(9)**:589-
10. Huang XH: **Current status and expectation of Caesarean sections.** *Proceedings from the first 'safe motherhood' programme meeting. Shan Tou, Ministry of Health, MCH Division, with the Chinese Medical Association and the Chinese Preventive Medical Association, May 1998*
11. Zhao GL, Wang LH, Bai M, Chen LJ, Qu CY: **Study on factors affecting mode of delivery.** *Proceedings from the first 'safe motherhood' programme meeting. Ministry of Health, MCH Division, with the Chinese Medical Association and the Chinese Preventive Medical Association, Shan Tou, May 1998*
12. Notzon FC, Cnattingius S, Bergsjø P, Cole S, Taffel S, Irgens L, Kjersti Daltveit A: **Cesarean section delivery in the 1980s: International comparison by indication.** *Am J Obstet Gynecol* 1994, **170 (2)**:495-504
13. Hofmeyr J, Brown H, Nikodem C, Garner P: **Childbirth companionship implementation: a randomised trial [abstract].** *Proceedings of the 7th World International Association for Maternal and Neonatal Health conference, Cape Town, South Africa* 2000,
14. Mahomed K, Smith H, Garner P, Dangaiso E, Huni N: **Quality of childbirth care in a government hospital in Harare, Zimbabwe [abstract].** *Proceedings of the 7th World International Association for Maternal and Neonatal Health conference, Cape Town, South Africa* 2000,

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