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A mixed-method study of factors associated with differences in caesarean section rates at community level: The case of rural China [☆]



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ABSTRACT

Objective: to assess population-based caesarean section (CS) rates in rural China and explore determinants and reasons for choosing a CS.

Design: cross-sectional study, quantitative and qualitative methods, statistical modelling.

Setting: two rural counties in Anhui province, China.

Participants: (a) household survey participants: 2326 women who gave birth in the two counties from January 2005 to December 2006; (b) qualitative study participants: health providers at township and village level and maternal health-care providers ($N=58$).

Measurements and findings: the household survey were conducted among 2326 women, collecting data on socio-economic and health status and utilisation of maternal health services. Eleven Focus Group Discussions with health-care providers and users to explore perceptions surrounding CS.

the CS rate in the two areas were 46.0% and 64.7%. There were complex and different interactions among social-economic and clinical determinants associated with differences in CS rates. The main determinants that emerged were maternal age, maternal education, yearly income, primiparity, uptake of antenatal care and recorded obstetric complications with complex and differing interactions for each county. Maternal fear of pain, worry about mothers' and infants' safety, not satisfied with doctors' competences and physicians' low confidence in vaginal delivery, and absence of a strong midwifery cadre together contributed to final determination of CS.

Key conclusions: the CS rates were extremely high in the two counties in rural China. Maternal socio-economic, clinic characteristics and health providers' preference contributed together to the high rates of CS.

Implications for practice: evidence-based knowledge and methods to reduce unnecessary CS should be communicated to medical professionals and women. Greater comprehensive attention needs to be paid to a complex pattern of medical, socio-cultural, political and economic contexts of maternity care.

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[☆] Ethical approval was obtained from the Research Ethics Committee at the Liverpool School of Tropical Medicine in UK (Approval No. 06:42) and from Biomedicine Ethical Committee in Anhui Medical University (Approval No. 2007002). Agreement to carry out the study was also sought from the local health bureaus. Informed consent was obtained from all participants participating in interviews and group discussions after the purpose of the study and specific activity was explained. Participants' names in interviews and group discussions were not recorded to further protect privacy and confidentiality.

Introduction

Caesarean section (CS) is needed to prevent or treat life-threatening maternal or fetal complications in an estimated 5–15% of pregnancies (WHO, 2009). Globally there are great discrepancies in the availability and use of CS with inability to meet these minimum coverage levels in many low to middle income countries and increasing concern about rising CS rates in other areas. This was recently highlighted in surveys from Asia and Latin America (Langer and Villar, 2002; Villar et al., 2006; Lumbiganon et al., 2010). Of 60 medium and high income

countries, the majority (62%) had national rates of caesarean section above 15% (Althabe et al., 2006). For Asia the overall CS rate was estimated to be 27.3% with the highest estimate for China at 46.2% (Lumbiganon et al., 2010). In China, the highest increases were found in rural areas, where one in three women delivered by caesarean section compared with 13% in 2003 (Meng et al., 2012).

Increasing CS rates do not necessarily lead to improved outcomes and may be associated with increased risk of maternal mortality, hysterectomy, haemorrhage, infection, ureteral tract injury, neonatal respiratory morbidity, and placenta praevia and uterine rupture in future pregnancies (Villar et al., 2006, 2007). In addition increasing CS rates can be considered a resource drain especially where resources are scarce.

Historically, most deliveries by CS occurred in cases with the highest levels of evidence, such as placenta praevia or breech presentation, or because of identified obstetric or fetal complications. However, rates of elective CS with no absolute medical or obstetric indication have risen. Many factors have influenced this change in practice both from health users' and providers' sides. These include increasing consumer awareness and expectation, fear of intrauterine death, brain injury and pelvic floor damage associated with vaginal delivery, beliefs requiring a specific day and time for childbirth; institutional and professional settings of decision making, doctor's personal preference, supplier-induced demand and consideration of financial benefits (Lei et al., 2003; Mossialos et al., 2005; Habiba et al., 2006; Waldenstrom et al., 2006; McCourt et al., 2007; Taljaard et al., 2009; Lumbiganon et al., 2010). In addition, the decline in midwife-led care in community health institutions may also contribute to the rise of CS (CHIMACA Research Group, 2007), and skilled midwife-led care has been shown to be related with more possibilities of spontaneous vaginal birth and improved pregnancy outcomes (Hattem et al., 2008). There is, however, limited research that has analysed both medical and non-medical determinants of CS rates and their interactions. There is in particular little information available from rural settings in China where there is rise in CS. The objectives of this study were to determine the population based CS rates in two counties in rural China and explore the factors associated with choice for CS as mode of delivery. To examine the complex inter-relationships between the determinants of CS we used a new approach—structural equation modelling.

Methods

The data presented in this paper were generated as part of a broader international research project, on maternal health care in rural China, entitled 'Structural hindrances to and promoters of good maternal care in rural China (CHIMACA)'.

Data collection

The data presented in this paper were generated from the baseline research of a broader intervention project. Within Anhui province, two counties were selected using the following criteria: (1) the local government was interested in the project and willing to participate; (2) one of the counties (FC) had re-instated a health insurance scheme; the New Cooperative Medical Scheme (NCMS); (3) there were no other maternal health-care improvement programmes ongoing in the counties at the time of the study. It was agreed with the county leaders not to disclose the identity of the participating counties in publications, so acronyms are used in place of full names in this paper.

Integrated maternal health-care networking has been established in rural China since the beginning of the millennium. In rural maternal care systems, antenatal, intrapartum and postnatal

care are mainly provided by obstetricians. Routine antenatal care is provided by obstetricians from county hospitals and township hospitals. Rural women usually have their first antenatal visit within three months of pregnancy in their residential township hospital and make appointments for regular antenatal care. Typically, women would choose the same provider for antenatal care and for delivery, except under the following circumstances: when referred to high-level hospitals due to pregnancy-related complications, when re-located to other places during delivery, or when they wanted to choose a better hospital for childbirth. As to intrapartum care, due to the limited professional staff in community hospitals, there is no clear distinction between obstetricians and midwives. Midwifery training, which is special for labour and intrapartum care, has declined in recent years in rural China. Thus midwifery care in township hospitals has not been fully established. Township doctors, who have received general medical training, are responsible for both vaginal and caesarean delivery. There are clinical guidelines on caesarean section at the provincial level but no clear supervision mechanisms put in place to monitor the use of clinical indicators for the selection of CS, and there is much reliance on the doctors' and/or women's preference (CHIMACA Research Group, 2007). The government funding for public health has been increased in recent years, but the allocation for maternal health care is not enough. The Government only pays 55% of full salaries of the authorised staff in township hospitals and the remaining 45% must be earned themselves. The provider payment mechanisms and revenue-related bonus payments are main resources of doctors' income.

A household survey was conducted in December 2006 to collect data on utilisation of maternal health services. Considering the population in two counties, all 18 townships in FC county and 12 townships (out of 20 selected by geographic characteristics and distance) in XC county were selected. Among these townships, six in FC county and three in XC county were randomly selected. All women who gave birth in all villages in these selected nine townships between January 2005 and December 2006 and who were rural residents were identified, traced and where possible interviewed using a structured questionnaire (Fig. 1). The objectives of the baseline survey were to understand the maternal health-care situation in two rural areas. Therefore, women who worked outside the home county during pregnancy and delivery, i.e., received maternal health care in other places were excluded.

Items in the questionnaire were developed from literature reviews, interviews with key informants of rural maternal health care. Expert consultations were conducted after the original questionnaire was developed. Items included general demographic information for the woman and her household, socio-economic status and NCMS membership, general medical and obstetric history, utilisation of maternal health services and reasons for this. Every question was clearly illustrated, specified and localised in a systematic training package. Then a pilot study was undertaken with 12 women in two townships in FC county with nearby township hospitals. No difficulties in understanding the questionnaire were identified.

A qualitative method was designed in the baseline research. Focus Group Discussions (FGD) with township hospital doctors, village FP workers and women who had delivered in the last two years were recruited as the participants by local co-ordinators and research team members using the following criterion: (1) familiar and informative to the current MCH situation; (2) from different townships and villages as possible when considering the required number; and (3) with different distance and economic level when considering the different townships and villages. The three types of participants were separately organised and on average there were six people in each group. Certain guidelines were used in each type group to explore perceptions surrounding CS, decision-making and factors

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