

Evidence-based reproductive health care in Cameroon: population-based study of awareness, use and barriers

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Objective To estimate the prevalence of awareness and use of evidence-based reproductive health interventions and to describe the barriers associated with the use of evidence-based interventions among health providers in north-west Cameroon.

Methods In February 2004, a population-based descriptive study of the awareness and use of 13 evidence-based interventions targeted health workers providing reproductive health care. Their awareness and use of a composite of four vital interventions was also evaluated. These were peripartum use of antiretrovirals to prevent transmission of HIV, antenatal corticosteroid administration, magnesium sulfate prophylaxis and active management of placental delivery with uterotonics. In-depth interviews with key informants were conducted as part of a qualitative substudy to discover the barriers to the use of evidence-based interventions.

Findings Overall, 91.4% (328/359) of reproductive health workers were surveyed. Their awareness of evidence-based interventions varied from 29% for the use of antenatal corticosteroids to 97% for the use of iron and folic acid supplementation during pregnancy. Their use of these interventions ranged from 10.2% for antenatal corticosteroids to 94.8% for iron and folic acid supplementation. Only 50/322 (15.5%; 95% confidence interval (CI) = 11.8–20.0) of health workers were aware of all four vital interventions, and only 12/312 (3.8%; 95% CI = 2.0–6.6) reported using all of them regularly.

A total of 26 key informants participated in the qualitative substudy. A deficiency in the education and training of health workers, especially a lack of continuing education, was commonly identified as the most important barrier to their awareness of evidence-based practices. A lack of awareness and a lack of supplies and materials were the main barriers to practice.

Conclusion The awareness and practice of important evidence-based reproductive health interventions were less than optimal. To improve maternal and perinatal outcomes both remedial programmes to enhance awareness, including continuing education for health workers, and the provision of necessary supplies are needed.

Keywords Reproductive health services; Evidence-based medicine; Health personnel/education; Health knowledge, attitudes, practice; Pregnancy complications/drug therapy; Adrenal cortex hormones/therapeutic use; Anti-retroviral agents/therapeutic use; Magnesium sulfate/therapeutic use; Tocolytic agents/therapeutic use; Population surveillance; Cameroon (*source: MeSH, NLM*).

Mots clés Services de médecine de la reproduction; Personnel sanitaire/enseignement; Médecine factuelle; Connaissance, attitude, pratique; Grossesse compliquée/chimiothérapie; Hormones corticosurréaliennes/usage thérapeutique; Agents antirétroviraux/usage thérapeutique; Sulfate magnésium/usage thérapeutique; Agents tocolytiques/usage thérapeutique; Surveillance population; Cameroun (*source: MeSH, INSERM*).

Palabras clave Servicios de salud reproductiva; Personal de salud/educación; Medicina basada en evidencia; Conocimientos, actitudes y práctica sanitarias; Complicaciones del embarazo/quimioterapia; Corticosteroides/uso terapéutico; Agentes antirretrovirales/uso terapéutico; Sulfato de magnesio/uso terapéutico; Agentes tocolíticos/uso terapéutico; Vigilancia de la población; Camerún (*fuentes: DeCS, BIREME*).

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Voir page 901 le résumé en français. En la página 902 figura un resumen en español.

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Introduction

More than 500 000 women die annually from pregnancy-related complications and millions become ill from these complications (1). Altogether, 99% of these deaths occur in the developing world, especially Africa, where the average risk of pregnancy-related death is 1 in 13, compared with 1 in 4085 in developed countries (1). Also, 98% of neonatal deaths occur in developing countries: 42 neonates die per 1000 live births in Africa compared with at most 10 neonates per 1000 live births in developed countries (2). More than 70% of maternal deaths are caused by haemorrhage, infection, unsafe abortion, eclampsia and obstructed labour (3). Strategies proposed to improve maternal health include having skilled attendants present at delivery, having high quality reproductive health services available, allowing women to prevent unwanted pregnancies and giving them access to safe abortions (4). It is vital to use an evidence-based approach to maternal and neonatal health in areas where resources are constrained (5). Access to reliable evidence-based information is tenuous in developing countries (6), even though it is perceived as providing the most cost-effective and achievable strategy for sustaining improvements in health care (7). The WHO Reproductive Health Library (8) provides evidence-based information that is relevant to developing countries and was developed specifically to bridge the knowledge gap. However, information about whether health workers are aware of or use evidence-based interventions is mostly anecdotal.

We undertook a study in Cameroon to establish baseline information prior to intervening to improve evidence-based care. We focused on the English-speaking North-West Province where there are 1.8 million inhabitants and 32 000 deliveries annually. The coverage of antenatal care is 80%; more than 60% of deliveries are attended by a trained professional (9); and the maternal mortality ratio is estimated at 730 deaths per 100 000 live births (10).

Our objectives were, first, to estimate the prevalence of the awareness and use of certain evidence-based reproductive health interventions among health-care providers in this part of Cameroon. We also assessed their awareness and use of a composite intervention comprising four interventions we considered to be vital. Our second objective was to identify barriers to the awareness and use of evidence-based interventions.

Methods

Design and participants

A population-based survey of all reproductive health workers in the North-West Province of Cameroon was conducted in February 2004. Follow-up in-depth interviews were conducted with a subset of health workers in order to discover barriers to the uptake of evidence-based health interventions (11, 12).

The institutional review boards of Baylor College of Medicine, Houston, TX, and the University of Texas, Houston, and the Provincial Delegate for Health in Cameroon approved the study's protocol. All participants gave informed consent.

Evidence-based reproductive interventions

Version 5 of the WHO Reproductive Health Library, which is an extract of the Cochrane Library, contained 70 systematic reviews of reproductive health interventions, including commentaries, discussions and recommendations relevant to developing countries. We selected 11 interventions that had evidence of effectiveness, one with evidence of harm (routine episiotomy) and one that was of uncertain practical benefit in resource-poor settings (routine Caesarean for breech birth at term). These 13 interventions and their key effects are presented in Table 1 (13–27).

We considered a composite of four interventions to be vital: management of placental delivery with uterotonics, the administration of magnesium sulfate to prevent convulsions in eclampsia, the antenatal use of corticosteroids for impending preterm delivery, and the peripartum administration of anti-

Table 1. Interventions selected for inclusion in the study of evidence-based reproductive health care in Cameroon, 2004

Intervention	Effects
Actively manage third stage of labour by administering uterotonic drugs	Reduces volume of blood loss and incidence of postpartum haemorrhage (13)
Choose magnesium sulfate over other anticonvulsants to treat eclampsia	Reduces recurrence of seizures and maternal mortality (14–16)
Use corticosteroids for impending preterm birth	Reduces neonatal morbidity and mortality (17)
Use nevirapine or zidovudine to prevent mother-to-child transmission of HIV	Reduces mother-to-child transmission of HIV and probably also reduces maternal morbidity (18)
Use prophylactic antibiotics during Caesarean section	Reduces incidence of maternal infection and death (19)
Use antibiotics for asymptomatic bacteriuria	Prevents pyelonephritis and preterm birth (20)
Use periconceptional folate supplementation	Prevents neural tube defects (21) and nausea and vomiting of pregnancy
Use emergency contraception (oral contraceptives, levonorgestrel, mifepristone or intrauterine device)	≥ 75% reduction in unwanted pregnancy after unprotected sexual intercourse (22)
Plan to use Caesarean section for term delivery in breech presentation	Reduced infant morbidity and mortality (23)
Encourage use of companion or other social support during labour	Reduces need for pain relief, enhances birth experience and probably reduces operative deliveries and duration of labour (24)
Routinely use folate and iron supplementation during pregnancy	Prevents anaemia at delivery and postpartum (25)
Use external cephalic version for term delivery in breech position	Reduces number of caesarean and breech deliveries (26)
Avoid routine use of episiotomy	Reduces maternal morbidity (27)

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retroviral drugs to prevent the transmission of HIV. The first two interventions address major causes of maternal mortality, and the latter two address major causes of perinatal mortality and morbidity. We assessed whether health workers used all of these interventions routinely and whether they were aware of all four of them.

Instruments and procedures

A three-part, 40-item pretested self-administered questionnaire, which used Dillman's validity enhancing strategies (28), was administered. Health units providing reproductive health care (prenatal, intrapartum and postpartum services) in all 14 health districts were targeted. These included hospitals and health centres run by the government, as well as missionary (nongovernmental) hospitals and health centres and private hospitals and health centres. The target population was all physicians, health workers in charge of health units or health centre maternity units, and all health workers at maternity units at district and provincial hospitals. Those health workers included were actively providing reproductive health care at the time of the study.

Most participants at health centres and hospitals were surveyed together during scheduled meetings at district hospitals. Absentees were subsequently individually enrolled. Respondents were encouraged to write comments on questionnaires to clarify their answers; questionnaires were screened for completion by the respondent prior to placement at a neutral spot to assure anonymity. Surveys were followed by an educational debriefing session during which WHO recommendations were discussed. Debriefing also served as a way to monitor the validity of the questionnaires.

Only those who had taken part in the questionnaire survey and debriefing were eligible to be enrolled in the qualitative substudy. We selected a purposive sample of 26 workers in charge of health units or maternity sections, representing a mix of professional categories, types of facility (private or governmental and hospitals or health centres) and location within the province. All of those approached agreed to participate. The interviews were conducted by one of the authors (ATNT) in English, the official language in the province. An interview guide presenting key topics to be explored was used. Demographic information was collected as was information on barriers that might prevent health workers from knowing about or using evidence-based interventions. Interviews were tape-recorded and handwritten notes were also made; interviews were conducted in private and lasted 20–40 minutes. A trained assistant performed verbatim transcription of the tapes. Tapes and transcripts were completely reviewed and compared with written notes.

Data management and analysis

A Microsoft Access 2000 database was used for survey management and quality control. If it was unequivocally clear from a written comment on the questionnaire that the wrong response had been selected, the correct option was coded and entered into the database. Responses were categorized into dichotomous outcomes corresponding to the presence or absence of the awareness or use of evidence-based interventions. Data were analysed using SPSS statistical software, version 11.0 (SPSS, Chicago, IL) and Stata, version 6.0 (Stata, College Station, TX).

Analysis of the qualitative data was done using open coding, data reduction, categorization, axial coding and selective coding. Methods of case analysis and cross-case analysis were applied to identify patterns and salient themes in the data (29).

Sample size

Preliminary information indicated there were about 350 health workers who met the inclusion criteria. This sample size was sufficient to use awareness of the composite vital interventions as the primary outcome with a validated formula (30): 385 participants would be needed to estimate a prevalence of 50% to a precision of $\pm 5\%$, and only 96 would be needed for a precision of $\pm 10\%$.

Enrolment in the qualitative substudy was stopped after 26 interviews because major themes were recurring frequently.

Findings

A total of 328 reproductive health workers in 188 of 204 (92.2%) eligible health units in North-West Cameroon were surveyed, including 54 of 63 (85.7%) physicians and 274 of 296 (92.6%) non-physicians. Units not represented in the survey were physically or administratively inaccessible or had workers who were absent or excluded because they had inadvertently participated in a debriefing session prior to being surveyed. Only one health worker did not return a survey. A total of 108 participants (32.9%) wrote comments. At least one response was re-coded on 10 questionnaires (3.0%) based on unequivocal comments.

Descriptive characteristics

Characteristics of survey respondents are presented in Table 2 (web version only, available from www.who.int/bulletin). Reproductive health workers had a mean age of 40.9 years and a mean of 13.3 years of work experience. Few were obstetricians: most were government workers and only 25% had access to a library or to the Internet or email. Awareness of the Reproductive Health Library was low, and access to it was limited. On average, health workers read a journal or accessed a database only three times per year, and they attended fewer than two educational events over three years: most had done neither.

A total of 13 female and 13 male health workers in charge participated in the qualitative substudy: 9 nurses, 10 midwives and 7 physicians (2 obstetrician–gynaecologists). Sixteen of the participants were government employees; three worked in the private-for-profit sector; and 7 worked at facilities run by missionaries or nongovernmental organizations.

Awareness and use of evidence-based interventions

In Table 3, the prevalence of the awareness and use of evidence-based interventions are presented. The levels of awareness of 9 interventions and the use of 11 were below 80%; levels were below 50% for up to 6 and 8 interventions, respectively. Awareness of the vital interventions was extremely low: only 15.5% (50/322) of participants knew about all four of them. Awareness was lowest for the use of antenatal corticosteroids: only 29.0% (95/328) knew about this intervention. The use of magnesium sulfate to treat eclampsia was another vital intervention that was not well known (48.9%; 159/325). Awareness of emergency contraception was poor (34.0%; 111/326) as

Table 3. Awareness and use of evidence-based reproductive health interventions among health workers surveyed in Cameroon, 2004

Reproductive health intervention	Aware of intervention ^a		Use intervention ^a	
Composite of four vital interventions ^b	50/322	(15.5; 11.8–20)	12/312	(3.8; 2.0–6.6)
• Antenatal corticosteroids for prematurity	95/328	(29.0; 24.1–34.2)	33/323	(10.2; 7.1–14.0)
• Peripartum anti-HIV prophylaxis	289/326	(88.7; 84.7–91.9)	130/325	(40.0; 34.6–45.6)
• Uterotonics to reduce bleeding	271/327	(82.9; 78.3–86.8)	231/323	(71.5; 66.3–76.4)
• Magnesium sulfate for eclampsia	159/325	(48.9; 43.4–54.5)	79/319	(24.8; 20.1–29.9)
Antibiotic prophylaxis for Caesarean section ^c	279/328	(85.1; 80.7–88.7)	123/170	(72.4; 65.0–78.9)
Antibiotics for asymptomatic bacteriuria	220/328	(67.1; 61.7–72.1)	171/324	(52.8; 47.2–58.3)
Periconceptual folate supplementation	127/326	(39.0; 33.6–44.5)	87/324	(26.9; 22.1–32.0)
Emergency contraception	111/326	(34.0; 28.9–39.5)	50/325	(15.4; 11.6–19.8)
Plan to use Caesarean section or referral for term birth in breech position	209/328	(63.7; 58.3–68.9)	151/321	(47.0; 41.5–52.7)
Social support during labour	147/325	(45.2; 39.7–50.8)	92/321	(28.7; 23.8–33.9)
Iron and folic acid supplementation during pregnancy	318/328	(97.0; 94.5–98.5)	307/324	(94.8; 91.7–96.9)
Use external cephalic version for breech or refer if breech position at term	129/328	(39.3; 34.0–44.8)	97/322	(30.1; 25.2–35.5)
Avoid routine use of episiotomy	237/328	(72.3; 67.1–77.0)	279/325	(85.8; 81.6–89.4)

^a Figures in this column are numerator/denominator (percentage; 95% confidence interval).

^b This composite measure includes the four interventions in the table indicated by bullet points.

^c Non-physicians who reported that they did not perform caesarean sections were excluded from this question.

was knowledge of periconceptual folate (39.0%; 127/326), external cephalic version (39.3%; 129/328) and the provision of social support during labour. The best-known intervention was the use of iron and folic acid supplementation during pregnancy (97.0%; 318/328).

The use of the four vital interventions was extremely low: only 12/312 (3.8%; 95% confidence interval (CI) = 2–6.6%) of participants used them. The intervention that was least likely to be used was antenatal corticosteroids (33/323; 10.2%). Magnesium sulfate was not used often (79/319; 24.8%) nor was peripartum antiretroviral treatment (130/325; 40%). Uterotonics were likely to be used (231/323; 71.5%). Iron and folic acid supplementation was the intervention that was most likely to be used (307/324; 94.8%). For 12 of the 13 interventions, prevalence of awareness was higher than prevalence of use, with peripartum antiretroviral treatment showing the largest difference between awareness and use. Interestingly, the practice of avoiding routine episiotomy exceeded awareness of the evidence (86% avoided the use of it versus 72% who were aware of the evidence).

Perceived levels of awareness and use

Health workers' perceptions of the awareness and use of the 13 interventions by other health workers were elicited during interviews and are presented in Table 4. Their responses confirmed that there was both a lack of awareness of the evidence for and lack of use of antenatal corticosteroid therapy, magnesium sulfate for seizure prophylaxis and emergency contraception. They also confirmed that there was universal use of uterotonics and iron and folate supplementation. Also, the practice of avoiding routine episiotomy was perceived to be higher than the awareness of the evidence for avoiding it. Participants believed that almost no one used periconceptual folate supplementation to prevent neural tube defects.

Quotations highlighting the barriers to the awareness and use of evidence-based interventions are presented in Box 1 and discussed below.

Barriers to awareness

The overwhelming theme of the interviews was that the education and training of health workers was deficient.

Deficiencies in education and training were cited by 21 of the 26 health workers as a general barrier. They were also the most frequently cited barriers to the awareness of nine of the interventions, including the use of antenatal corticosteroids, emergency contraception, periconceptual folic acid and prophylaxis with magnesium sulfate. Four underlying barriers were identified, the first being the absence of continuing education (Box 1, quote 1). This was the most frequently cited general and specific barrier. Suggestions made about means to rectify this deficiency and improve the awareness of evidence-based interventions included the use of seminars, refresher courses, daily physician-led ward rounds and weekly lectures at the hospitals. The second quotation in Box 1 illustrates this common sentiment.

The second underlying barrier was a lack of adequate formal training. This barrier was attributed primarily to medical and nursing school curricula that failed to emphasize evidence-based care.

The third underlying barrier was a lack of access to educational resources. Participants said they had difficulty gaining access to health journals, newsletters, databases and books. This was seen to contribute to their lack of awareness. Only one public library (run by the British Council) existed in the province.

The fourth underlying barrier was a lack of a habit of self-learning. Some participants cited the lack of a fundamental culture that encouraged reading and updating knowledge as another underlying factor (Box 1, quote 3).

Participants cited a lack of exposure to evidence-based interventions as another barrier to the awareness of these

Table 4. Frequency of perceived lack of awareness and use of evidence-based reproductive health interventions among 26 key informants, Cameroon, 2004

Intervention	Complete lack (n = 26)		Partial lack ^a (n = 26)	
	Awareness	Practice	Awareness	Practice
Peripartum use of anti-HIV drugs	0	8	5	7
Use of antenatal corticosteroids for prematurity	18	21	7	5
Use of magnesium sulfate for seizure prophylaxis	16	21	3	3
Use of uterotonics during third stage of labour	0	0	0	1
Prophylactic use of antibiotics for Caesarean section	2	4	0	0
Use of antibiotics for asymptomatic bacteriuria	9	11	2	2
Use of periconceptional folic acid to prevent neural tube defects	24	26	2	0
Presence of a companion during labour	8	14	1	4
Avoidance of routine episiotomy	5	1	1	1
Routine use of Caesarean section for breech position at term	20	22	2	1
Use of external cephalic version for breech position	12	21	3	3
Routine use of antenatal folic acid and iron	0	0	0	0
Use of emergency contraception	23	26	1	0

^a This partial lack of awareness of certain practices was most often limited to non-physicians who constitute the majority of reproductive health workers in Cameroon.

interventions. This response was given to explain the lack of awareness of interventions, such as corticosteroids, magnesium sulfate prophylaxis, social support during pregnancy and emergency contraception. Altogether, 21 health workers attributed their lack of awareness of the use of caesarean section for breech births at term to the widespread view of the breech position as a normal presentation (Box 1, quote 4).

Some health workers felt that the advent of new evidence-based interventions led to a lack of awareness because new information was not disseminated in a timely fashion (Box 1, quote 3).

Other barriers that were cited less frequently included the disbelief or denial of the existence of certain diseases, such as HIV/AIDS; the implementation of government policies that fail to promote evidence-based interventions; and the existence of unqualified supervisors who are unable to educate their subordinates.

Barriers to use

The barriers to the use of evidence-based interventions were primarily a lack of awareness of these interventions and a lack of necessary materials and supplies.

Lack of awareness of interventions. The lack of awareness of evidence-based interventions was the barrier that was most frequently cited and was perceived to impede the use of 11 interventions. It was cited by all 26 health workers to explain the low use of periconceptional folic acid.

Lack of supplies. A lack of necessary supplies was felt by many health workers to impede their use of evidence-based medicine. For example, they cited a lack of magnesium sulfate, as well as a lack of testing materials and medications for HIV, and a shortage of operating rooms where there was adequate equipment to perform Caesarean sections.

Negative sociocultural beliefs. Negative sociocultural beliefs were believed to impede the practice of interventions such as the administration of peripartum antiretroviral treatment, the provision of companionship during labour and the routine use of Caesarean sections for breech births. Participants stated

that patients refused to accept testing, treatment and other services associated with HIV because of stigma and taboos. Male companionship during labour and delivery was taboo in some cultures. Other companionship was often refused because of concerns about witchcraft, privacy and gossip. Refusal of Caesarean sections was frequently related to the belief that the surgery portends reproductive failure (Box 1, quote 9).

Financial barriers. Poverty at all levels (state, family and individual) was also described as a barrier to the use of evidence-based interventions. State poverty ultimately leads to a lack of necessary supplies. Patients' inability to afford treatments, including antibiotics (for Caesarean sections or asymptomatic bacteriuria), and the high cost of Caesarean sections were also cited.

Other barriers. The other barriers cited by participants encompassed a diverse range of issues. They are outlined below.

- The widespread use of alternative interventions was perceived to be a deterrent to evidence-based practice. The use of less efficacious antiseizure regimens prevented magnesium sulfate prophylaxis; the use of vaginal delivery for breech births prevented the use of Caesarean sections.
- Religion was also perceived to be a barrier. For example, the use of emergency contraception is prohibited at Catholic health units.
- A lack of promotion by the government was blamed for the non-use of interventions such as antenatal corticosteroids, magnesium sulfate and periconceptional folic acid.
- A shortage of skilled health staff also prevented the use of some interventions. For example, a shortage of physicians contributed to the lack of use of Caesarean sections and external cephalic version for breech births. The retirement of older midwives limited the use of some interventions (Box 1, quote 6). A lack of skills resulted in an avoidance of routine episiotomy (Box 1, quote 7).
- A lack of access to reproductive health units was perceived to prevent the administration of peripartum antiretroviral treatment, antenatal corticosteroids and the use of Caesarean section or external cephalic version for breech births.

Box 1. Quotations from qualitative interviews selected to highlight predominant themes

1. "I am just happy with these few minutes we have spent today because for me this is my midwifery revision after 34 years," *midwife in charge of district hospital maternity unit.*
2. "If you could help us conduct some useful seminars like this every year, it would be very helpful for us to get to know some of the things we don't know," *nurse in charge of district hospital maternity unit (referring to debriefing session).*
3. "Well, we don't read or do research and we lack current books or journals to be updated on things that are new. We rely on seminars to be informed and we don't even have them," *head of health centre.*
4. "We don't know about routine Caesareans for breech babies because most of our breech deliveries are normal. Midwives do them and it is very normal," *midwife.*
5. "Some women think that it is a reproductive failure on their part not to be able to deliver vaginally. They think they are unlucky or bewitched if they have to go through a caesarean. Traditionally, though, grandmothers believe that twins have powers and know that breech also have their problems; thus they say a singleton breech is a twin with one baby not revealing itself," *experienced obstetrician.*
6. "I was taught how to do it [external cephalic version] by the old midwives," *obstetrician.*
7. "We did not know that it [routine episiotomy] was harmful but we did our best to avoid it, and I would prefer to repair a tear rather than cause one," *midwife.*
8. "In fact, I, in particular, believe that when the family members are in the labour room the patient tends to be uncooperative and naughty, thinking that they should be flattered by their companions before they cooperate," *district health director.*
9. "I not only don't do it [external cephalic version]; I actively discourage it because it is very dangerous," *medical officer.*

- Barriers among staff and in health units were also identified. Misdiagnosis, misconceptions (Box 1, quote 9), the insecurities of health workers, paternalistic perceptions (quote 8), and obligations to maintain privacy prevented the practise of some interventions, including external cephalic version and the use of a companion during labour.
- A lack of demand was also cited, specifically with regard to emergency contraception.

Discussion

Overall, the awareness and use of evidence-based interventions in reproductive health care was poor, although not uniformly so. Use consistently lagged behind awareness, except in the case of routine episiotomy for which practice paradoxically exceeded awareness of the evidence. Only 15% of participants were aware of all four of the key interventions likely to yield the largest benefits in preventing maternal and perinatal mortality and morbidity, and only 3–4% of participants used all four interventions. Among interrelated barriers, deficiencies in education and training, especially a lack of continuing education, were the principal barriers to awareness. A lack of awareness of evidence-based interventions and a lack of requisite supplies and materials were the leading barriers to use.

Our findings are consistent with those of a hospital-based study in China that concluded obstetric practice did not follow

the best available evidence (31). Variation in the awareness and use of individual interventions is reflected by the 82% rate of use of routine episiotomy in the study in China compared with the 85.5% avoidance rate we found in Cameroon.

We gained insight into the reasons for the wide variation in the awareness and use of interventions. Many variables interact to bring about the variations; these include intervention-specific differences in education and training, the availability of supplies, government policy, the public health importance of related diseases, resource mobilization and duration of availability of evidence supporting interventions.

The fact that many health workers were aware of the use of peripartum antiretroviral drugs (such as nevirapine) to prevent mother-to-child transmission of HIV was likely to be the result of general government policies designed to sensitize the population to HIV/AIDS. No governmental programme to prevent transmission was active. However, the Baptist health service, through an internationally funded programme to prevent HIV transmission from mother to child, was considered to have played a leading part in enhancing the awareness and practise of this intervention. The programme provided ongoing training to government and private health workers as well as supplies (including nevirapine) at no cost to clients. Consequently, despite the 50% lag relative to awareness, the fact that 40% of participants reported using this intervention represented a tremendous improvement from 3% in 2001 (32). Eclampsia and neural tube defects were familiar to health workers as were low birth weight and prematurity, which contributed significantly to infant mortality (33). However, few health workers were aware of the interventions for these conditions, although they have been available for more than a decade. Some health-care workers attributed this poor awareness to the "recent" advent of the interventions. Obviously, educational deficiencies contribute too. Generally, a lack of use was primarily related to a lack of awareness. Thus, despite their widespread availability and postnatal use, corticosteroids were not given antenatally for prematurity. Magnesium sulfate was unavailable to the few physicians aware of its efficacy. The government had not promoted these interventions by including them in essential service packages unlike the interventions that were more likely to be used (iron and folic acid supplementation).

While the awareness of evidence-based interventions does not always translate into use, as indicated by the consistent lag in the prevalence of use relative to awareness, our results also show that higher levels of awareness are associated with higher levels of use. The paradox that higher levels of avoidance of routine episiotomy existed than did awareness of the evidence was explained by the lack of the requisite skills.

Limitations to our study include the fact that assessment of use was based on participants' own reports. We expected health workers to over-report practices. In one study in the United States over-reporting accounted for 50% of positive responses (34). Consequently, our results are conservative. The ability of qualitative methods to determine the relative importance of all barriers is limited (11). Barriers affecting patients and the non-medical community may not have been completely captured.

We assessed information bias as it related to two of the interventions. First, debriefing sessions revealed that 3/23 respondents mistook periconceptional folic acid for folic acid and iron supplementation. Adjusting for this mistake reduced the prevalence of awareness of periconceptional folic acid to

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at most 26% and of the use of it to 14%. Second, 14/108 respondents who wrote comments had probably over-reported the planned use of Caesarean sections for breech births. Adjustment reduced awareness to at most 50.7%. Nevertheless, the implication of a policy of routine caesarean section for breech birth is uncertain in such resource-poor settings where there is limited access to equipped operating rooms.

Our study revealed an opportunity for improving poor maternal and perinatal outcomes by addressing low and discrepant levels of awareness and use of effective reproductive health interventions (35). It is possible for levels of awareness and use to exceed 95%, as was seen in the case of iron and folic acid supplementation. Evidence-based medicine improves health outcomes, fosters cost effectiveness and increases patients' satisfaction (36–41), despite some criticisms that it promotes orthodoxy and could be exploited to ration health care (36, 42).

There is an urgent need to design programmes to improve the awareness and use of evidence-based reproductive health care in countries like Cameroon. Such programmes would benefit from information regarding potential barriers to uptake (43) and should apply strategies proven to sustain continuing education (44). (44, 45). In complex scenarios, where there are multiple interacting factors, improved awareness of evidence-based interventions alone may be insufficient to change practice. Therefore,

strategies to enhance their use must establish mechanisms to maintain the availability of the supplies and materials necessary to implement interventions. The key is to develop a comprehensive approach that extends the focus beyond health workers to the practice setting and wider environment and that is based on the specifics of evidence-based interventions; associated barriers and incentives to change must also be addressed (44). Such an approach, which applies multiple interventions, is more likely to achieve sustainable change (46). ■

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Résumé

Soins de santé génésique fondés sur l'expérience au Cameroun : études en population de la connaissance et de la mise en œuvre de ces soins, ainsi que des obstacles rencontrés dans cette mise en œuvre

Objectif Estimer la fréquence de la connaissance et de l'utilisation d'interventions de santé génésique reposant sur l'expérience et décrire les obstacles s'opposant à la mise en œuvre de ces interventions par les soignants au nord-ouest du Cameroun.

Méthodes En février 2004, une étude descriptive en population de la connaissance et de l'utilisation de 13 interventions reposant sur l'expérience a été menée chez des agents de santé dispensant des soins de santé génésique. On a également évalué la connaissance et l'utilisation d'un ensemble de quatre interventions vitales à savoir, l'utilisation pendant le périmètre d'antirétroviraux pour prévenir la transmission du VIH, l'administration prénatale de corticostéroïdes, la prophylaxie par le sulfate de magnésium et la prise en charge active de la délivrance placentaire au moyen d'utérotoniques. Des entretiens approfondis avec des informateurs clés se sont déroulés dans le cadre d'une étude subsidiaire qualitative, visant à déterminer les obstacles à l'utilisation d'interventions reposant sur l'expérience.

Résultats Au total, 91,4 % (328/359) des soignants en santé génésique ont participé à l'enquête. Leur connaissance des interventions reposant sur l'expérience se situait entre 29 % pour l'utilisation prénatale de corticostéroïdes et 97 % pour l'utilisation de la supplémentation en fer et en acide folique au cours de la

grossesse. La mise en œuvre de ces interventions se situait entre 10,2 % pour l'administration prénatale de corticostéroïdes et 94,8 % pour la supplémentation en fer et en acide folique. Seuls 50 agents de santé sur 322 (15,5 % ; intervalle de confiance [IC à 95 % = 11,8-20,0) connaissaient les quatre interventions vitales et seuls 12/312 (3,8 % ; IC 95 % = 2,0-6,6) ont indiqué qu'ils les utilisaient tous régulièrement.

Au total 26 informateurs clés ont participé à l'étude subsidiaire qualitative. Des lacunes au niveau de l'éducation et de la formation des agents de santé, notamment l'absence d'une formation continue, ont été fréquemment identifiées comme l'obstacle le plus important à la connaissance des pratiques reposant sur l'expérience. Les connaissances insuffisantes et le manque de fournitures et de matériel étaient les principaux obstacles à leur mise en œuvre.

Conclusion La connaissance et la mise en œuvre d'interventions importantes en santé génésique et reposant sur l'expérience n'étaient pas optimales. Pour améliorer les résultats obtenus au niveau maternel et périnatal, il faut à la fois offrir des programmes pour renforcer les connaissances des agents de santé, notamment une formation continue, et apporter les fournitures nécessaires.

Resumen

Atención de salud reproductiva basada en la evidencia en el Camerún: estudio poblacional sobre los conocimientos, la aplicación y las barreras

Objetivo Estimar la prevalencia de los conocimientos y la aplicación de las intervenciones de salud reproductiva basadas en la evidencia, y describir las barreras que se oponen al uso de esas intervenciones entre los proveedores de asistencia sanitaria en el noroeste del Camerún.

Métodos En febrero de 2004 se realizó un estudio descriptivo poblacional sobre el conocimiento y uso de 13 intervenciones basadas en la evidencia, centrado en personal sanitario que dispensaba atención de salud reproductiva. Se evaluaron también sus conocimientos y aplicación de un conjunto de cuatro intervenciones fundamentales: el uso de antirretrovirales durante el parto para prevenir la transmisión del VIH, la administración prenatal de corticosteroides, la profilaxis con sulfato de magnesio y el fomento activo de la expulsión de la placenta con uterotónicos. Además, se llevaron a cabo entrevistas detalladas con informantes clave como parte de un subestudio cualitativo destinado a identificar las barreras a la aplicación de esas intervenciones basadas en la evidencia.

Resultados Se estudió en total al 91,4% (328/359) de los trabajadores de salud reproductiva. Su conocimiento de las intervenciones basadas en la evidencia variaba entre el 29% para la utilización prenatal de corticosteroides y el 97% para la

administración de suplementos de hierro y ácido fólico durante el embarazo. Su utilización de esas intervenciones variaba desde el 10,2% en el caso de los corticosteroides prenatales hasta el 94,8% en el caso de los suplementos de hierro y ácido fólico. Sólo 50 de 322 (15,5%; intervalo de confianza [IC] del 95% = 11,8–20,0) trabajadores sanitarios conocían las cuatro intervenciones esenciales analizadas, y sólo 12 de 312 (3,8%; IC95% = 2,0–6,6) señalaron que aplicaban todas ellas regularmente.

Un total de 26 informantes clave participaron en el subestudio cualitativo. La barrera más importante en cuanto al conocimiento de las prácticas basadas en la evidencia resultó ser una deficiente formación teórica y práctica del personal sanitario, especialmente la falta de enseñanza continua. La falta de conocimientos y la falta de suministros y material eran las barreras principales a la aplicación de esas prácticas.

Conclusión El conocimiento y la aplicación de importantes intervenciones de salud reproductiva basadas en la evidencia eran subóptimos. Para mejorar los resultados maternos y perinatales se necesitan tanto programas correctivos que aumenten los conocimientos, en particular enseñanza continua para los agentes de salud, como suministros suficientes.

Arabic

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Table 2. Characteristics of 328 health workers participating in study of evidence-based reproductive health practices, Cameroon, 2004

Characteristics of health workers	No. of health workers	%
Mean age (years) (<i>n</i> = 322)	40.9	8.5 (20–72) ^a
Male sex (<i>n</i> = 326)	171	52.5
Professional category (<i>n</i> = 325)		
Obstetrician/gynaecologist	6	1.8
General practitioner or other physician	48	14.8
Midwife	102	31.4
Nurse	140	43.1
Other	29	8.9
Mean no. of years since training (<i>n</i> = 325)	13.3	9.1 (0–42) ^a
Has had additional public health training (<i>n</i> = 326)	157	48.2
Type of health unit (<i>n</i> = 328)		
Governmental	223	68.0
Nongovernmental or missionary	64	19.5
Lay private	31	9.5
Other	10	3.0
Health unit located in provincial capital (<i>n</i> = 328)	87	26.5
Health worker is on faculty or is a clinical preceptor of medical or nursing students (<i>n</i> = 318)	80	25.2
Health worker has access to library (<i>n</i> = 322)	74	23.0
Health worker has access to Internet or e-mail (<i>n</i> = 322)	85	26.4
Mean no. of times used health journal or database in the past year (<i>n</i> = 309)	3.2	6.6 (0–51) ^a
Aware of RHL ^b (<i>n</i> = 324)	39	12.0
Health worker has access to RHL (<i>n</i> = 325)	11	3.4
Mean no. of workshops or conferences attended in past 3 years (<i>n</i> = 320)	1.5	2.5 (0–20) ^a

^a For continuous values, the figures in this column are the standard deviation (range).

^b RHL = WHO Reproductive Health Library.