International Journal of Gynecology and Obstetrics xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo

www.figo.org

CLINICAL ARTICLE

A multifaceted intervention to increase prophylactic oxytocin use during the third stage of labor and to reduce routine episiotomies in Nicaragua

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ARTICLE INFO

Article history:
Received 21 August 2013
Received in revised form 30 March 2014
Accepted 13 June 2014

Keywords:
Active management of third stage of labor (AMTSL)
Multifaceted intervention
Nicaragua
Oxytocin
Postpartum hemorrhage
Professional behavior change
Selective episiotomy
Uniject

ABSTRACT

Objective: To assess the effect of a multifaceted intervention among skilled birth attendants on the use of oxytocin during the third stage of labor, the active management of the third stage of labor (AMTSL), and the rate of routine episiotomy during vaginal births in two health districts in Nicaragua. *Methods:* An uncontrolled before-and-after study design was used. The rates of oxytocin use in the third stage of labor, AMTSL, and episiotomy were measured for vaginal births occurring in eight hospitals and health centers during 2011–2012, before and after implementation of a multifaceted facility-based intervention. The intervention involved the use of opinion leaders, interactive workshops to develop and implement evidence-based guidelines, academic detailing, the use of reminders, and feedback on the rates of oxytocin use and episiotomy. *Results:* Oxytocin use during the third stage of labor increased significantly from 95.3% to 97.4% ($P = 0.003$). The episiotomy rate dropped significantly from 31.2% to 21.2% overall, and from 59.6% to 40.5% in primiparous women ($P < 0.001$ for both comparisons). *Conclusion:* The multifaceted intervention improved the targeted care practices during childbirth. However, a further decrease in the routine use of episiotomy would be desirable.

1. Introduction

Postpartum hemorrhage (PPH) is the leading cause of maternal death worldwide and the second leading cause of death in Latin American countries [1,2]. Active management of the third stage of labor (AMTSL) can prevent up to 65% of PPH cases [3]. The three components of AMTSL are administration of a uterotonic agent (10 IU of oxytocin by intramuscular injection is the uterotonic drug of choice [4]) within 1 minute of childbirth, controlled cord traction (CCT), and uterine massage after delivery of the placenta. Administration of a uterotonic is the key component of AMTSL and is effective with and without CCT [4].

WHO, the International Federation of Gynecology and Obstetrics (FIGO), and the International Confederation of Midwives (ICM) currently recommend the routine use of AMTSL in all vaginal births [1,5]. WHO also recommends restricting the use of episiotomy [6] based on studies [7,8] showing that women with an episiotomy do not have significantly improved labor or delivery, and that episiotomies are associated with increased postpartum blood loss, postpartum hemorrhage, and other adverse consequences.

Despite this body of evidence and the recommendations made by international health organizations, providers do not necessarily apply the recommendations in the workplace. A survey in Nicaragua conducted in 2006 [9] found that, of 180 women whose vaginal births were observed, less than 2% benefited from AMTSL and only 11.5% received correctly administered uterotonic drugs. Similarly, the episiotomy rate is still very high in Nicaragua, and 84% of primiparous women had an episiotomy in 2004 [10].

There is strong evidence [11–15] that intensive multifaceted behavioral interventions targeted at birth attendants increase the use of evidence-based interventions. In Latin American countries, strategies combining the use of opinion leader engagement, interactive workshops to develop and implement evidence-based guidelines, academic detailing, reminders, and feedback on the rates of oxytocin use and episiotomy have been very effective in increasing the use of prophylactic oxytocin for PPH prevention and in reducing episiotomy rates [16,17].

The main aim of the present study was to evaluate whether a multifaceted intervention adapted from these successful strategies was

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http://dx.doi.org/10.1016/j.ijgo.2014.04.019
0020-7292/

effective in increasing the correct use of prophylactic oxytocin during the third stage of labor and in reducing the routine use of episiotomy in selected healthcare facilities in Nicaragua. Birth attendants' views regarding AMTSL and selective episiotomy prior to implementation of the intervention were also assessed, as were views on the use of the Oxytocin in Uniject (OiU; Instituto Biológico Argentino, Buenos Aires, Argentina) package at the end of the intervention period.

2. Materials and methods

A prospective study with an uncontrolled before-and-after design was carried out in two health districts—Chinandega and Chontales—in Nicaragua from August 1, 2011, to April 30, 2012. The study sites were selected by the Nicaraguan Ministry of Health (MINSA) based on estimates of compliance, and comprised two general hospitals and six health centers with labor and childbirth services. The study was approved by the Program for Appropriate Technology in Health (PATH) Research Ethics Committee, the MINSA Ad Hoc Ethics Committee, and the Institutional Ethics Review Committee of the MINSA National Center for Diagnosis and Reference. The women whose clinical data were included in the analysis provided oral or written informed consent. The birth attendants participating in the study provided written informed consent.

The study had a 3-month baseline period and a 6-month follow-up period, during which the intervention was implemented. During the baseline period, prior to implementation of the multifaceted intervention, a survey was carried out to assess the level of knowledge about, and attitudes toward, AMTSL and episiotomy among the birth attendants at the study facilities.

In the beginning of the 6-month intervention, a previously validated sociometric questionnaire [18] was used to identify 3–6 birth attendants (physicians, residents, or midwives) at each facility who were regarded as opinion leaders by their peers. The opinion leader teams participated in a 5-day workshop where they critically evaluated the medical literature and developed clinical practice guidelines on the management of the third stage of labor and the indications for episiotomy. In addition, the workshop covered communication skills and one-to-one educational strategies (academic detailing). Another 1-day workshop in training skills was conducted at each study facility.

After completion of their training, the opinion leader teams disseminated the guidelines they had developed and trained the birth attendants at their facility. In addition, they placed reminders to use oxytocin and avoid an episiotomy in labor and delivery wards, inside the birth attendants' delivery packs, and on clinical records. In addition, OiU packages with time-temperature indicators were distributed at the participating sites for use during AMTSL.

The opinion leader teams produced bimonthly reports on the rates of episiotomy and prophylactic oxytocin use, based on the clinical records at their facility. In addition, regional coordinators met with each team on a monthly basis to assess fulfillment of the intervention activities. Finally, PATH staff conducted routine monitoring visits, and reports on the findings were circulated to all birth attendants.

The primary outcomes were the prophylactic use of oxytocin during the third stage of labor and the performance of an episiotomy in women who had a vaginal birth. Secondary outcomes included the rates of CCT, uterine massage, blood transfusion, admission to an intensive care unit, and use of selected postpartum interventions (including uterine curettage, hysterectomy, and laparotomy) for the management of PPH. PPH is commonly defined as a blood loss of 500 mL or more within 24 hours after birth.

Trained in-hospital data collectors extracted the respective data from the clinical records of all women who gave birth vaginally during the 9-month study period, and completed paper data forms on a daily basis. The forms were photographed and sent to a data management center (the Montevideo Clinical and Epidemiological Research Unit, Montevideo, Uruguay), where they were entered into OpenClinica, a web-based data management system that is fully compliant with good clinical practice guidelines. The quality of the data was validated by observation of a random sample of 212 vaginal births in the follow-up period (7.2% of deliveries).

Descriptive statistics were calculated for the demographic and clinical characteristics of the women giving birth and the birth attendants. For the providers' questionnaire responses, frequencies were reported for the entire sample of birth attendants. The percentages for all primary and secondary outcomes were calculated globally and by study period, and compared using the χ^2 test. The data were analyzed with SPSS version 18.0 (SPSS Inc, Chicago, IL, USA). $P < 0.05$ was considered statistically significant.

3. Results

Of 160 skilled birth attendants reported to be working at the study facilities, 104 (65.0%) consented to complete the pre-intervention questionnaire. Of 103 for whom data were available on profession, 65 (63.1%) were doctors (general physicians or obstetricians/gynecologists), 16 (15.5%) were obstetric nurses, and 22 (21.4%) were doctors working in the community and not employed at a study facility or medical students in their final year (Table 1). Before the intervention, most considered the use of oxytocin, uterine massage, and CCT to be effective in preventing PPH (Table 2). In addition, 14 (13.5%) providers were reluctant to change their episiotomy practice, whereas 27 (26.0%) had already changed their practice, and 9 (8.6%) were planning or considering a change in their use of episiotomy (Table 2).

This questionnaire included three questions regarding opinions about OiU. Of the 104 respondents, 86 (82.7%) reported that the use of oxytocin in a preloaded device like Uniject seemed to be easier for the administration of oxytocin in the third stage of labor than the traditional method, 77 (74.0%) answered that OiU was preferred to standard oxytocin administration, but 84 (80.8%) answered that they would not stop using prophylactic oxytocin whether or not OiU was available.

A total of 3744 women who gave birth vaginally were invited to participate in the study, and 3712 women gave informed consent for the use of their data. Of the women who consented, 18 were excluded from the analysis because the delivery date was missing. Data were analyzed for the remaining 3694 women (baseline period, n = 766; follow-up period, n = 2928). The sociodemographic characteristics of the women during the baseline and follow-up periods were similar (Table 3). Of the women included in the baseline period, 322 (42.0%) had given birth for the first time and 84 (11.0%) had had four or more previous births; for those included in the follow-up period, these values were 1343 (45.9%) and 254 (8.7%), respectively.

The rate of correct oxytocin use in the third stage of labor was 95.3% at baseline (Table 4). This rate was considerably higher than that

Table 1
Characteristics of the birth attendants participating in the study (n = 104).[a]

Characteristic of the providers	Value
Age, y	35.6 ± 15.2
Female	63 (60.6)
Profession[b]	
Doctor	65 (63.1)
Nurse	16 (15.5)
Community doctor or medical student[c]	22 (21.4)
≤10 years since graduation	50 (48.1)
Number of deliveries per month[d]	
≤5	46 (52.3)
6–20	26 (29.5)
≥20	16 (18.2)

[a] Values are given as mean ± SD or number (percentage).
[b] n = 103.
[c] Doctors working in the community but not employed at a study facility, and medical students in their final year.
[d] n = 88.

Please cite this article as: García-Elorrio E, et al, A multifaceted intervention to increase prophylactic oxytocin use during the third stage of labor and to reduce routine episiotomi..., Int J Gynecol Obstet (2014), http://dx.doi.org/10.1016/j.ijgo.2014.04.019