Breastfeeding initiation, duration and exclusivity in mothers with epilepsy from South West China

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ABSTRACT

Purposes: 1) To study the breastfeeding initiation, duration and exclusivity rates, and common reasons for early weaning in Chinese mothers with epilepsy (MWE); 2) To identify potential perinatal breastfeeding correlations with selected sociodemographic and clinical factors.

Methods: A semi-structured questionnaire was administered to 281 MWE attending hospitals in South-west China from February 2014 to July 2015. Data about breastfeeding behaviors, sociodemographic, obstetric, and epileptic variables were collected. Descriptive analyses, followed by univariate and multivariate logistic regression analyses, were utilized to examine associations with breastfeeding, its duration and exclusivity.

Results: Breastfeeding initiation rate in MWE was 59.4%. At 3 months post partum total breastfeeding rate was 49.5% and exclusive breastfeeding rate was 36.3%. At 6 months, about one third (33.1%) of MWE had continued breastfeeding their babies and 12.8% of enrolled infants were exclusively breastfed. During lactation, fear of exposure of the babies to antiepileptic drugs (AEDs) via breast milk, frequent seizures, and insufficient breast milk supply were the commonest reasons for early cessation of breastfeeding. Mothers with epilepsy who had babies delivered at full term were more inclined to breastfeed their babies. Mothers who had gestational non-active epilepsy were more likely to engage in long-term breastfeeding. AED polytherapy was associated with poor breastfeeding behaviors in all aspects.

Conclusion: MWE in our study had a lower prevalence of breastfeeding than what would be expected in the general population, where approximately 95% breastfeed. Good seizure control and optimal antiepileptic therapy during gestation and lactation were associated with a higher rate of breastfeeding. Targeted intervention programs enhancing antenatal care services and breastfeeding consultation are needed.

1. Introduction

It has been widely documented and acknowledged that maternal milk is the ultimate source of nutrition for infants (Stam et al., 2013). Breastfeeding is beneficial to both mothers and infants. Breastfed infants are at a reduced risk of lower respiratory tract infections, necrotizing enterocolitis, allergic disease, obesity, diabetes, and otitis media (Greer et al., 2008; Ip et al., 2007; Ip et al., 2009). In terms of maternal outcome, lactation is associated with reduced postpartum blood loss and faster uterine involution. Mothers breastfeeding babies have a reduced risk of Type 2 diabetes, breast cancer, and ovarian cancer (Ip et al., 2007).

Mothers with epilepsy (MWE), especially those taking antiepileptic drugs (AEDs), have to balance the benefits of breastfeeding with the potential adverse effects of drug exposure to infants via breast milk. Considering that the central nervous system is still developing in the postnatal period and the blood-brain barrier is not fully developed until almost six months after birth, the brain is vulnerable to toxic substances during this period (Rodier, 1995).Theoretically long-term exposure to AEDs ingested by breast milk of MWE may harm infants, however there is increasing evidence that this is not the case (Meador et al., 2010; Meador et al., 2014).

The amount of AEDs ingested by infants from breast milk is significantly lower than the amount due to in utero exposure, and serum concentrations of AEDs in breastfed infants are reported to be well

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below the pharmacological effective level (Tomson et al., 2007; Veiby et al., 2015).Adverse effects are rarely reported in breastfed babies of mothers who are receiving AEDs. Furthermore, a prospective cohort study showed that continuously breastfed infants of mothers taking AEDs therapies have less impaired development at 6 or 18 months than infants whose mothers failed to breastfeed or discontinued breastfeeding (Veiby et al., 2013). In another prospective multicenter study (Meador et al., 2014) higher IQ and better verbal abilities at age 6 years have been observed in breastfed children of mothers taking AEDs. As a result, it has been suggested that MWE should be encouraged to breastfeed their babies if possible (Mintzer, 2011; Tomson and Battino, 2009).

Despite the importance of the issue, there is currently little published research examining the breastfeeding decisions made by MWE, and factors influencing these decisions, particularly in developing countries. The present study aimed to characterize the rates of breastfeeding in Chinese MWE, as well as the common reasons for not breastfeeding or early weaning, and to identify associations with sociodemographic and clinical factors.

2. Material and methods

2.1. Subjects and procedures

This hospital-based survey was conducted in Chengdu, a metropolis with a population of more than 14 million, in South-West China. Data about breastfeeding in MWE were collected from three hospitals, viz two general hospitals and one specialist women and children's hospital. From February 2014 to July 2015, women were invited to take part in this retro-prospective survey if they met the following eligibility criteria: 1) with a definitive diagnosis of epilepsy, 2) giving birth to a baby after the onset epilepsy, and 3) having a baby younger than 24 months. Participating women could be further divided into three groups: 1) truly prospective- enrolled *prior to the delivery*, 2) prospective- enrolled *after delivery but prior to six months postpartum*, 3) retrospective- enrolled *after six months postpartum but prior to two years postpartum*. Patients with severe psychiatric history or those who were unable to provide consent were excluded from this survey.

The study was approved by the ethics committee of West China Hospital of Sichuan University. Sample size for estimating a population proportion of breastfeeding was calculated by using data from a preliminary experiment, where the estimated breastfeeding proportion was 80%, with 5% margin of error and 95% confidence interval. Staff collecting data were trained in the administration of the questionnaire and had at least a basic knowledge of breastfeeding. To help maintain the objectivity of research, data collectors were not allowed to give any suggestions on breastfeeding to the participants. Each subject was required to give written informed consent for their participation before the interview. After this, all subjects completed a semi-structured questionnaire, which took less than 15 min. The prospectively enrolled women would be followed up by telephone at three and six months after delivery if applicable. The informed consent forms and questionnaires were stored separately for protection of privacy.

2.2. Questionnaire

Breastfeeding information, selected sociodemographic and clinical factors of the participants were collected in a semi-structured questionnaire, which included maternal sociodemographic and obstetric factors namely age, level of education, residence, reproductive history and mode of delivery. Clinical factors collected included seizure types, duration of epilepsy, AED therapy and seizure control. Information about breastfeeding implementation was acquired from three aspects: initiation, duration and exclusivity of breastfeeding. In addition, the reasons for weaning babies younger than six months were also collected.

Categories for assessing infant feeding practices were set according to definitions from the World Health Organization (WHO, 2007). Exclusive breastfeeding was defined as infants receiving no other food or drink except breast milk, with the exception of oral rehydration salts, drops and syrups for gastroenteritis illnesses. The initiation of breastfeeding was defined when an infant had ever been fed with breast milk (including milk expressed or from a nursing mother). A premature delivery was defined as a gestation period of less than 37 weeks. The perinatal period was defined as the duration from gestation of 28 weeks to 7 days after delivery. Regarding gestational seizure control, 'newly diagnosed' included participants having their first seizure during pregnancy; 'active' included those who had experienced at least one seizure in the past year and excluded those 'newly diagnosed'; 'stable' included those who didn't have a seizure in the past year; 'AEDs withdrawn' included participants who had prolonged seizure remission and discontinued AEDs prior to pregnancy.

2.3. Statistical analysis

The SPSS software package (version 17.0, SPSS Inc., Chicago, Illinois, USA) was used for statistical analyses. Data were double-entered into SPSS, and descriptive analysis was applied to dispose sociodemographic, epileptic clinical, and breastfeeding data, expressing results as percentages, mean, and standard deviation (SD). Univariate and multivariate logistic regression were performed to select significant influential factors. To adjust for overfitting, penalized maximum likelihood estimation (PMLE)(Moons et al., 2004) was applied to fit the selected multivariate logistic regression model. Results were shown as odds ratios (ORs) and 95% confidence intervals (95% CIs). A variable was considered to be statistically significant when its two-tailed p value was less than 0.05 ($p < 0.05$).

3. Results

3.1. Sociodemographic and clinical characteristics

Out of 476 females with epilepsy who had a childbearing history, 101 gave birth to a baby before they had experienced any seizures, 89 women had children who were older than 24 months and five eligible women rejected participation. Finally 281 women met our eligibility criteria and agreed to participate in this survey. Among them, 83 were enrolled retrospectively, 107 were prospectively, and 91 were truly prospectively enrolled. All the participants who provided a written informed consent completed the questionnaire on site or were successfully followed up. Sociodemographic and clinical characteristics of these patients are summarized in Table 1.

Median follow-up time was 4.7 months. The average maternal age was 25.8(± 4.3)years, with minimum and maximum age being 17 and 40 years respectively. Of these participants, 89.3% had full term deliveries, 73.0% had a cesarean delivery, and 62.3% had suffered from epilepsy for more than 10 years. More than two thirds experienced at least one seizure during year before delivery.

3.2. Breastfeeding behaviors

Basic information of breastfeeding status is presented in Table 2. Breastfeeding initiation rate among participating MWE was 59.4%. Reasons for MWE weaning their babies younger than six months are presented in Table 3. Fear of the adverse effects of drugs on the babies via breastfeeding, and frequent epileptic seizures during the period of lactation were the commonest reasons.

3.3. Factors associated with breastfeeding

The correlation between selected factors and breastfeeding behaviors in MWE are presented in Table 4(univariate analysis) and Table 5