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Early life factors associated with the exclusivity and duration of breast feeding in an Irish birth cohort study

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ABSTRACT

Objective: to investigate the influence of parental and infant characteristics on exclusive breast feeding from birth to six months of age and breast feeding rates at two, six and 12 months of age in Ireland.
Methodology: secondary data analysis from the Cork BASELINE Birth Cohort Study (http://www.baselinestudy.net/). Infants were seen at birth and two, six, and 12 months of age. Maternal and paternal history, neonatal course and feeding data were collected at birth and using parental questionnaires at each time point.
Participants: 1094 singleton infants of primiparous women recruited at 20 weeks' gestation who were breastfeeding on discharge from the maternity hospital.
Findings: at discharge from the maternity hospital and at two months, neonatal intensive-care unit admission had the strongest influence on exclusive breast feeding status (adjusted OR 0.17, 95% CI 0.07–0.41 at discharge) and at two months (adjusted OR=0.20, 95% CI 0.05–0.83). A shorter duration of breast feeding was significantly associated with younger maternal age, non-tertiary education, Irish nationality and neonatal intensive-care unit admission. There was a significant difference in the duration of any breast feeding between infants who were and were not admitted to the neonatal intensive-care unit, 28(10.50, 32) weeks versus 32(27, 40) weeks. Mothers whose maternity leave was between seven and 12 months (adjusted OR=2.76, 95% CI 1.51–5.05) breast fed for a longer duration compared to mothers who had less than six months of maternity leave.
Key conclusions: admission to the neonatal intensive care unit negatively influenced both exclusivity and duration of breast feeding. Length of maternity leave, and not employment status, was significantly associated with duration of breast feeding.
Implications for practice: additional support may be required to ensure continued breast feeding in infants admitted to the neonatal intensive-care unit. Length of maternity leave is a modifiable influence on breast feeding and offers the opportunity for intervention to improve our rates of breast feeding.

Introduction

In 2003 Ireland adopted the World Health Organization (WHO) recommendations for exclusive breast feeding in the first six months of life (Department of Health & Children, 2003). Recently there has been an increase in breast feeding initiation rates in Irish maternity hospitals (Health Research and Information Division, 2013) but this has not translated into increased duration of breast

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feeding for either "exclusive" or "any" breast feeding. Ireland continues to have one of the lowest breast feeding rates internationally (The Economic and Social Research Institute, 2012).

Breast feeding is an intricate health behaviour and studies have shown that the reasons and influences for mothers to breast feed are multifactorial and complex. Empirical research has found postnatal depression, anxiety, social/paternal support to be among factors influencing the duration of exclusive breast feeding. Overall, maternal self-efficacy was the most reported psychosocial factor and it was found to be the most effective in influencing exclusive breast feeding duration (De Jager et al., 2013).

Internationally, demographic factors, such as maternal age, smoking, employment and education level, marital status and household income have all been found to significantly influence breast feeding duration (Dennis et al., 2013). There is limited research focusing on the predictors of exclusive breast feeding and studies that have examined exclusive breast feeding have found conflicting results (Dubois and Girard, 2003; Scott et al., 2006; Chudasama et al., 2008; Kristiansen et al., 2010; Jones et al., 2011; Tan, 2011; De Jager et al., 2013; Dennis et al., 2013; Vieira et al., 2014).

Hospital practices have also been shown to influence breast feeding rates (Giovannini et al., 2005; Merten et al., 2005). The critical role that maternity services provide in promoting and supporting breast feeding has been recognised internationally (World Health Organization and UNICEF, 1989). In 1991 the WHO and UNICEF developed the Baby Friendly Hospital Initiative (BFHI) in an effort to promote best breast feeding practices in hospitals to protect and strengthen breast feeding rates (World Health Organization, 1998).

Studies specific to the Irish breast feeding population have examined which factors are associated with any breast feeding (Tarrant et al., 2011b; Leahy-Warren et al., 2014) but not exclusive and few have descriptively described which mothers were exclusively breast feeding (Belgley et al., 2008; Williams et al., 2010).

We wished to examine the early life factors which affected duration of breast feeding and exclusivity of breast feeding in a prospective maternal-infant cohort.

Methods

Design and setting

The Cork BASELINE Birth Cohort Study (www.baselinestudy.net/) is a longitudinal birth cohort study following singleton infants of low-risk primigravida mothers who participated in the SCOPE Ireland Study (www.scopestudy.net). Participants were recruited, between 2008 and 2011, at 20 weeks' gestation from the SCOPE Ireland Study. Details of the Cork BASELINE Birth Cohort Study have been previously reported (O'Donovan et al., 2014).

All infants were born in a single large maternity hospital, which has a BFHI certificate of membership. A certificate of membership is awarded to hospitals that are participating in the initiative but do not yet meet the criteria for BFHI accreditation. Infants were returned to a separate research suite for study visits at two, six, and 12 months of age. Infants who were born preterm ($\leq 36^{+6}$ gestational weeks) were seen at their corrected age for each of the appointments. Each assessment involved face-to-face questionnaires and growth measurements. If mothers were unable to attend a study visit they were offered a telephone interview.

Data collection

The clinical research ethics committee of the Cork Teaching Hospitals provided ethical approval for both the SCOPE Ireland Study (ref ECM5(10) 05/02/08) and the Cork BASELINE Birth Cohort Study (ref ECM5(9) 01/07/2008).

Maternal and paternal body mass index (BMI) was measured at 15 ± 1 weeks' gestation. Maternal and paternal BMI groups were classified as per WHO guidelines (World Health Organization, 2006). Mothers were screened for gestational diabetes as per the local maternity unit guidelines. Pre-existing diabetes was an exclusion criterion for the SCOPE Ireland Study.

Information on intrapartum (mode of childbirth, infant sex, birth weight & gestational age at childbirth) and neonatal (method of feeding, length of stay in the maternity hospital and if applicable: admission to neonatal intensive-care unit (NICU), reason for admission to NICU and length of stay in the NICU) events were collected from the maternity records, prospectively, by a single research midwife. Gestational age at childbirth was classified as preterm ($\leq 36^{+6}$gestational weeks) or term ($\geq 37^{+0}$gestational weeks).

Demographic details (marital status, tertiary education, employment status and job title, household income, maternal and paternal nationality, maternal date of birth and type of maternity care) and smoking status during pregnancy were collected at two months. Socio-economic status (SES) was determined using the Irish Central Statistical Office (CSO) guidelines (Central Statistics Office, 2006). The age (months) of infant when the mother returned to work was collected at both the six and 12 months of age appointments.

Infants were categorised as exclusively breast fed per WHO definitions if they received breast-milk only (with the exception of medicines, vitamins, minerals and oral rehydration solution). Partial breast feeding included infants who had received any artificial feeds and/or solid food (World Health Organization, 2001).

Statistical analyses

Anonymised data were entered prospectively into a password protected internet database. For analysis, data were transferred to IBM SPSS Statistics 20 (IBM Corp., Armonk, NY). Continuous variables are shown as mean (SD), unless otherwise stated, and categorical variables are presented as numbers and percentages. Statistical significance was achieved for p values ≤ 0.05.

Descriptive analysis was undertaken to determine the prevalence of exclusive breast feeding and rates of breast feeding at each time point. χ^2 test examined for associations between maternal, paternal and infant characteristics with exclusive breast feeding at discharge from the maternity hospital and at two and six months of age and breast feeding rates at each of the study visits in the first year of life (two, six and 12 months of age). Breast feeding duration was tested using Mann–Whitney test when examining between two categories and Kruskal–Wallis test was employed when investigating across three or more categories. Breast feeding duration is presented as median (25th and 75th percentile).

Significant factors, identified through univariate analysis, were entered into logistic regression models to assess for the adjusted odds ratio (adjusted OR) for exclusive breast feeding at discharge from the maternity hospital and at two and six months and on breast feeding rates at two, six and 12 months of age.

Findings

At 20 weeks' gestation 1537 mothers consented for their child to participate in the Cork BASELINE Birth Cohort Study and 1094 (71.18%) were exclusively or partially breast feeding their infant on discharge from the maternity hospital. The response rate of breast-feeding mothers at two, six and 12 months was 999 (91.3%), 966 (88.3%) and 909 (83.1%), respectively. In total, 874 (79.9%) of

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