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CLINICAL ARTICLE

A longitudinal study of unplanned pregnancy in a maternity hospital setting

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ABSTRACT

Objective: To review family planning in a cohort of women who delivered a second child within 3 years of their first. *Methods:* A longitudinal, observational study included women aged at least 18 years who had delivered a singleton weighing at least 500 g in 2009 after their first pregnancy at a hospital in Dublin, Ireland, and who returned to the hospital for prenatal care for a second pregnancy before January 2012. Logistic regression analyses were performed to examine the effect of maternal characteristics on pregnancy intention. *Results:* Of 3284 primigravidas who delivered in 2009, 1220 (37.1%) returned with a second pregnancy. The second pregnancy was unplanned in 248 (20.3%) women, and both pregnancies were unplanned in 124 (10.2%). The second pregnancy was more likely to be unplanned in women whose first pregnancy was also unplanned than in those whose first was planned (adjusted odds ratio 6.5; 95% confidence interval 4.6–8.4; $P < 0.001$). Among the 99 women with recurrent unplanned pregnancy who had not been using contraception before the first pregnancy, 85 (85.9%) were also not using contraception before the second. *Conclusion:* Women whose first pregnancy is unplanned are at increased risk of subsequent unplanned pregnancies. Postnatal contraceptive advice in this high-risk group should be prioritized.

1. Introduction

About half of pregnancies in high-income countries are unplanned [1,2]. Despite concerted efforts to reduce the number of unplanned pregnancies, it remains high in high-income countries, including the USA [1–4]. An unplanned pregnancy poses challenges for both the woman and her family, and has been associated with substantial increases in healthcare costs [3,5]. For some women, it may precipitate a personal crisis and they might decide to have the pregnancy terminated. For women who choose to continue with their pregnancy, the lack of planning could compromise prepregnancy and prenatal care. For example, they could miss the opportunity to improve their diet or weight, take nutritional supplements, stop smoking, or be vaccinated. Additionally, they might present late for prenatal care.

Similarly, a woman's interpregnancy interval (IPI) can be shortened as a result of unplanned pregnancy, which may limit interpregnancy health optimization. Although both short and long IPIs can be intentional, several studies have associated IPIs with the incidence of congenital defects and adverse perinatal outcomes [6–9]. An IPI of less than 6 months is generally acknowledged as too short because it confers an increased risk for congenital anomalies, preterm birth, low birth weight, small-for-gestational-age newborns, stillbirth, and early neonatal death [6,7,9]. Perinatal risks increase consistently after an IPI of 24 months [6–9]. The optimal IPI seems to be 18–24 months—the window of lowest perinatal risk [9].

Epidemiological studies [2,3] have reported associations between unplanned pregnancy and sociodemographic variables such as age, educational attainment, ethnic origin, income, relationship status, parity, and religious beliefs. These factors could also affect the outcomes of unplanned pregnancies. However, epidemiological studies of pregnancy intention are usually cross-sectional; few longitudinal studies are available [10,11]. The aim of the present study was to review family planning intentions in a cohort of women who delivered a second child within 3 years of their first.

2. Materials and methods

A longitudinal, observational study was undertaken at the Coombe Women and Infants University Hospital, Dublin, Ireland—a large university maternity hospital with approximately 9000 deliveries every year [12]. Women from all socioeconomic groups attend this hospital from both rural and urban areas. Women aged at least 18 years were eligible for inclusion in the present study when they had delivered a singleton weighing at least 500 g in 2009 after their first pregnancy, and returned to the hospital for prenatal care for a second pregnancy before January 1, 2012. It is hospital policy to offer all women a dating scan in early pregnancy before they book for prenatal care. The obstetric records,

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including the delivery details, are computerized for subsequent analysis and annual audit [12]. Informed consent was unnecessary because the present study was an internal anonymous clinical audit. Approval from the hospital's research ethics committee was not necessary; a waiver was obtained from its chairman.

As part of routine Hospital care, a history is taken by a trained midwife at a woman's first prenatal visit and the details computerized. Women are asked whether their pregnancy was planned or not taking into consideration their age, previous pregnancies, and timing in relation to their personal life and career. They are also asked if they had required any fertility treatment. Information on family planning methods and failure is also collected. Women are asked if they had been using contraception when they became pregnant—i.e. if contraception had failed—and if so, what type. For the present study, the type of contraception was grouped as non-hormonal (barrier, tubal ligation, and rhythm/abstinence) or hormonal (hormonal oral contraceptives [combined or progesterone only], emergency contraceptive pill, combined transdermal patch, etonogestrel implant, combined vaginal ring, levonorgestrel intrauterine contraceptive system, or intrauterine device).

In addition to pregnancy intention and family planning, the following maternal characteristics at the first prenatal visit were extracted from the electronic records: maternal age; measured height, weight and body mass index (BMI); place of birth; and maternal occupation. Maternal BMI was classified according to the WHO categorization. The women's self-described occupation was used to categorize socioeconomic groups as professional/managerial, other non-manual or skilled manual, semi-skilled or unskilled manual, and unemployed. Place of birth was recorded as Ireland, the EU14 (the 14 countries that formed the European Union [EU] before 2004), the EU13 (the 13 countries that joined the EU after enlargement in 2004), or elsewhere (women born outside the EU).

The present analyses were performed using SPSS version 20.0.0 (IBM, Armonk, NY, USA). Descriptive statistics were used to characterize the participants by category of pregnancy intention. Logistic regression analyses were performed to examine the effect of maternal characteristics on recurrent unplanned pregnancy. The regression model contained maternal age, BMI category, nationality, socioeconomic group, and previous unplanned pregnancy. The dependent variable was recurrent unplanned pregnancy. The Enter method was used. Results are reported as proportions, odds ratios (ORs), and 95% confidence intervals (CI). $P < 0.05$ was considered statistically significant. The χ^2 test was used to calculate P values according to sample size, and the independent sample t test was used to compare means.

3. Results

Overall, 3284 primigravidas delivered in 2009, of whom 1087 (33.1%) reported that the pregnancy was unplanned. Table 1 shows the characteristics of the primigravidas. A total of 1220 (37.1%) returned to the hospital for prenatal care before January 1, 2012. Table 2 shows their characteristics. The mean interval from delivery to repeat prenatal booking was 570 ± 236 days. Among the 1220 who returned, 248 (20.3%) did not plan their second pregnancy and 124 (10.2%) had not planned either pregnancy. Table 3 shows the characteristics of women with recurrent planned pregnancies and of those with recurrent unplanned pregnancies.

The second pregnancy was planned in most women whose first pregnancy had also been planned (Table 4). The odds of the second pregnancy being unplanned were over four times higher among women who did not plan their first pregnancy than among those who had planned their first pregnancy (unadjusted OR 7.3; 95% CI 5.3–10.0; $P < 0.001$). This association persisted after controlling for age, country of birth, and socioeconomic group (adjusted OR 6.5; 95% CI 4.6–8.4; $P < 0.001$).

Of the 1087 women who delivered in 2009 after an unplanned first pregnancy, most reported that they had been using no form of contraception at the time of conception (Table 5). Similarly, most of the 248 women who reattended with an unplanned pregnancy had been using no form of contraception (Table 5). Among the 124 women with recurrent unplanned pregnancy, most of those who had been using no contraception before the first pregnancy had also not been using any contraception before the second pregnancy (Table 6). Recurrent contraception failure was reported by 12 (9.7%) of the 124 women with recurrent unplanned pregnancy (Table 6).

Table 1
Characteristics and pregnancy outcomes among primigravidas who delivered in 2009.[a]

Characteristics/outcomes	Total (n = 3284)	Planned pregnancy (n = 2197)	Unplanned pregnancy (n = 1087)	*P* value[b]
Age, y	28.2 ± 5.6	29.0 ± 5.4	26.7 ± 5.4	<0.001
Body mass index[c]	24.5 ± 4.5	24.6 ± 4.5	24.3 ± 4.5	0.153
Obese[d]	371 (11.3)	237 (10.8)	133 (12.2)	0.231
Present smoker	286 (8.7)	156 (7.1)	133 (12.2)	<0.001
Unemployed	289 (8.8)	110 (5.0)	185 (17.0)	<0.001
Born in Ireland	2319 (70.6)	1547 (70.4)	770 (70.8)	0.900
Gestational age at delivery, wk	39.3 ± 2.0	39.3 ± 2.0	39.3 ± 2.0	0.713
Birth weight <2.5 kg	164 (5.0)	103 (4.7)	60 (5.5)	0.310
Birth weight >4.5 kg	53 (1.6)	40 (1.8)	14 (1.3)	0.300
Cesarean delivery	831 (25.3)	545 (24.8)	277 (25.5)	0.701

[a] Values are given as mean ± SD or number (percentage), unless indicated otherwise.
[b] Comparing planned pregnancies with unplanned pregnancies.
[c] Calculated as weight in kilograms divided by the square of height in meters.
[d] Body mass index >29.9.

Table 2
Characteristics and pregnancy outcomes among women who returned for prenatal care before January 1, 2012.[a]

Characteristics/outcomes	Total (n = 1220)	Planned pregnancy (n = 972)	Unplanned pregnancy (n = 248)	*P* value[b]
Age, y	28.2 ± 5.6	31.6 ± 4.9	30.3 ± 5.3	<0.001
Body mass index[c]	24.5 ± 4.5	25.4 ± 4.5	25.3 ± 5.1	0.800
Obese[d]	176 (14.4)	137 (14.1)	39 (15.7)	0.523
Present smoker	104 (8.5)	70 (7.2)	34 (13.7)	0.001
Unemployed	139 (11.4)	68 (7.0)	55 (22.2)	<0.001
Born in Ireland	864 (70.8)	676 (69.5)	176 (71.0)	0.702
Gestational age at delivery, wk	39.1 ± 2.0	39.1 ± 2.0	39.1 ± 2.0	0.700
Birth weight <2.5 kg	34 (2.8)	24 (2.5)	10 (4.0)	0.150
Birth weight >4.5 kg	24 (2.0)	23 (2.4)	2 (0.8)	0.803
Cesarean delivery	268 (22.0)	221 (22.7)	47 (19.0)	0.210

[a] Values are given as mean ± SD or number (percentage), unless indicated otherwise.
[b] Comparing planned pregnancies with unplanned pregnancies.
[c] Calculated as weight in kilograms divided by the square of height in meters.
[d] Body mass index >29.9.

Table 3
Characteristics and pregnancy outcomes of women who reported recurrent unplanned pregnancies.[a]

Characteristics/outcomes	Recurrent planned pregnancies (n = 855)	Recurrent unplanned pregnancies (n = 124)	*P* value[b]
Age, y	30.0 ± 5.3	27.8 ± 5.1	<0.001
Body mass index[c]	24.6 ± 5.1	24.2 ± 4.8	0.212
Obese[d]	93 (10.9)	15 (12.1)	0.731
Present smoker	59 (6.9)	20 (16.1)	<0.001
Unemployed	41 (4.8)	35 (28.2)	<0.001
Born in Ireland	593 (69.4)	92 (74.2)	0.300
Gestational age at delivery, wk	39.4 ± 2.0	39.5 ± 2.0	0.810
Birth weight <2.5 kg	36 (4.2)	5 (4.0)	0.902
Birth weight >4.5 kg	22 (2.6)	2 (1.6)	0.300
Cesarean delivery	221 (25.8)	28 (22.6)	0.411

[a] Values are given as mean ± SD or number (percentage), unless indicated otherwise.
[b] Comparing planned pregnancies with unplanned pregnancies.
[c] Calculated as weight in kilograms divided by the square of height in meters.
[d] Body mass index >29.9.