



Do demographic and socio-economic characteristics of women with epilepsy influence contact with joint obstetric/neurology services in Northern Ireland?



Women with epilepsy and joint obstetric/neurology services

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ABSTRACT

Purpose: Care of pregnant women with epilepsy (WWE) should be shared between an epilepsy specialist and obstetrician. Joint care is provided by the regional, but not peripheral, maternity units in Northern Ireland (NI). We investigated whether demographic and socio-economic factors influenced access of joint obstetric/neurology services.

Method: Data on WWE delivering between 1st January 2012 and 31st December 2014 were collected. Demographic (age, parity, Trust residence) and socio-economic (employment status, deprivation level) factors were compared between three groups: (1) women delivering at the regional unit from its catchment, (2) women delivering at the regional unit from outside its catchment and (3) women delivering at peripheral units.

Results: 447 WWE delivered in the 3-year period. 48% (214/447) and 52% (233/447) delivered at regional and peripheral units respectively. 42% delivering at the regional unit were from its catchment and 58% outside. There was no difference in parity, employment status or deprivation of WWE from outside the regional unit catchment who accessed joint services and those who did not. Trust residence was the strongest predictor of delivery location with women from adjacent Trusts over 90% less likely to deliver at peripheral units. Maternal age was also a predictor of delivery location with a woman aged 30 being 50% less likely to deliver at a peripheral unit than one aged 20.

Conclusions: 52% of all WWE and 63% outside the regional unit catchment do not access the joint service. Service models which deliver improved access should focus on those in geographically distant locations and of younger age.

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1. Introduction

Epilepsy is the most common serious neurological disorder in the UK with an estimated prevalence of between 0.7 and 0.8% [1,2]. The incidence is about 0.05% (50 per 1,000,000 population) per year [2] with incidence rates peaking in childhood and older age. Approximately 23% of people with epilepsy are women of child bearing age [3]. A population based study estimated that 0.33% of pregnancies involve active maternal epilepsy [4].

It is recommended that care of pregnant women with epilepsy should be shared between an epilepsy specialist and an obstetrician

and that a liaison epilepsy nurse is an integral part of routine antenatal service [5]. These elements are provided by the regional maternity unit in Northern Ireland which delivers a joint obstetric/neurology antenatal clinic and epilepsy nurse specialist (ENS) service to all women with epilepsy resident in the regional maternity unit catchment area and to those referred from peripheral units. Antenatal care for women with epilepsy varies across peripheral maternity units in Northern Ireland with no standardised referral criteria to the regional joint obstetric/neurology antenatal service. Consequently although joint obstetric and neurological care of women with epilepsy during pregnancy is recommended, delivery of this service is variable in Northern Ireland. Differences in characteristics of women with epilepsy accessing antenatal services may help inform the design of a regional antenatal care pathway for women with epilepsy in Northern Ireland.

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This study seeks to:

- (1) Describe demographic and socio-economic characteristics of women with epilepsy who deliver in Northern Ireland and investigate differences in these characteristics between those who deliver in regional and peripheral maternity units.
- (2) Determine if there are differences in demographic and socio-economic characteristics between women resident outside the regional unit catchment area who deliver in the regional unit and those who deliver in peripheral units.
- (3) Determine independent predictors of delivery location and access to the joint obstetric/neurological service for women who reside outside the regional unit's catchment area.

2. Methods

Data was extracted from the Northern Ireland Maternity Information System (NIMATS) relating to all births in which the mother had a recorded diagnosis of epilepsy for the 3-year period from 1st January 2012 to 31st December 2014. Twin and higher multiple births were identified and data relating to the first born live child was used to ensure only a single record for each mother was used. Only data for those with a diagnosis of non-resolved epilepsy were considered for analysis. Epilepsy was considered resolved in those who were seizure-free for the last 10 years and off AEDs for at least 5 years or those with an age dependent epilepsy syndrome who were past the applicable age [6].

Demographic and socio-economic factors were compared between three groups: (1) women who delivered at the regional unit from its catchment area, (2) women who delivered at the regional unit from outside its catchment area and (3) women who delivered at peripheral units (Fig. 1). Employment status was classified as employed, unemployed, stay at home mother or student. Deprivation level was determined based on the census output area of the patient's home address, using the Northern Ireland Multiple Deprivation Measure (NIMDM) which is a composite deprivation measure with components of income, employment, health and disability, education, skills and training,

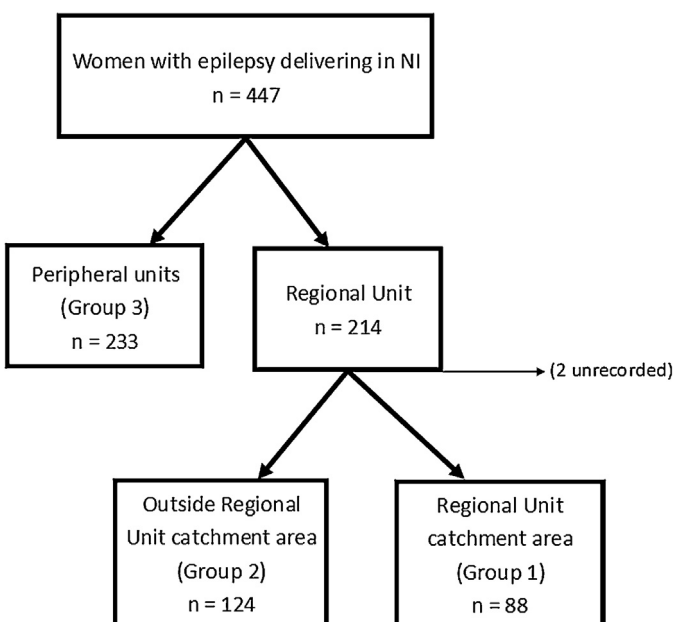


Fig. 1. Schematic of delivery location of women with epilepsy in Northern Ireland (NI) and groups used for statistical analysis (Groups 1–3).

proximity to services, living environment and crime and disorder (17). Patients were assigned to deprivation quintiles according to their postcode, ranging from quintile 1 (most deprived) to quintile 5 (least deprived). Parity was categorised as nulliparous, one delivery, two deliveries, three to four deliveries and five or more deliveries.

2.1. Statistical analysis

Categorical variables (employment status, deprivation quintile and parity) were analysed using chi-squared tests. Continuous variables were plotted and assessed for normal distribution. Continuous variables that were normally distributed (maternal age and birth weight) were analysed using *t*-tests and those that were not normally distributed (antenatal, maternal and infant length of stay) were analysed using the Mann–Whitney *U* test. To investigate factors associated with delivery location and contact with the joint neurology/obstetric service, data from women resident outside the regional unit catchment area were analysed (Groups 2 and 3, Fig. 1). A multivariate logistic regression model was used to assess the association of demographic and socio-economic factors on delivery location with the outcome being either delivery in the regional or a peripheral unit. The predictor variables were maternal age at delivery, parity, employment status, deprivation level and Trust residence. A *p*-value of <0.05 was considered significant. Analysis was performed using SPSS version 19.0 (IBM Corp, Armonk, NY).

3. Results

447 women with non-resolved epilepsy delivered in Northern Ireland hospitals between 1st January 2012 and 31st December 2014. 180 women delivered in 2012 and 134 and 133 in 2013 and 2014 respectively (Table 1). 48% (214/447) delivered at the regional maternity unit and 52% (233/447) delivered in peripheral maternity units (Fig. 1, Table 1). Of those delivering at the regional maternity unit, 42% were residents of the regional unit's catchment area and 58% were residents from outside the catchment area (Table 2). Of the 124 women delivering at the regional unit from outside its catchment area, 82% were from the two adjoining catchment areas (South Eastern (44%) and Northern Trust (38%)) with only 18% from non-adjoining catchment areas (Southern (13%) and Western Trusts (5%)) (Table 3).

3.1. Demographic, socio-economic factors and parity

There was no difference between maternal age at delivery between women from the regional unit catchment area (29.3 years (standard deviation (SD) = 5.6) and those from outside the regional unit catchment areas who delivered at the regional unit (30.3 years (SD = 5.3), *p* = 0.19) and women who delivered at peripheral units (29.6 years (SD = 5.8), *p* = 0.70). There was no difference in maternal age at birth between women outside the regional unit catchment area delivering at the regional unit and women who delivered at peripheral units (*p* = 0.25).

Table 1
Women with epilepsy delivering by regional and peripheral units, 2011–2014.

	Number	Regional unit [Number (%)]	Peripheral units [Number (%)]
2012	180	82 (46%)	98 (54%)
2013	134	69 (51%)	65 (49%)
2014	133	63 (47%)	70 (53%)
Total	447	214 (48%)	233 (52%)

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