

Estimating the cost of pre-eclampsia in the health system: a cross-sectional analysis using data from the Screening for Pregnancy Endpoints (SCOPE) study.

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BACKGROUND

Pre-Eclampsia is a pregnancy specific condition characterised by a significant rise in blood pressure (>140/90mmHg) and new onset protein in the urine (>300mg in 24 hours) after 20 weeks gestation (1).

It accounts for 12% of maternal deaths per year globally (1), affecting 2-3% of all Irish pregnancies (2). For the mother it can lead to the development of long term morbidities, and increases the risk of future hospitalisation. Furthermore it can impact infant development by increasing the risk of preterm birth and low birth-weight (3).

As the only treatment for pre-eclampsia is delivery requiring increased monitoring during pregnancy, pre-eclampsia has been associated with increased health service use. One of the only studies which examined such impact of pre-eclampsia on health care costs was carried out in Ontario, Canada 2009. Pre-eclampsia accounted for an additional cost of CAD\$3.1 million annually, associated with increased cesarean sections performed, and long term care for low birthweight infants born to women with pre-eclampsia (4). To date there is no such study in Ireland, either accounting for the cost of pre-eclampsia, or a detailed account of health service use in this high risk group.

Aim:

The purpose of this study was to examine the health service use of women with pre-eclampsia and those without pre-eclampsia in Ireland.

METHODS

Design

Cross-sectional analysis of data from women in Ireland who participated in the Screening for Pregnancy Endpoints study (SCOPE). The SCOPE study is a prospective international multi-centred study of 'healthy' nulliparous women which aims to provide a database of information on all clinical risk factors for preterm birth related to pre-eclampsia, small for gestational age (SGA) infants and spontaneous pre-term birth (SPTB) (2).

Population

SCOPE participants were healthy nulliparous women with singleton pregnancies recruited between March 2008 and February 2011 in Cork Ireland (n=1774). All women who agreed to take part were seen at 14-16 weeks and 19-21 weeks gestation when they completed an extensive questionnaire and underwent detailed physical assessment by trained research midwives.

Sample

Women with preeclampsia (n=68) and a 10% random sample of women without pre-eclampsia (n=171) selected from SCOPE Ireland dataset.

Data Collection

Retrospective data on health service use were extracted from participants' medical records (carried out between August 2014 and June 2015). This information was then merged with the existing SCOPE dataset which contained socio-demographic and clinical information on participants.

Data Management and Analysis

Data gathered included both sociodemographics of the participants and health service use. Health service use data was divided into three terms: antenatal, perinatal, and 12 months postnatal (Figure 1).

Figure 1. Health service use data extracted from SCOPE dataset (S) and Medical Records (M)

Antenatal	Perinatal	Postnatal (12 months post-delivery)
Medical Records (M) SCOPE dataset (S)	Medical Records (M) SCOPE dataset (S)	Medical Records (M) SCOPE dataset (S)
Number of Outpatient Department Visits (M)	Mode of Delivery (S)	Number of Outpatient hospital Visits (M)
Number of Hospital Admissions (M)	Epidural (S)	Number of Inpatient hospital Admissions (M)
Length of Stay of Inpatient Hospital Admissions (M)	Episiotomy (S)	Length of Stay of Inpatient Admissions (M)
Number of Foetal Assessment Unit Visits (M)	Level of tear (S)	Infant Admission to Neonatal Intensive Care Unit post-delivery (S)
Number of Antenatal Scans (M)	Length of Hospital Stay Post-Delivery (M)	

Health service use variables were analysed using STATA.

RESULTS

Participants

- 39% of women with pre-eclampsia were aged between 30-34 years (n=26, 95% CI=26-50%).
- 25% of women with pre-eclampsia had a shorter gestational period of less than 37 weeks (n=17, 95% CI=14-36%), compared to 5% of women without pre-eclampsia (n=9, 95% CI=2-9%).
- 21% of women with pre-eclampsia were categorised as obese (n=14, 95% CI=11-30%) yet only 12% of women without pre-eclampsia fell into the obese category (n=20, 95% CI=7-17%).
- In both groups 76% of participants were cared for in the public health system.

Table 2. Sociodemographics and health status characteristics of participants

	Pre-Eclampsia			No Pre-Eclampsia		
	(n=68)	%	(95% CI)	(n=171)	%	(95% CI)
Maternal Age (years)						
<20	0	0		1	1 (-1-17)	
20-24	8	11 (4-20)		14	8 (4-12)	
25-29	21	31 (20-42)		57	33 (26-41)	
30-34	26	39 (26-50)		79	46 (39-58)	
35-39	13	19 (10-29)		17	10 (5-14)	
40+	0	0		3	2(-0.2-4)	
Healthcare Cover						
Public	52	76(66-87)		130	76 (70-83)	
Private	16	23 (13-34)		41	24 (18-30)	
Gestational Age (weeks)						
<37	17	25(14-36)		9	5 (2-9)	
37-39	20	29 (18-41)		28	16 (11-22)	
39-41	28	4 (29-53)		97	57 (49-64)	
>41	3	4(-.06-9)		37	22 (15-28)	
BMI (at 15w)						
Underweight (≤18.5)	0	0		2	1(-0.5-3)	
Normal (>18.5-<25)	28	41 (29-53)		96	56 (49-64)	
Overweight (≥25-<30)	26	38 (26-50)		53	31 (24-38)	
Obese(≥30)	14	21(11-30)		20	12(7-17)	
Smoking (at 20w)						
Yes	5	7(01-14)		18	11 (60-16)	
No	62	93 (86-99)		149	89 (84-94)	

Health Service Use

Antenatal Health Service Use

- 30% of women with pre-eclampsia had one inpatient admission, more than double the 13% of women without pre-eclampsia.
- 12% of women with pre-eclampsia had two inpatient admissions in the antenatal period compared to 2% of women without pre-eclampsia.
- The average length of stay for women with pre-eclampsia was 4 days, whereas for women without pre-eclampsia the average length of stay was 3.6 days.

Perinatal Health Service Use

- Only 25% of women with pre-eclampsia delivered via spontaneous birth (n=25, 95% CI=14-36%) compared to 54% of women without pre-eclampsia (n=33, 95% CI= 47-62%).
- 44% of women with pre-eclampsia (n=30, 95% CI=32-56%) underwent caesarean section, with 27% (n=18, 95% CI=16-37%) taking place pre-labour.

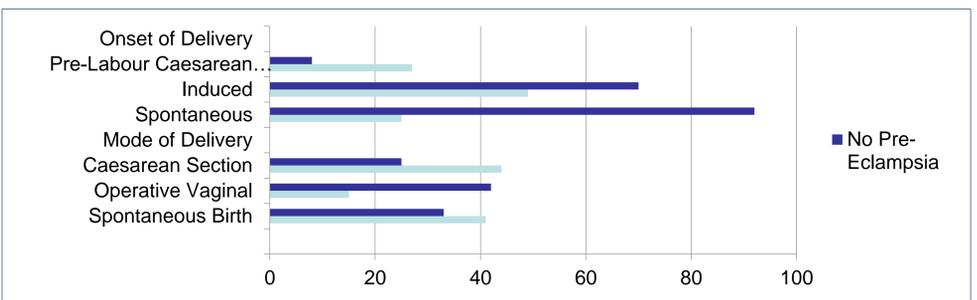


Figure 2. Onset of labour and mode of delivery according to pre-eclampsia status

Postnatal Health Service Use

- 28% of infants born to women with pre-eclampsia were admitted to neonatal intensive care unit (n=19, 95% CI=17-39%), compared to 9% of infants born to mothers without pre-eclampsia (n=16, 95% CI=5-14%).
- In the pre-eclampsia cohort both mother and child had a longer length of hospital stay post partum than the cohort without pre-eclampsia. 59% of mothers and 65% of infants stayed 4 days or more.

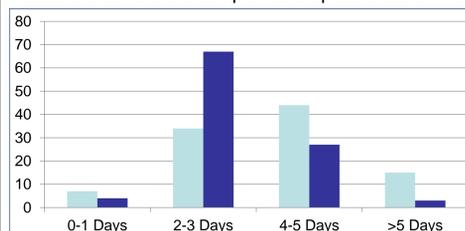


Figure 2. Mother's length of hospital stay post-delivery

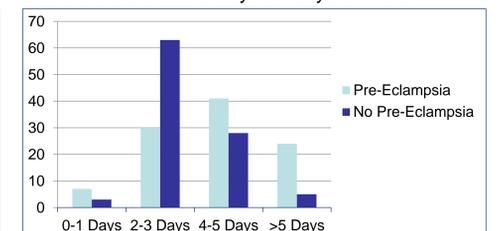


Figure 3. Infants length of stay post-delivery

Conclusions

Our results to date show an increased level of healthcare service use amongst women with pre-eclampsia across all stages of pregnancy. One of the strengths of this study is the use of medical records to estimate health service use rather than relying on self reported health service use. Possible weakness of this study would be the lack of detailed visits recorded on the patient information medical system therefore it is not possible to say if visits were related to pre-eclampsia. The next step of the study is the application of unit costs to estimate the direct cost of pre-eclampsia to the health system.

Bibliography

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