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How Much Greater is Obstetric Intervention in Women with Medical Disorders in Pregnancy When Compared to the General Population?

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Abstract

Introduction
The purpose of this study was to compare obstetric and neonatal outcomes between women attending a specialised maternal medicine service and the general obstetric population.

Methods
Women attending from January 2011 to December 2016 were identified from the clinic database. Medical diagnosis, demographics, obstetric and neonatal outcomes were compared with data from hospital annual report 2014.

Results
1873 women were compared with 8632 women who delivered at the hospital in 2014. Delivery before 34 weeks [82 (4.5%) vs 189 (2.2%)], induction of labour [761 (40.6%) vs 2664 (30.9%)] and delivery by Caesarean Section (CS) [664 (35%) vs 2479 (29%)] were higher p<0.001; but elective CS [334 (18%) vs 1425 (17%), p=0.18] did not differ between the two groups. Neonatal outcomes were similar.

Conclusion
Premature delivery, induction of labour and CS rates are higher in women with medical disorders in pregnancy. Encouragingly, 77% of women attempting vaginal birth in this group were successful.

Introduction

The National Maternity Strategy 2016-26 recognises that maternity care is becoming increasingly complex, and that maternity services need to respond to an increasingly diverse, complex population. The services need to provide safe, evidence-based, accessible care to all mothers[1]. Women with medical disorders in pregnancy require multidisciplinary input from many specialties and increased rates of obstetric intervention are well documented. With national caesarean section rates at an all time high[2], we aimed to examine how much higher is the obstetric intervention rate in women with medical disorders in pregnancy compared with the general obstetric population.

Methods

Women who attended the maternal medicine team at our hospital between January 1st 2011 and December 31st 2016 were identified from the clinic database. The Coombe Women and Infants University Hospital is a tertiary

referral centre delivering greater than 8000 women per year. We have developed a model of care for women with medical disorders in pregnancy, both outpatient and inpatient, from preconception to delivery by a team of obstetricians, physicians, anaesthetists, neonatologists and midwives. When women book for antenatal care at the hospital, they are booked with the medical team when they meet designated criteria. It must be emphasised that there are separate clinics at the hospital for care of women with pregestational and gestational diabetes and women with infectious disease. The care of women with medical conditions other than diabetes or infectious disease throughout pregnancy and postpartum is delivered by a team of three consultant obstetricians specialised in maternal medicine, a specialist midwife, and a dedicated specialist registrar and Senior House Officer. The outpatient clinic is attended by a haematologist and nephrologist and an anaesthetic clinic runs simultaneously. Cardiology patients are referred to a dedicated pregnancy cardiology clinic at a nearby general hospital. The team works closely with a dedicated pharmacist, social worker, physiotherapy and laboratory staff. A monthly MDT is conducted and a care plan is constructed and placed in the chart of each patient. The model encourages as physiological an obstetric outcome as possible once the medical condition is stable.

The purpose of this study is to determine the obstetric and neonatal outcomes in women who attend a specialised medical team compared to the general obstetric population attending the hospital. Medical diagnosis, age, parity, gestational age at delivery, mode of onset of labour and delivery were recorded. Birth weight, Apgar scores and admission to the Special Care Baby Unit (SCBU) were recorded. The data were compared with data from the general obstetric population that delivered at the hospital in 2014, published in the hospital's annual report[3]. The rate of elective Caesarean Section (CS) in the hospital population was deduced from Table 19.1 P76. Data was compared between the groups using the Chi-squared test. A p-value <0.05 was considered to be statistically significant.

Results

1873 women were identified with clotting (23%) and bleeding (15%) disorders, cardiovascular (22%), cerebrovascular (9%), renal (9%), GI (7%) and connective tissue (7%) disease and other disorders. This represents approximately 4% of the total hospital population. The range of medical diagnoses are shown in Table 1.

Table 1: Medical diagnoses in patient cohort

Medical conditions	**N**	**%**
Thrombosis/thromboprophylaxis/ Thrombophilia	325 + 104	17.4% +5.6%
Cardiac disease	274	14.6%
Cerebrovascular Disease	165	8.8%
Renal	160	8.5%
Clotting Factor Deficiency/ Platelet disorder	156 +124	8.3% +6.6%
Hypertension	135	7.2%
Liver/GI	125	6.7%
Connective Tissue Disorder	123	6.6%
Red cell/ white cell disorders	42 +7	2.2% +0.4%
Respiratory	39	2.1%
Oncology	12	0.6%
Dermatology	8	0.4%
Endocrine/Metabolic	3	0.2%
Immunology	3	0.2%
Recurrent pregnancy loss	3 +3	0.2% + 0.2%
Other	62	3.3%
Total	**1873**	**100 %**

When women attending the medical clinic were compared with the general hospital population, maternal age greater than 40 years [103 (5.5%) vs 544 (6.3%), p=0.2] did not differ. The parity profiles are shown in Table 2 and there is no difference in the number of women that are nulliparous in both groups [767 (41%) vs 3372 (39%), p=0.13]. Delivery before 34 weeks [82 (4.4%) vs 189 (2.2%), p=<0.001] and induction of labour [761 (40.6%) vs 2664 (30.9%), p<0.001] were more common in the medical clinic women. The rate of spontaneous vaginal delivery (SVD) [964 (51.5%) vs 4920 (57%), p<0.001] is lower, and operative vaginal delivery [232 (12.4%) vs 1252 (14.5%), p=0.02] rates are lower in the medical clinic women. The overall CS rate is higher in the medical patients [664/1873 (35%) vs 2479/8632 (28.7%), p=0.001] but the elective CS rate was similar in both groups [334/1873 (17.8%) vs 1425/8632 (16.5%), p=0.18].

Table 2: Comparisons between Medical clinic and general obstetric population

	Medical clinic	**General hospital population**	**p-value**
Maternal age greater than 40 years	103 (5.5%)	544 (6.3%)	0.17 NS
Parity			
Para 0	767 (41%)	3372 (39 %)	0.13 NS
Para 1	584 (31%)	3022 (35 %)	0.002
Para 2-4	474 (25%)	2120 (25 %)	0.48 NS
Para ≥5	48 (2.6%)	118 (1.4 %)	<0.001
Delivery before 34 weeks	82 (4.4%)	189 (2.2%)	<0.001
Induction of labour	761 (41 %)	2664 (31 %)	<0.001
SVD	964 (51.5%)	4920 (57%)	<0.001
Operative vaginal delivery	232 (12.4%)	1252 (14.5%)	0.02
Overall CS rate	664 (35%)	2479 (28.7%)	0.001
Elective CS	334 (17.8%)	1425 (16.5%)	0.18 NS
Babies born weighing less than 1500 grams	35 (1.9%)	120 (1.3%)	0.09 NS
Babies admitted to SCBU	148 (7.9%)	NA	

35/1880 (1.9%) babies were born weighing less than 1500 grams vs 120/8819 (1.3%), p=0.08. 148 (7.9%) of all the babies delivered to women with medical disorders were admitted to SCBU but it is difficult to find a comparative number in the remainder of the population in the annual report. 41/1873 (2.2%) compared to 474/8632 (5.5%) were admitted to SCBU when delivered after 38 weeks.

Discussion

The range and complexity of medical conditions in women attending the medical service are evident from Table 1. Women with medical conditions often delay having children because of their illness, or because of reduced fertility. It is of interest, therefore, that the percentage of women aged over 40 years or that are nulliparous in this patient group did not differ significantly from the total hospital population. There is a wide spectrum of medical disorders represented in these women and there is a wide spectrum of disease severity. It is not surprising that delivery before 34 weeks is twice as likely to occur, necessitated by either fetal growth restriction, preterm onset of labour or deterioration in the maternal condition. This is reflected in the higher percentage of babies weighing less than 1500 grams. Approximately 8% of the babies delivered to mothers attending the medical clinic were admitted to the SCBU. In 2014 12% of babies were admitted to the neonatal unit but it is unclear what level of care they required and these numbers may reflect admissions within four weeks of delivery and readmissions.

The background rate of induction at the hospital is almost 31% and is 10% higher in women with medical disorders. This may occur because of fetal or maternal complications, or occasionally to plan for the relevant expertise to be present at delivery. It is striking, however, that the rate of elective CS in this high risk cohort of patients is similar to that of the general population. The reason for this is unclear because indication for elective CS is not available from the database. The limitation of this study is that data has been derived from a database without detailed chart review and compared with hospital data that is generated by analysis of large patient numbers. There is the assumption that the general antenatal population is 'low risk'. Of interest a German study of women with chronic illness in pregnancy found that the incidence of vaginal haemorrhage, infection and acute disease was lower when compared to women in pregnancy without chronic disease[4]. The CS rate was higher in the women with chronic illness in this study[4]. Chronic diseases were identified by internationally defined criteria and included a vast number of conditions from infection, metabolic to cardiovascular, central nervous system, musculoskeletal etc.

There are different models of care for women with medical disorders in pregnancy. In the UK, women may attend a physician specialised in medical disorders of pregnancy or a physician specialised in their particular disorder, but their obstetric care is fragmented and they may deliver in different obstetric units. In the US, women with medical disorders may be cared for by obstetricians with training in maternal fetal medicine. In Ireland, the model of care is more like the American system where obstetricians trained in maternal fetal medicine conduct joint clinics with the relevant physicians. In our model of care, the women are managed from booking to postpartum by a team of obstetricians, physicians, anaesthetists and a specialist midwife with a holistic approach to every facet of their care. Multidisciplinary care is greatly facilitated by joint clinics. Decisions regarding labour and delivery are made jointly with an emphasis on normalising labour and delivery as much as possible. If the medical condition is stable, and there is no fetal compromise, these women are encouraged to have a physiological experience of childbirth, and feel empowered to do so. These figures show that one in five of these women have an elective CS, a figure that is not different from the general obstetric population. Although the overall CS rate is higher in this group, it is worth noting that of those women attempting vaginal birth, 77% are successful. These are encouraging figures for counselling women with medical disorders in pregnancy.

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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