

Clinical Paper

Do Regular Ultrasound Scans Reduce the Incidence of Stillbirth in Women with Apparently Normal Pregnancies?

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ABSTRACT

Objective: To determine the incidence of stillbirth in women who have regular ante-natal ultrasound compared to those that have infrequent scans in a low risk population.

Study Design: A retrospective observational study was performed in a tertiary center with 5,700 deliveries per annum. Data on all deliveries was collected via the Northern Ireland Maternity System Database. Only women with an apparently low risk pregnancy were included. Women who had private antenatal care often had frequent scans in the third trimester. Women who did not have private antenatal care often had scans infrequently. The still birth rate was calculated for both groups of women from 2007 to 2011 and compared using a Chi-squared analysis

Results: Our study included 23,519 'low-risk' deliveries spanning 2007-2011. This included 2,088 (9%) patients who had frequent ultrasound surveillance and delivery at term and 21,431 (91%) patients who did not. The overall stillbirth rate was 0.34% and 0.20% respectively which was not statistically different ($p=0.31$).

Conclusion: There is no difference in the rate of stillbirth between patients who have more frequent ante-natal ultrasound surveillance compared with those who do not in a low risk population.

Key Words: Stillbirth; Ultrasound scan; Low risk pregnancy

INTRODUCTION

It is recognised that intrauterine growth restriction (IUGR) is associated with stillbirth in about 40% of cases¹. Intuitively, the solution would be to offer ultrasound scanning in the third trimester to all women². There is however no evidence that routine third trimester scanning to detect IUGR for the expressed intention to prevent stillbirth, works. A systematic review from the Cochrane Collaboration of 8 studies (27,024 women)³⁻⁹ failed to find an improvement in perinatal outcome¹⁰. The National Institute of Clinical Excellence (NICE) does not recommend routine third trimester scanning in apparently uncomplicated pregnancy¹¹. This view is echoed by recommendations from the Royal College of Obstetricians and Gynaecologists (RCOG)¹². Despite these guidelines, many units across Northern Ireland continue to offer third trimester ultrasound scans to women with no clinical indication.

We previously published data suggesting that for women with an apparently normal pregnancy, scanning only once in the third trimester was not associated with a higher stillbirth rate compared to women who were scanned twice¹³. We wished to study this further and determine if women who were scanned infrequently in the third trimester had a higher stillbirth rate compared to women who were scanned

frequently. In Northern Ireland, we have a natural cohort of such women. Women who receive standard care in the Belfast Trust would receive one or two scans in the third trimester. Women who opt for private antenatal care would often receive up to 5 scans in the third trimester

MATERIALS AND METHODS

The study was submitted to the local Research Governance Committee. The local Research Governance Committee advised that Ethical Approval was not required as data gathered was from an anonymous data collection system. The local audit committee for the Belfast Trust gave its approval.

For those who opt for private antenatal care (PPs) and the pregnancy is deemed to be apparently normal, the frequency of visits is at the clinician's discretion and typically involves a greater frequency of third trimester ultrasound scans to assess fetal growth. These patients would often have four to five scans in the third trimester. These patients have their antenatal care in the private sector and delivery occurs in the Royal Hospital. Typically these patients are commonly

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offered induction of labour at term (but this does not occur in all cases).

Within our unit, routine non-private patient (Non PPs) antenatal care for apparently normal pregnant women consists of shared care with the General Practitioner (GP) and hospital. Patients undergo a booking visit and dating scan in addition to a fetal anatomy scan at 20 weeks. The assessment of fetal growth is performed by her GP or Midwife by palpation and symphysis-fundal height measurement, and is in line with guidance from the National Institute of Clinical Excellence. In between these visits to her GP and Midwife, she also attends the hospital at 29 and 35 weeks gestation to assess fetal growth by ultrasound. (After April 2011, the frequency of third trimester scans was reduced to only at 29 weeks). Induction of labour is typically offered ten to twelve days beyond the expected date of delivery.

For non PPs, before 2011, typically a total of 4 ultrasound scans would be performed. For non PPs, after 2011, typically a total of 3 ultrasound scans would be performed. For PPs, typically a total of 8 scans would be performed.

This study included 27,653 deliveries spanning the period 2007-2011 within a tertiary maternity unit, the Royal Jubilee Maternity Service, Belfast, which has approximately 5,700 deliveries per annum. Data was obtained from the computerized Northern Ireland Maternity System database (NIMATs).

Our primary objective was to determine the difference in stillbirth rate in apparently low risk pregnancies only in both groups. We therefore removed patients from our analysis who were deemed 'high-risk'. We removed patients that were positive for Group B streptococcal infection, women who had a multiple pregnancy, fetal congenital anomalies and women affected by medical conditions such as cardiac disease, haematological and renal conditions and diabetes, to form a 'low-risk' group. We calculated the total number of stillbirths for each year and also those that occurred in what were deemed 'low risk' pregnancies. Because we wanted to know if scanning had an impact on stillbirth, and as scanning in our unit occurred at 29 weeks gestation, we also removed deliveries before 28 weeks gestation from our final analysis (Table 1).

TABLE 1:

Maternal characteristics for PPs and Non-PPs.

	PPs mean (SD)	Non-PPs mean (SD)	P value Unpaired t test
Gestation at delivery	38 (2.0)	39 (1.8)	0.0001
Maternal age	34 (4.5)	30 (6.1)	0.0001
Parity	1.5 (1.1)	1.5 (1.1)	0.1402
Ethnicity	98% Caucasian	96% Caucasian	0.0059 (Fisher's test)

Statistical analysis was conducted using SPSS software® (IBM® Armonk, NY, USA). Comparison of proportions between private patient and non-private patient groups was performed using a Chi-squared test with Yates correction. All case notes of women who had a stillbirth were reviewed by hand to ensure data accuracy.

RESULTS

When 'high-risk' pregnancies (as defined in the methods section) were omitted the total number of deliveries within this period was 23,519 with a total of 50 stillbirths giving an overall stillbirth rate of 0.21%. Of the total 'low-risk' deliveries 2,088 of these (9%) were PPs and 21,431 (91%) were non-PPs.

The maternal characteristics for PPs and non-PPs are described in Table 1. This suggests that Private patients are delivered earlier but parity is not different between groups. Maternal age was however higher for the PP group.

A breakdown of the overall stillbirth rates in low-risk pregnancies per annum are demonstrated in Table 2. There were a total of 7 stillbirths in the PP group and 43 stillbirths in the non-PP group during the 2007-2011 period, meaning that the overall stillbirth rates were 0.34% and 0.20% respectively (Table 3). Chi-squared two-tailed analysis revealed that this difference was not statistically significant (Chi-Square = 1.05 p=0.31).

The distribution of stillbirths in accordance to gestation is shown for both groups in Figure 1. This demonstrates that in the non-PP group most stillbirths occurred at an advanced gestation.

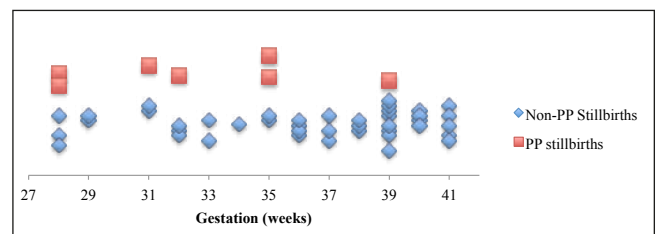


Fig 1. Scatterplot demonstrating the distribution of stillbirths according to gestation in Private and Non-Private patients

DISCUSSION

This study has shown that women who have an apparently uncomplicated pregnancy are no more likely to have a stillbirth if they are scanned infrequently compared with women who are scanned frequently.

The strengths of this study are that we had a robust data collecting system and that the notes for women who had a stillbirth were reviewed by hand.

The weakness of this study is that our numbers were small. Furthermore patients that refer themselves for private care may possess different characteristics e.g. they may have had a previous poor outcome. Another weakness is that

TABLE 2:

Table demonstrating the stillbirth rate from 2007-2011 in all 'low-risk' pregnancies.

Year	Total Deliveries n = 27,653	Number of deliveries from 'Low-risk' women n=23,519	Number of stillbirths (Total) n=75	Number of stillbirths 'low-risk' n=50	Stillbirth Rate 'low-risk'
2007	5478	4735	14	10	0.21
2008	5521	4718	13	5	0.11
2009	5501	4667	16	13	0.28
2010	5549	4756	18	12	0.25
2011	5604	4643	14	10	0.22

TABLE 3:

Table demonstrating stillbirth rates for Private patients (PP) and Non-Private patients (non PP) in 'low-risk pregnancies' from 2007-2011.

Year	Total Deliveries PP n = 2,088	No. Stillbirths PP n = 7	Stillbirth rate PP % (low risk)	Tot. Deliveries Non-PP n = 21,431	No. Stillbirths non-PP n = 43	Stillbirth rate non- PP % (low risk)
2007	479	1	0.21	4256	9	0.21
2008	458	0	0	4260	5	0.12
2009	490	4	0.82	4177	9	0.22
2010	366	1	0.27	4390	11	0.25
2011	295	1	0.34	4358	9	0.21

this study did not remove all risk factors for stillbirths such as overweight women, women at advanced maternal age, assisted conception, preterm prelabour rupture of membranes and women that had a previous history of a small baby.

Despite these major weaknesses, we were surprised at our results. These results suggest that scanning frequently, induction at term and the benefits of greater Consultant input did not reduce the stillbirth rate.

It is clear that a randomized controlled trial of ultrasound scanning for women with no obvious complications with the expressed intention of reducing stillbirth is required. However such a trial is unlikely to be performed.

Accepting the limitations of our work, we had previously shown that scanning twice vs. scanning once in the third trimester did not reduce the stillbirth rate¹³. In the current study we have further shown that frequent scanning does not reduce the stillbirth rate. These works, taken together with a Cochrane systematic review¹⁰, coupled with directions from NICE¹¹ and the RCOG¹² should suggest that we should stop offering ultrasound scanning for no clinical indication in apparently uncomplicated pregnancy.

CONFLICT OF INTEREST

Co-author Dr S Ong has private patients

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