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Group versus Traditional Prenatal Care in Low Risk Women Delivering at Term: a Retrospective Cohort Study

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Abstract

Background—Group prenatal care (GC) models are receiving increasing attention as a means of preventing preterm birth; yet, there is limited data on whether group care improves perinatal outcomes in women who deliver at term.

Objective—The purpose of this study was to evaluate our institutional experience with GC over the last decade and test the hypothesis that GC, compared to traditional individual care (TC), improves perinatal outcomes in women who deliver at term.

Study Design—We performed a retrospective cohort study of women delivering at term who participated in GC compared to TC. A group of 207 GC patients who delivered at term from 2004–2014 were matched in a 1:2 ratio to 414 patients with term singleton pregnancies who delivered at our institution during the same period by delivery year, maternal age, race, and insurance status. The primary outcome was low birthweight < 2500g. Secondary outcomes included early term birth (37.0–38 6/7 weeks), 5 minute APGAR score <7, special care nursery admission, neonatal intensive care unit (NICU) admission, neonatal demise, cesarean section, and number of prenatal visits. Outcomes were compared between the two groups using univariable statistics.

Results—Baseline characteristics were similar between the two matched groups. GC was associated with a significant reduction in low birthweight infants compared to TC (11.1% vs. 19.6%; RR 0.57; 95% confidence interval [CI] 0.37–0.87). Patients in GC were significantly less likely than controls to require cesarean delivery, have low 5 min APGAR scores and need higher level neonatal care (NICU: 1.5% vs. 6.5%; RR 0.22; 95% CI 0.07–0.72). There were no significant differences in rates of early term birth and neonatal demise.

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Conclusion—Low-risk women participating in GC and delivering at term had a lower risk of low birthweight and other adverse perinatal outcomes compared to women in TC. This suggests GC is a promising alternative to individual prenatal care to improve perinatal outcomes in addition to preterm birth.

INTRODUCTION

Group care (GC) is receiving increasing attention as an efficient and effective way to provide prenatal care.(1) The most widely known model of group prenatal care in the United States is CenteringPregnancy®.(2) This two-hour, every-other-week program focuses on nutrition, exercise, social support, health self-awareness, and relaxation techniques. Group prenatal care has been associated with decreased rates of preterm birth, increased birth weight in preterm infants, increased initiation of breastfeeding, increased utilization of postpartum family planning services, reduction in emergency visits in the third trimester, and varying degrees of improved satisfaction and increased knowledge.(3–5) Although some studies have reported no differences in pregnancy outcomes between group care and routine care (6–9) none have demonstrated adverse effects from group prenatal care.

Much of the excitement surrounding group prenatal care has focused on improved neonatal outcomes in the pre-term period, such as lower rates of preterm birth (4, 10) and small for gestational age infants. A recent meta-analysis of observational and randomized trials suggested African American women participating in group care are 45% less likely to deliver a preterm infant in an analysis limited to high-quality studies (9). Our institution is a large, urban tertiary referral center and a significant proportion of our patient population is comprised of low-income and African American women. We questioned whether group care also confers neonatal benefits among a cohort of women who delivered at our institution at 37 weeks gestation or beyond. The aim of this study was to examine the association between group prenatal care and neonatal outcomes in term births over the last decade at our institution. We hypothesized that women participating in GC who delivered at term would have improved perinatal outcomes compared to those in traditional individual care (TC).

MATERIALS AND METHODS

This was a retrospective cohort study of women participating in group care and delivering at term at our institution from 2004–2014. The study was approved by the Washington University Medical School Human Research Protection Office and patient consent was waived since this was deemed a minimal risk study.

Patients participating in group care in the Nurse Practitioner or low-risk resident clinic were included in this study. Women with hypertension, diabetes, multiple gestation, severe psychiatric disease or medical co-morbidities requiring a higher level of care were generally excluded from group care. Groups were comprised of 5–12 women with estimated due dates within 6 weeks of each other. Patients in group care requiring additional services could receive additional visits in traditional individual care at the discretion of the provider. Groups were co-led by a Certified Nurse Midwife (CNM) or Nurse Practitioner (NP) and Health Educator every other week beginning in the late 1st or early 2nd trimester. All GC

providers completed the CenteringPregnancy training; however, our clinical site did not receive CenteringPregnancy accreditation until 2014. The CenteringPregnancy curriculum adhered to the Centering Healthcare Institute curriculum throughout the study period. The only significant structural change to the program over the course of the study was an expansion from only caring for teens from 2004–2009 to caring for both teens and adult women from 2009–2014. Patients were offered participation in group care during their initial prenatal visit. Participation in group care was defined as attending at least 1 group session. Patients had the option of withdrawing from group care at any time. If women had more than one delivery during the study period, only the first birth was included. We excluded pregnancies delivering prior to 37 weeks or at an outside hospital. Patients in GC were matched in a 1:2 ratio to women with term singleton pregnancies by delivery year, maternal age (± 2 years), race (Black, White, Latina, Asian, Native American, other) and insurance status (public, private, other). Blinding of participants and providers was not possible due to the nature of the intervention. Trained obstetrics research assistants who were blinded to study assignment extracted information on maternal demographics, antepartum course, labor and delivery records and neonatal outcomes from the medical record. The a priori primary outcome was low birthweight less than 2500 grams since this was felt to be a significant marker of neonatal morbidity in term births. Secondary outcomes included early term birth (37.0–38 6/7 weeks), cesarean section, 5 minute APGAR score < 7 , special care nursery admission, neonatal intensive care unit (NICU) admission and neonatal demise.

Infant birthweight was defined by the value listed in the delivery record. Gestational age was determined either by known last menstrual period consistent with ultrasound (within 7 days of a first-trimester ultrasound or 14 days of a second-trimester ultrasound) or by the earliest ultrasound if last menstrual period was unknown or inconsistent with ultrasound. Special care nursery and NICU admission were specified if an infant spent more than 24 hours in either unit.

Data analysis was performed with descriptive and univariable statistics. Data analysis was performed with descriptive and bivariate statistics using a standard analysis with unpaired Student's t-test or Mann-Whitney U test for continuous variables and Chi-square or Fisher exact test for categorical variables as appropriate.⁽¹¹⁾ Relative risk (RR) was calculated to estimate the impact of GC on maternal and neonatal outcomes. A p-value of < 0.05 was considered statistically significant. The statistical analysis was performed using STATA (version 11, College Station, TX).

RESULTS

A total of 207 eligible patients participated in GC from 2004–2014. They were matched in a 1:2 ratio to 414 women with term singleton pregnancies. Baseline characteristics were similar between the two matched groups (Table 1). Specifically, there were no significant differences in maternal age, racial composition, parity and use of alcohol, tobaccos and recreational drugs. Patients participating in GC were significantly less likely to have minimal prenatal care with 1–5 visits (7% GC vs. 24% TC) and more likely to attend more than 10 prenatal visits (50% GC vs. 22% TC) ($p < 0.001$).

GC was associated with a significantly lower rate of the primary outcome of low birthweight infants (11.1% vs. 19.6%; RR 0.57; 95% confidence interval [CI] 0.37–0.87) (Table 2). There was no significant difference in early term birth between groups. Rates of cesarean delivery were significantly lower in GC compared to TC (14% vs. 25%, RR 0.56; 95% CI 0.39–0.82). Women in GC were significantly less likely to have a 5 minute APGAR score < 7, special care nursery admission or NICU admission (Table 2). However, there was no difference in the rate of neonatal demise between groups. No adverse events were reported as a result of participation GC and there was no loss to follow-up.

DISCUSSION

Low risk patients who delivered at term in our predominantly African American population who participated in GC had a lower risk of adverse neonatal outcomes, including low birth weight, cesarean delivery, low APGAR score, and higher level nursery admission than comparable women who received traditional prenatal care. They were also significantly less likely to have minimal prenatal care (<5 prenatal visits) than those in TC, suggesting women in GC may be more engaged in their care.

Previous studies assessing low birthweight less than 2500 grams in GC compared to TC have not found a significant difference.(4, 12–16) In comparison to observational studies, our study findings may reflect the more rigorous methodology including matching patients. It may also be because our study population was limited to term births while prior studies also included preterm births. While a birthweight of 2500 g at term reflects small for gestational age at less than the 10th percentile, it may be within the normal weight range for gestational ages at 36 weeks or less.(17) Therefore, patients in our population who were classified as low birthweight truly were small for gestational age, which was likely not true for patients in prior studies who delivered prior to 37 weeks. Previous studies have suggested that there may be an association between maternal stressors and low birthweight. (18–20) Furthermore, a recent study showed women participating in GC have significantly lower levels of stress;(21) thus, suggesting biological plausibility.

A major strengths of our study is the matched design. Because patients who choose to participate in GC are generally low risk and likely represent a more motivated, engaged patient population than those who engage in the standard of care, matching minimized differences between groups which may impact perinatal outcomes. We also have a well-established group prenatal care program with providers who are trained by the Centering Healthcare Institute and closely follow the Centering curriculum..

However, our study has limitations. While we matched the two groups resulting in comparable baseline characteristics, there is the potential for selection bias because women selecting GC may represent a more motivated segment of the patient population. Our study may not be generalizable to other populations since the women we serve are primarily low-income, African American women. While a recent meta-analysis from our group showed reduced rates of preterm birth among African American women,(10) there was no difference in rates of preterm birth overall so it is possible the benefits of GC are not evenly distributed across all demographic groups. There is also the possibility of residual confounding by

unmeasured variables. Due to the retrospective design of the study, we also lacked information on postpartum behaviors such as breastfeeding and contraception initiation.

The model of prenatal care in the United States is based on minimal evidence.(22, 23) There is little time for patient engagement and education during the currently recommended American Congress of Obstetrics and Gynecology (ACOG) prenatal visit schedule for uncomplicated first pregnancies, which recommends a visit every 4 weeks until 28 weeks, every 2 weeks until 36 weeks, and weekly until delivery.(24) Since each of these visits lasts for 10–15 minutes, the average pregnant woman who initiates care in the late 1st trimester and delivers at 40 weeks spends about 2 hours with her provider over the course of her entire pregnancy. It is nearly impossible to have thoughtful conversations about routine pregnancy care, new problems, contraception, breastfeeding, infant care and anything else that may arise under these time limitations. Women participating in group care have approximately 20 hours with their obstetric provider and have the opportunity to learn and support one-another.

In conclusion, we found GC likely confers neonatal benefit for low-risk women who deliver at term with regard to low birthweight and other adverse perinatal outcomes compared to women in TC. Our study findings, together with data from other studies, suggest that group prenatal care may be a new and innovative way to provide prenatal care to low-risk individuals belonging to high-risk demographic groups to improve perinatal outcomes.

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Table 1

Baseline characteristics of patients receiving group and traditional prenatal care

Baseline Characteristic	Group Care n=207	Traditional Care n=414	P-value
Maternal Age median (IQR)	17 (16–18)	18 (17–19)	>0.99
Race			>0.99
-Black	180 (89.96)	360 (86.96)	
-White	24 (11.59)	48 (11.59)	
-Other	3 (1.45)	6 (1.45)	
Public Insurance	207 (100%)	414 (100%)	>0.99
Nulliparity	162 (78.26)	310 (74.88)	0.35
Obesity (BMI ≥30)	93 (44.93)	183 (44.20)	0.86
Alcohol	3 (1.45)	5 (1.21)	0.80
Tobacco	18 (8.74)	56 (13.73)	0.07
Drugs	30 (14.49)	37 (11.11)	0.69

Data presented as n (%) unless otherwise noted

Table 2

Perinatal Outcomes with Group versus Traditional Prenatal Care

Perinatal outcome*	Group Care n=207	Traditional Care n=414	P-value	RR (95% CI)
Primary outcome				
Low Birthweight < 2500g	23 (11.11)	81 (19.57)	<0.01	0.57 (0.37–0.87)
Secondary Outcomes				
Early Term Delivery (37.0–38.6)	73 (38.02)	96 (29.81)	0.06	1.28 (1.00–1.63)
Cesarean delivery	29 (14.01)	103 (24.88)	<0.01	0.56 (0.39–0.82)
Low 5 minute APGAR score (<7)	3 (1.45)	24 (5.80)	0.01	0.25 (0.08–0.82)
Special Care Nursery	18 (8.70)	61 (14.73)	0.03	0.59 (0.36–0.97)
NICU admission	3 (1.45)	27 (6.52)	0.01	0.22 (0.07–0.72)
Neonatal Demise	1 (0.48)	5 (1.21)	0.38	0.40 (0.05–3.40)

Data presented as n (%)

NICU-neonatal intensive care unit admission

Bolded items denote significance p<0.05