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Outcomes for Gestational Carriers Versus Traditional Surrogates in the United States

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Abstract

Background: Little is known about the obstetric and procedural outcomes of traditional surrogates and gestational carriers.
Materials and Methods: Participants included 222 women living in the United States who completed a brief online survey between November 2015 and February 2016. Differences between gestational carriers ($n = 204$) and traditional surrogates ($n = 18$) in demographic characteristics, pregnancy outcomes, and procedural outcomes were examined using chi-squared tests, Fisher's exact tests, and *t*-tests.
Results: Out of 248 eligible respondents, 222 surveys were complete, for a response rate of 89.5%. Overall, obstetric outcomes were similar among gestational carriers and traditional surrogates. Traditional surrogates were more likely than gestational carriers to have a Center for Epidemiologic Studies Depression Scale Revised score of 16 or higher (37.5% vs. 4.0%). Gestational carriers reported higher mean compensation ($27,162.80 vs. $17,070.07) and were more likely to travel over 400 miles (46.0% vs. 0.0%) than traditional surrogates.
Conclusions: Procedural differences, but not differences in obstetric outcomes, emerged between gestational carriers and traditional surrogates. To ensure that both traditional surrogates and gestational carriers receive optimal medical care, it may be necessary to extend practice guidelines to ensure that traditional surrogates are offered the same level of care offered to gestational carriers.

Keywords: surrogacy, pregnancy, infertility

Introduction

Gestational carrier arrangements, which involve a woman carrying a pregnancy for another person or couple, are becoming more common in the United States.[1,2] Gestational carriers undergo an embryo transfer procedure using third party sperm and oocytes.[1] Traditional surrogates, who are women who are inseminated with the sperm of a man who is not her partner to carry a pregnancy for another person or couple, are also still used in the United States. Traditional surrogates are both the oocyte donors and the carriers of these pregnancies. Like other pregnancies, gestational carrier and traditional surrogate pregnancies both involve medical risks. A recent review of outcomes of gestational carrier and traditional surrogate pregnancies found a dearth of research, with few studies comparing gestational carriers and traditional surrogates.[3]

In addition, gestational carriers and traditional surrogates may face logistical burdens, such as travel for screening or medical appointments, and potential upfront costs of medical care. These burdens have not been well documented in the literature, either. A committee opinion from the American Society for Reproductive Medicine (ASRM) states that gestational carriers should receive ''fair and reasonable economic compensation'' taking into account the burdens shouldered by the gestational carriers, but does not make a recommendation about what amount of compensation may be considered fair.[4] No recommendations are provided for traditional surrogates because traditional surrogacy is not offered by most providers. Whether the lack of recommendations for traditional surrogacy impacts care received by these women and birth outcomes is unclear. The purpose of this study was to compare pregnancy and procedural outcomes between gestational carriers and traditional surrogates living in the United States.

Materials and Methods

The methods of this study and sample size calculations have been previously described.[5] Women 18 years of age or

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older living in the United States who delivered a baby in 2009 or later as the result of a gestational carrier or traditional surrogacy arrangement were eligible to participate in a cross-sectional study. Participants were recruited from November 2015 to February 2016 by posting study announcements in online groups geared toward surrogates, including websites and message boards, and through infertility-related email lists. Participants were invited to complete a brief online survey about their most recent experience as a gestational carrier or traditional surrogate and were reimbursed for their time with a $5 Amazon.com gift card. Participants were asked to indicate whether they were a gestational carrier (''became pregnant with a baby that was not genetically related to you'') or a traditional surrogate (''became pregnant with a baby that was genetically related to you, but was intended to be raised by someone else''). The survey included questions about medical and mental health screenings, health behaviors and outcomes, compensation and reimbursement, and demographic characteristics. The total target sample size was $N = 300$. Recruitment ended on February 29, 2016. Of the 309 respondents who initiated the survey, 248 met eligibility criteria, and 222 completed the survey. Incomplete surveys were excluded from these analyses.

The primary exposure of interest in this study was having been a gestational carrier (91.9%, $n = 204$) or traditional surrogate (8.1%, $n = 18$). Medical outcomes of interest included number of babies delivered as a result of this pregnancy, pregnancy and delivery complications, type of delivery, reason for cesarean section, breastfeeding and pumping breast milk for the baby or babies that resulted from this arrangement, current depression, and whether participants had given birth to any of their own children since their first traditional surrogate or gestational carrier arrangement. Participants were asked to select all that apply from a list of pregnancy and delivery complications, including high blood pressure (gestational hypertension), gestational diabetes, preeclampsia, preterm (before 37 weeks of pregnancy) premature rupture of membranes, preterm (before 37 weeks of pregnancy) labor, failure to progress during labor, postpartum hemorrhage, and other (please specify) complications. Pregnancy and delivery complications were dichotomized (yes or no) for analysis. Depression was assessed using the total score from the 20-item Center for Epidemiologic Studies Depression Scale Revised (CESD-R) and dichotomized (≥ 16 or ≤ 15) after algorithmic assessment for major depressive episode.[6] To examine differences in procedural and logistical burdens between gestational carrier and traditional surrogate arrangements, other outcomes included whether compensation was received, amount of compensation in U.S. dollars, satisfaction with compensation, whether participants were reimbursed for expenses, travel outside of the United States for medical procedures, and distance traveled for artificial insemination or embryo transfer. Location of artificial insemination was also ascertained from those who identified as traditional surrogates.

Differences between traditional surrogates and gestational carriers were assessed using chi-squared tests and Fisher's exact tests for categorical variables and two sample *t*-tests with equal variances for continuous variables with statistical significance assessed at $p < 0.05$. Analyses were conducted using Stata SE Version 14.0.[7] The UTMB Institutional Review Board approved this study (No. 15-0245).

Results

Of the 222 complete responses, 204 (91.9%) were gestational carriers and 18 (8.1%) were traditional surrogates. The mean age at delivery of respondents was 32.7 (standard deviation [SD] 5.3) and the mean number of own children was 2.7 (SD 1.5) (Table 1). Respondents were primarily white (92.3%), non-Hispanic (94.6%), married or living together (87.4%), and employed full-time (56.4%). Few participants had used public assistance in the last year (8.6%). The majority of participants (62.0%) were first time carriers and the majority of births occurred in 2014 or later (65.5%).

There were several significant demographic differences between gestational carriers and traditional surrogates. Gestational carriers were older at delivery (33.0 years vs. 29.3 years, respectively), less likely to identify as Hispanic (3.9% vs. 22.2%), less likely to be a student (14.3% vs. 50.0%), more likely to have private health insurance (94.1% vs. 66.7%), and more likely to be a first time carrier (65.2% vs. 23.5%) when compared to traditional surrogates. There were no differences between groups on other demographic measures.

Pregnancy, delivery, and postpartum characteristics were similar between gestational carriers and traditional surrogates. Breastfeeding and pumping characteristics differed between groups, with gestational carriers more likely to report pumping but not breastfeeding (50.0% vs. 22.2%) and less likely to report breastfeeding and pumping (13.2% vs. 38.9%) and breastfeeding without pumping (1.5% vs. 16.7%) than traditional surrogates (Table 2). Gestational carriers were less likely than traditional surrogates to report having given birth to an additional child of their own since their first gestational carrier or traditional surrogate arrangement (6.9% vs. 64.7%). There were no differences in mean number of babies delivered, but gestational carriers were more likely to have delivered twins than traditional surrogates (34.8% vs. 16.7%). There were no differences in whether or not there were complications or whether the birth was a vaginal delivery between gestational carriers and traditional surrogates. None of the participants met CESD-R criteria for major depressive episode, nor did they meet criteria for probable or possible major depressive episode. The total CESD-R score for the full sample ranged from 0 to 49 (data not shown in table), with differences in mean score between gestational carriers and traditional surrogates (3.0 vs. 13.7). There were also differences between groups in those scoring 16 or higher on the CESD-R (3.9% vs. 37.5%), indicating higher subthreshold depression symptoms among traditional surrogates.

There were also differences between groups in travel associated with pregnancy. Gestational carriers were less likely to travel outside of the United States for any medical procedures (7.4% vs. 27.8%), but were more likely to report having traveled over 400 miles for an embryo transfer (46.0% vs. 0.0%) compared to traditional surrogates for artificial insemination (Table 3). One traditional surrogate (5.6%) reported becoming pregnant using *in vitro* fertilization, with others reporting artificial insemination occurring in hospitals (38.9%), clinics (27.8%), and at home (27.8%). Gestational carriers were no more likely to report having received compensation than traditional surrogates (92.2% vs. 88.9%), but gestational carriers reported significantly higher mean compensation than traditional surrogates (US$27,162.80 vs. US$17,070.07). There were no differences between groups on satisfaction with compensation whether or not participants reported having

Table 1. Demographic Characteristics of Gestational Carriers ($N=204$) and Traditional Surrogates ($N=18$)

	Total, (n=222), (%)	*Gestational carriers, (n=204),* n *(%)*	*Traditional surrogates, (n=18),* n *(%)*	p[a]
Age at delivery, mean (SD)	32.7 (5.3)	33.0 (5.3)	29.3 (3.9)	0.004*
Number of own children, mean (SD)	2.7 (1.5)	2.7 (1.4)	2.7 (2.0)	0.988
Race				
White	203 (92.3)	187 (92.6)	16 (88.9)	0.636
Other	17 (7.7)	15 (7.4)	2 (11.1)	
Ethnicity				
Hispanic	12 (5.4)	8 (3.9)	4 (22.2)	0.010*
Non-Hispanic	210 (94.6)	196 (96.1)	14 (77.8)	
Education				
High school diploma or GED	71 (32.0)	65 (32.0)	6 (33.3)	0.255
Associate's degree	67 (30.2)	59 (28.9)	8 (44.4)	
Bachelor's degree	54 (24.3)	50 (24.5)	4 (22.2)	
Graduate or professional degree	30 (13.5)	30 (14.7)	0 (0.0)	
Relationship status				
Married or living together	194 (87.4)	178 (87.3)	16 (88.9)	1.000
Not married or living together	28 (12.6)	26 (12.8)	2 (11.1)	
Household income				
$0–$24,999	11 (5.0)	8 (3.9)	3 (16.7)	0.058
$25,000–$49,999	44 (19.9)	43 (21.2)	1 (5.6)	
$50,000–$74,999	60 (27.2)	56 (27.6)	4 (22.2)	
$75,000–$99,999	44 (19.9)	38 (18.7)	6 (33.3)	
$100,000 and up	62 (28.1)	58 (28.6)	4 (22.2)	
Religion				
Christianity	116 (53.0)	105 (52.2)	11 (61.1)	0.772
Other religion	24 (11.0)	22 (11.0)	2 (11.1)	
No religion	79 (36.1)	74 (36.8)	5 (27.8)	
Employment status				
Employed full-time	124 (56.4)	113 (55.7)	11 (64.7)	0.956
Employed part-time	51 (23.2)	48 (23.7)	3 (17.7)	
Not employed, looking for work	4 (1.8)	4 (2.0)	0 (0.0)	
Not employed, not looking for work	41 (18.6)	38 (18.7)	3 (17.7)	
Student status				
Full-time student	22 (10.0)	17 (8.4)	5 (27.8)	0.002*
Part-time student	16 (7.2)	12 (5.9)	4 (22.2)	
Not a student	183 (82.8)	174 (85.7)	9 (50.0)	
Health insurance				
Private insurance (employer-based or direct)	203 (91.9)	191 (94.1)	12 (66.7)	0.000*
Medicaid or no health insurance	18 (8.1)	12 (5.9)	6 (33.3)	
Public assistance use in last year				
Yes	19 (8.6)	15 (7.4)	4 (22.2)	0.055
No	202 (91.4)	188 (92.6)	14 (77.8)	
First time carrier				
Yes	137 (62.0)	133 (65.2)	4 (23.5)	0.001*
No	84 (38.0)	71 (34.8)	13 (76.5)	

[a]*P*-values calculated based on chi-squared or Fisher's exact tests for categorical variables and two sample *t*-tests with equal variances for continuous variables.

*p-Value <0.05.

GED, general educational development; SD, standard deviation.

received compensation. Gestational carriers were more likely than traditional surrogates to report that they had been reimbursed for all expenses incurred (79.2% vs. 58.8%).

Discussion

Despite the potential for medical risks, high quality research comparing demographic characteristics and outcomes for gestational carriers and traditional surrogates in the United States has been sparse. This may be due to difficulty in obtaining data from traditional surrogates as these arrangements may be made outside of a medical setting. Although this sample included a small number of traditional surrogates, a number of differences were detected. Traditional surrogates were younger, more likely to be Hispanic, more likely to be students, and less likely to have private or employer-based

Table 2. Self-Reported Pregnancy Outcomes for Gestational Carriers and Traditional Surrogates

	Total, (n = 222)	*Gestational carriers, (n = 204),* n *(%)*	*Traditional surrogates, (n = 18),* n *(%)*	p[a]
Number of babies delivered				
Singleton	145 (65.3)	132 (64.7)	13 (72.2)	0.009*
Twins	74 (33.3)	71 (34.8)	3 (16.7)	
Triplets	3 (1.35)	1 (0.49)	2 (11.1)	
Number of babies delivered, mean (SD)	1.36 (0.51)	1.36 (0.49)	1.39 (0.70)	0.805
Complications[b]				
Yes	117 (54.2)	105 (53.0)	12 (66.7)	0.266
No	99 (45.8)	93 (47.0)	6 (33.3)	
Type of delivery				
Vaginal	140 (63.1)	129 (63.2)	11 (61.1)	0.858
Any cesarean	82 (36.9)	75 (36.8)	7 (38.9)	
Reason for c-section[c]				
History of c-section	34 (41.5)	28 (37.3)	6 (85.7)	0.018*
Multiples	33 (40.2)	33 (44.0)	0 (0.0)	0.038*
Failure to progress	3 (3.7)	3 (4.0)	0 (0.0)	1.000
Fetal distress	16 (19.5)	16 (21.3)	0 (0.0)	0.336
Breech presentation	19 (23.2)	18 (24.0)	1 (14.3)	1.000
No medical reason	1 (1.2)	1 (1.3)	0 (0.0)	1.000
Other	13 (15.9)	12 (16.0)	1 (14.3)	1.000
CESD-R				
16 or higher	14 (6.5)	8 (4.0)	6 (37.5)	0.000*
15 or lower	203 (93.6)	193 (96.0)	10 (62.5)	
Breastfeeding				
Yes, breastfed and pumped	34 (15.3)	27 (13.2)	7 (38.9)	0.000*
Yes, breastfed, no pumping	6 (2.7)	3 (1.5)	3 (16.7)	
Yes, pumping, no breastfeeding	106 (47.8)	102 (50.0)	4 (22.2)	
No	76 (34.2)	72 (35.3)	4 (22.2)	
Birth any of own children since first GC/TS				
Yes	25 (11.4)	14 (6.9)	11 (64.7)	0.000*
No	194 (88.6)	188 (93.1)	6 (35.3)	

[a]P-values calculated based on chi-squared or Fisher's exact tests for categorical variables and two sample *t*-tests with equal variances for continuous variables.

[b]Participants were asked to select all that apply from the following list: high blood pressure (gestational hypertension), gestational diabetes, preeclampsia, preterm (before 37 weeks of pregnancy) premature rupture of membranes, preterm (before 37 weeks of pregnancy) labor, failure to progress during labor, postpartum hemorrhage, and other (please specify) complications.

[c]Participants could select more than one reason for c-section.

*p-Value <0.05.

CESD-R, Center for Epidemiologic Studies Depression Scale Revised; GC/TS, Gestational carrier or traditional surrogacy arrangement.

health insurance compared to gestational carriers. Moreover, traditional surrogates were more likely than gestational carriers to report having had a previous cesarean section and were more likely to report having had a previous traditional surrogate or gestational carrier arrangement.

Similar to prior studies, we found that obstetric outcomes between gestational carriers and traditional surrogates were similar.[3] One difference between groups included breastfeeding and pumping. Overall, breastfeeding was high, though traditional surrogates were more likely to report having breastfed or breastfed and pumped, and gestational carriers were more likely to report having pumped only. Regardless of differences in milk delivery between groups, the high percentage of women reporting to have breastfed or pumped breast milk indicate a continued involvement with the babies and a continued investment in time and effort after birth that may not be accounted for in guidelines and contracts.

Traditional surrogates in this study were more likely to score 16 or higher on the CESD-R, indicating that there may be more subthreshold depressive symptoms among traditional surrogates than gestational carriers. Since traditional surrogates are also not included in the ASRM recommendations for screening of gestational carriers,[8] it is possible that women seeking out a traditional surrogacy experience may be more likely to have existing depression than women anticipating becoming gestational carriers. Our findings differ from a previous study that found no difference between scores on the Edinburgh Depression Scale between gestational carriers and traditional surrogates[9] and the long-term follow-up of some of the same participants that found no differences between groups on the Beck Depression Inventory-II.[10]

The ASRM recommends psychosocial counseling that includes a discussion about a potential gestational carrier's desire for more of her own children.[8] Traditional surrogates in this study were more likely than gestational carriers to have delivered one of their own children since their first gestational carrier or traditional surrogacy birth. While the ASRM recommendation does not include traditional surrogates and

Table 3. Self-Reported Procedural and Financial Outcomes for Gestational Carriers and Traditional Surrogates

	Total (n = 222)	*Gestational carriers (n = 204), n (%)*	*Traditional surrogates, (n = 18), n (%)*	p[a]
Receive compensation				
Yes	204 (91.9)	188 (92.2)	16 (88.9)	0.645
No	18 (8.1)	16 (7.8)	2 (11.1)	
Amount of compensation if received in USD, mean (SD)	26390.74 (8371.07)	27162.87 (7756.69)	17070.07 (10109.70)	0.000*
Satisfaction with comp				
Very dissatisfied	2 (0.9)	2 (1.0)	0 (0.0)	0.718
Dissatisfied	12 (5.5)	11 (5.5)	1 (5.9)	
Neither satisfied nor dissatisfied	21 (9.6)	19 (9.4)	2 (11.8)	
Satisfied	92 (42.0)	83 (41.1)	9 (52.9)	
Very satisfied	92 (42.0)	87 (43.1)	5 (29.4)	
Receive reimbursements				
Yes, reimbursed for all expenses	170 (77.6)	160 (79.2)	10 (58.8)	0.014*
Yes, reimbursed for some, but not all, expenses	45 (20.6)	40 (19.8)	5 (29.4)	
No, not reimbursed	4 (1.8)	2 (1.0)	2 (11.8)	
Travel outside the US for AI/ET				
Yes	20 (9.0)	15 (7.4)	5 (27.8)	0.004*
No	202 (91.0)	189 (92.7)	13 (72.2)	
Travel distance for AI/ET				
0–30 miles	33 (15.0)	30 (14.9)	3 (16.7)	0.000*
31–60 miles	27 (12.3)	19 (9.4)	8 (44.4)	
61–120 miles	25 (11.4)	21 (10.4)	4 (22.2)	
121–300 miles	30 (13.6)	28 (13.9)	2 (11.1)	
301–400 miles	12 (5.5)	11 (5.5)	1 (5.6)	
401 miles or more	93 (42.3)	93 (46.0)	0 (0.0)	
If TS, where AI?				
Clinic	n/a	n/a	5 (27.8)	n/a
Hospital	n/a	n/a	7 (38.9)	
Home	n/a	n/a	5 (27.8)	
Used IVF	n/a	n/a	1 (5.6)	

[a]P-values calculated based on chi-squared or Fisher's exact tests for categorical variables and two sample *t*-tests with equal variances for continuous variables.

*p-Value <0.05.

AI/ET, artificial insemination or embryo transfer; IVF, *in vitro* fertilization; TS, traditional surrogate; US, United States.

while family-building ideals may change over time, the stark difference between the two groups should be examined further due to the small but real risk of loss of fertility during a gestational carrier or traditional surrogacy pregnancy.

The respondents to our survey indicate that traditional surrogacy is still offered by some fertility specialists. The majority of traditional surrogate respondents indicated that their artificial insemination procedures were performed in healthcare facilities, though one quarter indicated that their inseminations were done at home. Whether those using home insemination had access to a clinic that offered services for those pursuing traditional surrogacy, whether home insemination was a choice governed by finances, and whether home insemination was preferred for all participants is unknown.

Gestational carriers reported receiving substantially higher mean compensation compared to traditional surrogates. Differences in compensation may be due to the ASRM committee opinion that gestational carriers receive reasonable compensation.[4] Higher compensation may also have been due to the higher burden placed on gestational carriers as they usually undergo more medical screening, interventions, and procedures. Nonmedical burdens measured in this study included travel outside of the United States, which was reported more frequently by traditional surrogates, and travel distance, with gestational carriers reporting traveling much farther from home than traditional surrogates. Whether the potential for lower compensation and lower overall cost of traditional surrogacy may be more appealing for intended parents without the financial ability to pursue a gestational carrier arrangement should be further examined.

Strengths of this study include the ability to compare outcomes between gestational carriers and traditional surrogates. Previous studies have often focused on either gestational carriers or traditional surrogates, without the ability to compare the two. Additionally, this study examined burdens experienced by gestational carriers and traditional surrogates, including travel and reimbursement, which have not been examined in previous studies.

This study also has important limitations. The sample size was small, particularly for traditional surrogates. It is possible that traditional surrogacy is not as common as gestational

carriers, traditional surrogates were not as easily captured by the recruiting methods, or traditional surrogates may not be as likely to respond to surveys. This may have impacted our ability to detect differences between groups on some measures. The survey was based on self-report that may be subject to recall bias. Future studies should include review of medical records, if possible. Finally, the results may not be generalizable to all gestational carriers or traditional surrogates since those who do not engage in online gestational carrier or traditional surrogate communities may not have been captured.

Traditional surrogates in this study had lower socioeconomic status and differences in age and ethnicity when compared to gestational carriers. These differences, when considered with the lower compensation reported by traditional surrogates, suggest that traditional surrogates may benefit from the ASRM guidelines for the screening of and practices utilizing gestational carriers.

Conclusions

Procedural differences, but not differences in obstetric outcomes, emerged between gestational carriers and traditional surrogates. Current recommendations for practices utilizing gestational carriers and the expert committee opinion on the rights of gestational carriers do not currently cover traditional surrogates.[4,8] To ensure that both traditional surrogates and gestational carriers receive optimal medical care, it may be necessary to extend guidelines to ensure that traditional surrogates are offered the same level of care offered to gestational carriers.

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Author Disclosure Statement

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