



Pregnancy outcomes in female physicians in procedural versus non-procedural specialties



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ABSTRACT

Background: Procedural based medical specialties require a longer training period and more intensive physical demands. The impact of working in procedural versus nonprocedural fields on pregnancy outcomes is not well understood.

Methods: Data from 1559 US attending female physician mothers was gathered via an anonymous, IRB-approved online survey.

Results: Of the cohort, 400 (25.7%) reported practicing in a procedural field. Women in procedural fields were slightly older at the time of their most recent pregnancy. Rates of assistive reproductive technology use (procedural: 20.2% vs nonprocedural: 23.3%, $P = 0.2$), missing work during pregnancy (28.2% vs 24.5%, $P = 0.13$), cesarean delivery rate (36.0% vs 34.5%, $P = 0.61$), and missed work due to preterm labor (12.3% vs 12.5%, $P = 0.91$) were similar between the two groups.

Conclusion: Although proceduralists were more likely to delay pregnancy, women in procedural fields had comparable rates of reproductive assistance, cesarean delivery, and missed work due to pregnancy-related complications despite the perceived challenges facing this group.

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1. Introduction

Women are entering medicine in increasing numbers, although with an appreciably slower rate of increase within procedural fields.¹ Female physicians report high rates of delaying pregnancy due to their careers, particularly in procedural fields such as surgery and its subspecialties; for example, a survey of 113 thoracic surgeons revealed that 98% of female surgeons delayed their pregnancy due to their career.² Surgeons in the United States are, on average, 36 years of age at their time of first staff appointment, though this can extend even longer given the trend toward pursuing additional fellowships and further specialization.^{3,4}

For female proceduralists, the important milestone of having completed postgraduate training also coincides with a significant rise in the risk of adverse pregnancy outcomes. Advanced maternal age, or 35 years of age and older, is associated with increased risk of

infertility, preterm labor, low-birth-weight infants, cesarean delivery, and neonatal intensive care admission following delivery.⁵ The extent to which pregnancy complications accounts for missed work among female physicians is unknown.

Trainees face significant pressure when choosing a specialty and express concerns regarding fertility, as well as balancing family and career.⁶ There is concern that this may drive women away from procedural fields or lead to procedural trainees opting to change to a different, potentially more life-style compatible, field.⁶ This issue becomes increasingly critical in light of the looming shortage of general and subspecialty surgeons within the US.^{7,8} Given these many concerns, the goal of the current study was to use a large, nationwide sample to compare proceduralists and non-proceduralists with respect to pregnancy, infertility, and missed work.

2. Materials and methods

A convenience sample of female physician mothers was recruited from the Physician Moms Group (PMG), a Facebook group established in 2014. At the time of the study, there were 14,518

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members in the group. A link to an anonymous, secure questionnaire was posted on the PMG Facebook page on April 28th, 2015 and remained active for 4 weeks. Repeat submissions were limited by IP address.

Proceduralists were defined as all surgical specialties, anesthesiologists, gastroenterologists, and obstetricians/gynecologists. Analyses were limited to those respondents who were attending physicians during their most recent pregnancy. Practice setting was categorized as academic, private, locum tenens, rural, or community-based as self-identified by the respondent. Demographic data was collected including age, practice type and location, age at first pregnancy, and number of children. Information regarding conception, including the use of reproductive assistance as well as missed work due to pregnancy complications, was also collected.

For bivariate analyses, count data were analyzed using χ^2 tests. Fisher's exact test was used for cell counts equal to or less than 5. Multivariable logistic regression was used to evaluate the adjusted impact of procedural status on time to conception, pregnancy outcomes, and missed work related to pregnancy complications. Covariates included in the model were selected based on clinical relevance and included age at first pregnancy. Regarding outcomes related to delivery, individuals in their first pregnancy were excluded.

A two-sided p-value <0.05 was used to determine statistical significance. All analyses were performed using STATA 14.1 software (StataCorp LP, College Station, TX). The study was reviewed by the University of Massachusetts and Brigham and Women's Hospital Institutional Review Boards and was found to be exempt.

3. Results

3.1. Demographics

Of 2363 female physicians enrolled in the study, 1559 were practicing physicians at the time of their most recent pregnancy and were included in this study cohort. Of those included, 400 (25.7%) reported practicing in a procedural field. At least one individual was enrolled from each of the 50 states and the District of Columbia. Women in procedural fields were slightly older at the time of the study and were more likely to report practicing in the

private rather than community setting (Table 1).

3.2. Time to conception and reproductive assistance

There was no significant difference in the reported time to conception, with the majority of women in both the procedural and nonprocedural groups reporting pregnancy within 0–6 months (procedural 67.0% vs nonprocedural 63.1%, Fig. 1). There was also no difference in the type of assisted reproductive technology (ART) used between the 2 groups (Table 2). For both groups, in vitro fertilization (IVF) was the most commonly reported type of ART used, with 39.4% of women in nonprocedural fields and 40.0% of women in procedural fields reporting use. Consultations, intrauterine insemination, and clomiphene use were also common in both groups.

3.3. Pregnancy outcomes and missed work

While the majority of women in both groups reported that their most recent delivery was vaginal, 34.5% of women in the nonprocedural group and 36.0% of women in the procedural group reported undergoing cesarean delivery (c-section, $P = 0.61$, Table 2). Overall 27.3% of women reported missing at least some work due to issues related to their most recent pregnancy outside of maternity leave, with no significant difference seen between the two groups (nonprocedural: 28.2% vs procedural: 24.5%, $P = 0.15$). Overall, 14.6% of women in nonprocedural fields who missed work reported it was due to bedrest compared to 9.6% of women in procedural fields ($P = 0.02$). There was no difference in the proportion of women reporting missing work due to preterm labor between the two groups (nonprocedural: 12.5% vs procedural: 12.3%, $P = 0.91$, Table 2). There was also no difference in the proportion of women reporting missing work related to hyperemesis gravidarum, preeclampsia, neonatal intensive care admission, or other issues (Table 2).

For women who did miss work, women in procedural fields were more likely to report that their partners were primarily responsible for arranging coverage (nonprocedural: 22.6% vs procedural: 41.8%), as opposed to women in nonprocedural fields where coverage was more likely to be arranged by a practice manager (nonprocedural: 19.0% vs procedural: 8.2%, Table 2).

3.4. Adjusted analysis

Adjusting for age at first pregnancy, comparing procedural to nonprocedural fields, there was no difference in the odds of reproductive assistance use (OR 1.12, 95% CI 0.84–1.48, $P = 0.44$), c-section (OR 1.02, 95% CI 0.80–1.31, $P = 0.85$), or missing work due to pregnancy or childbirth apart from maternity leave (OR 0.82, 95% CI 0.63–1.06, $P = 0.13$). There was also no difference seen in the odds of missing work related to preterm labor (OR 0.99, 95% CI 0.69–1.42, $P = 0.96$).

Women in procedural fields were twice as likely to report relying on their partners to arrange coverage during a pregnancy-related absence (OR 2.00, 95% CI 1.39–2.86, $P < 0.001$). They were significantly less likely to rely on a practice manager to arrange coverage (OR 0.54, 95% CI 0.32–0.92, $P = 0.02$). No difference was seen in the odds of relying on a chief or chair (OR 0.85, 95% CI 0.58–1.27, $P = 0.44$) to arrange coverage or being required to do so themselves (OR 1.01, 95% CI 0.70–1.48, $P = 0.92$).

4. Discussion

In this work, we demonstrated that, although proceduralists were slightly older at the time of their first pregnancy, compared to

Table 1
Demographics.

Variable	Nonprocedural (n = 1159)		Procedural (n = 400)		P-Value
	N	%	N	%	
Participant Characteristics					
Current age					
25–30	15	1.3	2	0.5	0.01
31–35	582	50.2	169	42.3	
36–40	454	39.2	188	47.0	
> 40	108	9.3	41	10.3	
Race/Ethnicity					
White	791	68.3	279	69.8	0.30
Black	43	3.7	22	5.5	
Hispanic	35	3.0	10	2.5	
Asian	210	18.1	70	17.5	
Other	80	6.9	19	4.8	
Setting					
Academic	393	34.1	125	31.3	<0.001
Community	335	29.1	78	19.5	
Locum Tenens	4	0.4	1	0.3	
Private	370	32.1	185	46.3	
Rural	27	2.3	7	1.8	
N/A	24	2.1	4	1.0	

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