



Does Participation in Obstetrics and Gynecology Subspecialties Improve Clerkship Outcomes?

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Abstract

Objective The primary objective is to determine if participation in subspecialty rotations during Ob/Gyn core clerkships improves student performance as measured by National Board of Medical Examiners (NBME) Ob/Gyn clinical science subject exam scores, clinical evaluations, and final clerkship summative grades when compared to students without focused subspecialty time.

Methods This is a retrospective study of third-year Alpert Medical School of Brown University (AMS) Ob/Gyn core clerkship students at a single institution (Women and Infants Hospital in Providence, RI) from 2012 to 2017. Participation in Maternal Fetal Medicine (MFM) and/or Gynecologic oncology (Gyn Onc) subspecialty track (a one-week focused experience), NBME Ob/Gyn clinical science subject exam raw score, clinical evaluation score, final clerkship summative grade, and decision to pursue Ob/Gyn as a career were analyzed.

Results There was no significant difference in NBME scores or final clerkship summative grade when comparing general track students to the subspecialty track. There was a significant difference in the clinical evaluation scores between general track and sub-specialty track students ($p < 0.002$). Of the students who pursued an Ob/Gyn residency, 75% participated in a subspecialty track.

Conclusion Exposure to subspecialty fields is not uniform during core clerkships. Our study indicates that using core clerkship time for early subspecialty exposure does not negatively impact student outcomes, and potentially improves clinical evaluations.

Keywords Medical education · Curriculum development · Obstetrics and gynecology

Introduction

Traditional medical school curriculum consists of two years of classroom-based basic science training and two years of hands-on clinical training. The core clerkship rotations, generally in the third year of medical school, usually serve as the first exposure for students to subspecialties. It is evident that clerkship rotations are a critical part of medical students'

training and can be a formative time for decision making regarding future specialty choice. Studies examining medical student specialty selection have noted that clerkships influence students' decisions to pursue a career in that field [1]. At Alpert Medical School of Brown University (AMS) clerkship performance is assessed through a combination of National Board of Medical Examiners (NBME) Ob/Gyn clinical science subject examination scores, faculty/resident evaluations, and Objective Structured Clinical Examination (OSCE) scores. Student performance in a clerkship has been correlated to previous performances on the Medical College Admission Test (MCAT), United States Medical Licensing Examination Step 1 (USLME), and high-quality faculty teaching and feedback [2–4].

Major core clerkship rotations (i.e., medicine, surgery, obstetrics and gynecology, pediatrics, and psychiatry) often leave little time for subspecialty exposure [5, 6]. Traditional obstetrics and gynecology (Ob/Gyn) clerkship rotations are often organized with a focus on general obstetrics and general gynecology experiences. At some institutions, these general

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experiences may limit exposure to subspecialty fields such as Maternal Fetal Medicine (MFM), Female Pelvic Medicine and Reconstructive Surgery (FPMRS), Reproductive Endocrinology and Infertility (REI), and Gynecologic Oncology (Gyn Onc). This can potentially lead to missed educational opportunities to include students on subspecialty teams with possibly more individualized teaching which could potentially impact student performance.

There is limited research evaluating the effect of subspecialty rotations in Ob/Gyn clerkships on student performance. However, parallels can be drawn from research in general surgery where limited exposure to subspecialty services results in the primary burden of education being placed on the few available general surgery faculty. This leads to a larger student to faculty ratio and may result in limited opportunity for individualized instruction [7]. Dutta et al. examined the use of “mini-rotations” in surgical subspecialties and restructuring surgical rotations to include more specialized experiences. They found that exposure to a two-week pediatric surgery rotation provided students with adequate competency in key pediatric educational objectives and that overall students reported a statistically significant improvement in their exposure to pediatric surgery topics [8]. Weber et al. noted that even a two-day mini rotation on vascular surgery significantly improved student’s medical knowledge [9].

There is limited research in the field of Ob/Gyn regarding subspecialty exposure and its impact on clerkship rotations. In the academic years of 2012–2017, students rotating through the AMS Ob/Gyn third-year clerkship were offered a unique opportunity to participate in an Ob/Gyn subspecialty focused experience of MFM and/or Gyn Onc. The primary objective of this study was to determine if participation in these subspecialty rotations improves student performance as measured by the NBME Ob/Gyn clinical science subject exam, clinical evaluations, and final clerkship summative grades when compared to students who did not have this focused subspecialty time. Our secondary objective was to determine whether participation in subspecialty rotations influences students’ decisions to pursue a career in Ob/Gyn.

Methods

This is a retrospective study of AMS third-year medical students who rotated through the six-week Ob/Gyn core clerkship at Women and Infants Hospital (WIH) in Providence, Rhode Island during the June 2012–April 2017 academic years. The study was approved by the Institutional Review Board of Women & Infants Hospital of Rhode Island (Providence, RI).

All AMS students who rotated through the Ob/Gyn core clerkship during the 2012–2017 academic years were included. WIH is the only clinical site for AMS core clerkship students. For the student’s obstetrics experience, clerkship scheduling

included an option to participate in a general obstetrics track or a MFM track. The general track consisted of two weeks of general low-risk obstetrics on the labor and delivery floor at WIH. The MFM track consisted of one week of general low-risk obstetrics and one week of inpatient obstetrical care with the MFM team at WIH. During the general obstetrics experience, students were responsible for postpartum rounding and labor management for low-risk obstetrics patients. Clinical learning during this portion was primarily led by residents, community-based faculty, academic generalists, and certified nurse midwives. During the student’s MFM experience, students rounded on inpatient high-risk obstetrics patients and participated in the labor management for the high-risk patients. Obstetrical teaching for the MFM week was performed by the MFM attending, MFM fellow, and the MFM resident.

For the gynecologic experience, clerkship scheduling included an option to participate in a general gynecology track or a Gyn Onc track. During their operative experience, students did not participate in FPMRS procedures. Additionally, there is no minimally invasive gynecologic surgery division at WIH. The general track consisted of two weeks of benign gynecology in the operating rooms at WIH. Procedures during this week are led by community-based faculty and academic generalists. Procedures included hysteroscopy, laparoscopy, and open abdominal cases. Indications for these surgeries may include abnormal uterine bleeding, fibroid uterus, and pelvic pain. Students participated in the patient’s preoperative, intraoperative and postoperative care. The Gyn Onc track consisted of one week of benign gynecology in the operating rooms at WIH and one week of with the Gyn Onc team at WIH. During the oncology portion of the rotation, students participated in oncologic operative cases, postoperative management, and medical admissions related to the patient’s cancer complications. Teaching during this was led by Gyn Onc attendings, Gyn Onc fellows, and residents participating in their oncology rotation.

For each of the above track options, prior to the start of the Ob/Gyn rotation, students were able to self-select into these tracks. If not enough students self-selected into the MFM or Gyn Onc track for a clerkship rotation, students were randomly assigned to these tracks by the clerkship coordinator to even out each of the tracks. The MFM track was available to students from 2012 to 2017, and the Gyn Onc track was available to students from 2015 to 2017. Review of student files was completed to collect the following information for each student: participation in MFM and/or Gyn Onc track, NBME Ob/Gyn clinical science subject raw score, clinical evaluation score, final clerkship summative grade, and decision to pursue Ob/Gyn as a career.

When analyzing the data, there was no way to discern if students self-selected to participate in the MFM or Gyn Onc track or were assigned a track. Student NBME scores range from 0 to 100. Clinical evaluation scores are numerical scores

calculated by weighing faculty and resident clinical evaluations completed for the clerkship, and range from 0 to 100. Final summative clerkship grades were determined by a final summation of clinical evaluations, NBME scores, student case presentation score, and student OSCE score with a numerical cut off for honors, satisfactory, and existing deficiency (ED). All data that was collected was de-identified. Categorical variables were compared by Fisher’s exact test. Continuous variables were compared using *t* test or Wilcoxon rank-sum for twogroups and ANOVA or Kruskal-Wallis for three groups. Data analysis was performed with Stata/SE 15.0 (College Station, TX).

Results

A total of 560 AMS medical students rotated at WIH during the study period. Complete data was identified for 474 students who were included in the study. Eighty-six student records were excluded given inability to find their clerkship assignments and therefore inability to see if they participated in the general or subspecialty tracks. Two hundred fourteen students completed a “General track” (neither a MFM nor Gyn Onc track), 139 students completed a MFM track, 69 students completed a Gyn Onc track, and 59 students completed both a MFM and Gyn Onc track (Table 1). There were 45 total students who entered Ob/Gyn residency after their graduation from AMS. Of these students, 75% participated in a subspecialty track.

When comparing students in the general track to students in the subspecialty track, there was no significant difference in NBME Ob/Gyn clinical science subject scores and final clerkship summative grade, although there was a trend of higher NBME scores and higher percent clinical honors for the students who completed a subspecialty track (Table 1). There was a significant difference in the clinical evaluation score ($p < 0.002$) for students in subspecialty track compared to the general track. Students who participated in MFM/Gyn Onc track had the highest clinical evaluation scores with a

mean of 87.7 (SD 5.5) compared to students who participated in the general track with mean clinical evaluation scores of 84.0 (SD 7.9). Tables 2, 3, and 4 depict a stepwise pairing comparison of the NBME Ob/Gyn clinical science subject score, final clerkship grade, and clinical evaluation. In a stepwise pairing comparison (Table 4) of the general track to each subspecialty track, there was a statistically significant difference in the clinical evaluation score in the MFM and MFM/Gyn Onc track ($p < 0.001$). There was a trend towards significance for the Gyn Onc track.

Discussion

There is limited research in the field of Ob/Gyn regarding subspecialty exposure and its impact on clerkship rotations. A study in general surgery suggested that faculty had concerns regarding the ability of a short sub-specialized rotation in providing adequate clinical exposure, its effectiveness in affording acceptable medical competency, and lastly its efficacy in generating interest in surgery as a future career [8]. Our study indicates that participation in subspecialty tracks resulted in comparable clerkship outcomes compared to students who participated in the general tracks. Therefore, exposing students to subspecialty rotations does not have a negative impact on their clerkship experience and could potentially increase interest in the field.

Our data show a statistically significant difference in the clinical evaluation scores for students who participated in subspecialty tracks. Studies have shown that clinical evaluations have a larger impact on identifying surgical interest and eventual matriculation into that specific field when compared to performance on academic examinations [3, 10]. Increased clinical evaluation scores in our study may be attributed to a subspecialty service having a smaller team setting where medical students have increased familiarity and contact time with attendings and residents. This in turn may create stronger more noteworthy relationships which may result in better

Table 1 Summary of NBME Ob/Gyn clinical science subject score, final clerkship summative grade, and clinical evaluation score

<i>N</i> = 474	General OB/Gyn (<i>n</i> = 214)	MFM (<i>n</i> = 139)	Gyn Onc (<i>n</i> = 69)	MFM and Gyn Onc (<i>n</i> = 52)	<i>p</i> value
NBME score (0–100) Mean (SD)	76.9 (8.7)	76.7 (8.6)	77.7 (6.1)	79.1 (7.6)	0.28 ¹
Final clerkship summative grade					
ED	1	3	0	0	
Satisfactory	145	86	48	30	0.31 ²
Honors	68	50	21	22	
Clinical evaluation score (0–100) Mean (SD)	84.0 (7.9)	86.7 (7.6)	85.4 (7.4)	87.7 (5.0)	0.002 ³

¹ ANOVA

² Fisher’s exact test

³ Kruskal-Wallis

Table 2 NBME Ob/Gyn clinical science subject examination score pairwise *p* values (Scheffé)

<i>N</i> = 474	General Ob/Gyn	MFM	Gyn Onc
MFM	0.99	–	–
Gyn Onc	0.92	0.86	–
MFM and Gyn Onc	0.41	0.36	0.85

clinical evaluations. However, there is a possibility that students who self-selected into the subspecialty tracks have a higher interest in the subject matter. This may result in more motivation to succeed in the career and therefore better performance on the clinical evaluations regardless of the small team setting.

With regard to subspecialty exposure generating interest in an Ob/Gyn career, our findings indicate that 75% of students who applied to Ob/Gyn residency had participated in a subspecialty track. This may be explained in several ways. First, it is possible that participation in the subspecialty tracks increased student exposure to Ob/Gyn which ultimately led the student to apply into the field. Previous studies show that medical student satisfaction and decisions to pursue a career in a surgical field are related to the student having an active role within the clinical team, increased hands-on operative skills, and participating directly in patient examinations [1, 11]. A smaller team setting in the subspecialty tracks may have promoted a similar active clinical role. However, we are unable to know which students were assigned to the tracks versus those who selected the tracks. Therefore, an additional explanation is that students who had a prior interest in Ob/Gyn and were already planning to pursue a career in the field and self-selected into the subspecialty tracks.

In order to determine if student self-selection influences clinical evaluation scores and future decision to pursue a career in Ob/Gyn, an additional study would need to identify which students self-selected into the subspecialty tracks. Additional research would also need to be completed to analyze NBME outcomes specifically related to MFM and Gyn Onc questions to determine if students who participate in these subspecialty tracks performed better in these subject areas. Lastly, there was no data gathered regarding student and staff perceptions of subspecialty rotations, their impact on learning, and influences on clinical evaluations in order to assess if

Table 3 Final clerkship summative grade pairwise *p* values (Fisher's exact test)

<i>N</i> = 474	General Ob/Gyn	MFM	Gyn Onc
MFM	0.21	–	–
Gyn Onc	0.91	0.40	–
MFM and Gyn Onc	0.35	0.51	0.12

Table 4 Clinical grade pairwise *p* values (Wilcoxon rank-sum)

<i>N</i> = 474	General Ob/Gyn	MFM	Gyn Onc
MFM	0.001	–	–
Gyn Onc	0.08	0.39	–
MFM and Gyn Onc	0.001	0.47	0.15

subspecialty rotations increase exposure to clinical experiences and faculty/residents.

Strengths of this study include that this is the only study that has examined the effect of a subspecialty curriculum in the third-year Ob/Gyn clerkship. An additional strength is that the study had a large sample size. Limitations include that it is a retrospective chart analysis at a single site and that it is not possible to determine which students self-selected into subspecialty tracks and those who were assigned these tracks. In addition, we do not have access to the NBME questions to assess how many questions in the test are related to Gyn Onc or MFM and to see if students who participated in the subspecialty tracks had improved outcomes for these particular questions.

Medical school curricula vary across the country and may not include subspecialty rotations; therefore, exposure of medical students to the subspecialty fields is not uniform. Subspecialty exposure largely depends on fourth-year electives when major decisions regarding residency training have already been made. A multi-center study noted that 70% of respondents chose to become obstetrician-gynecologist after their third-year core Ob/Gyn clerkship [12]. By altering third-year Ob/Gyn clerkship curricula, a pivotal time in a medical student's career, to include subspecialties we are potentially harnessing an opportunity to attract medical students to the field.

The goal of our research was to assess the impact of subspecialty training in Ob/Gyn clerkships. This is the first analysis showing that medical students in an Ob/Gyn clerkship who participate in a subspecialty track do not perform worse than those participating in the traditional general track. These subspecialty tracks have the potential for increasing student exposure to the field of Ob/Gyn and desire to pursue the career in the future. This work can be extrapolated to other fields of medicine where clerkship experiences integrate exposure to subspecialties.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This study was approved by the Institutional Review Board of Women & Infants Hospital of Rhode Island (Providence, RI).

Informed Consent Informed consent for review of student grades was waved by the IRB.

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