Original Study

Pediatric and Adolescent Gynecology Education through Simulation (PAGES): Development and Evaluation of a Simulation Curriculum

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A B S T R A C T

Study Objective: Develop a Pediatric and Adolescent Gynecology (PAG) curriculum, appropriate pelvic model for teaching examination skills, and an objective structured clinical examination (OSCE) for evaluation. Compare OSCE performance between residents with clinical training in PAG vs those that completed the curriculum vs those without either experience.
Design: Prospective cohort study.
Setting: Obstetrics and Gynecology (Ob/Gyn) residency program in an urban academic center.
Participants: Senior Ob/Gyn residents.
Interventions: A simulation-based teaching curriculum was created to teach PAG skills. A pediatric mannequin with anatomic pre-pubertal genitalia was developed for teaching and assessment of skills.
Main Outcome Measures: Performance on a PAG-based OSCE as assessed by 2 observers using a 40 point checklist.
Results: 17 residents participated in the OSCE; 5 completed the curriculum, 6 completed a clinical rotation, and 6 were controls. The teaching curriculum group had the highest median composite OSCE score (75.0%) compared to the clinical group (73.1%) and control group (55.3%). There was no statistical difference between the scores of the teaching and clinical groups, but the teaching group scored statistically higher than controls ($P = .0331$). Scores for each OSCE component were compared. The teaching and clinical groups outperformed controls on assessment and procedures. There was no difference in scores on history taking or physical examination.
Conclusion: An interactive teaching curriculum incorporating simulation and a realistic pediatric pelvic model can be used to teach PAG clinical skills. Using an OSCE to evaluate skills shows that residents completing the curriculum perform as well as those with clinical experience and better than controls.
Key Words: Objective structured clinical examination, Pediatric and adolescent gynecology, Resident education, Simulation

Introduction

Pediatric and Adolescent Gynecology (PAG) is a relatively new subspecialty which encompasses a wide range of gynecologic pathology in young girls and adolescents. A specialist in this area has knowledge in all aspects of gynecologic care for young girls from preventive adolescent care to surgical intervention for genitourinary anomalies. The Council for Resident Education in Obstetrics and Gynecology (CREOG) provides educational objectives for residency training and includes pediatric and adolescent gynecology as a required subject.[1] Questions pertaining to the unique problems of this patient population frequently show up on CREOG and the American Board of Obstetrics and Gynecology (ABOG) examinations. More importantly, general gynecologists may be called upon by community pediatricians, surgeons, and urologists to consult for pediatric patients with gynecologic problems. Unfortunately, few Ob/Gyn residency programs provide formal training in this subspecialty either due to lack of qualified faculty or infrequent encounters with this patient population. A recent survey of Ob/Gyn residency programs revealed that 83% of respondents did not have a formal, dedicated PAG rotation.[2]

Simulation in medical education is a rapidly growing field. It provides the opportunity for trainees to master basic skills prior to real world application and exposure to management of more rare conditions that may not frequently arise during clinical training. In the field of Ob/Gyn, successful simulation models have been developed to train physicians to handle emergencies such as shoulder dystocia, vaginal breech delivery, and postpartum hemorrhage as well as surgical skills such as hysteroscopy and laparoscopy.[3–7] In the field of PAG, there is only 1 published study in the literature describing the use of simulation to teach the skills necessary to evaluate and care for pediatric

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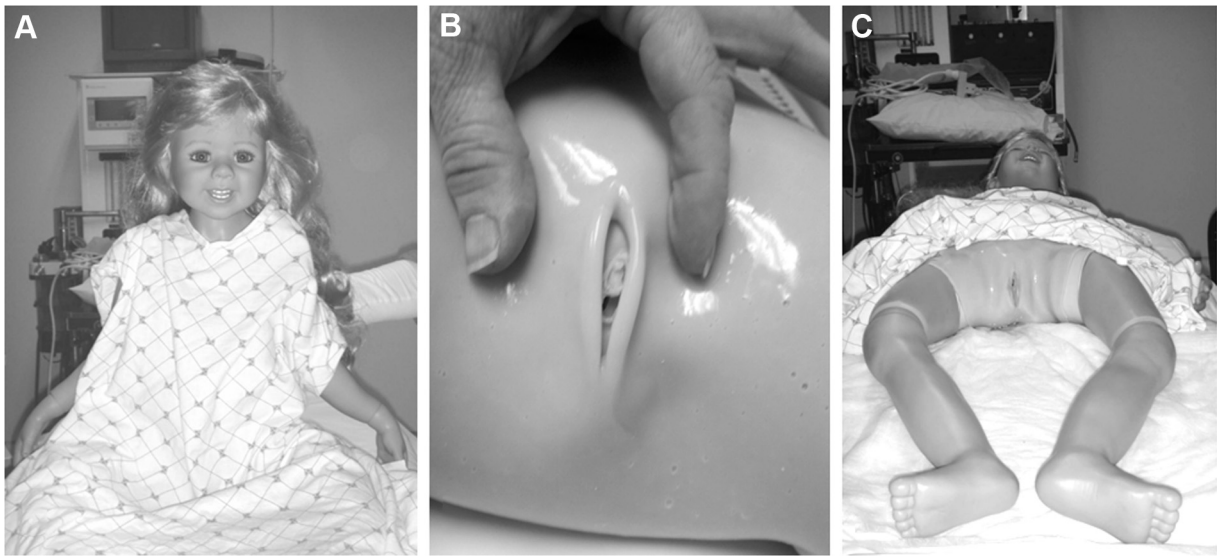

Fig. 1. Pediatric gynecology teaching model. A, Life-size commercial doll used to create pelvic teaching model; B, External genitalia created with latex; C, External genitalia overlay in place and legs in position for proper examination.

patients with gynecologic complaints.[8] This was a study of 19 resident physician participants that compared performance on an objective structured clinical examination (OSCE) before and after a formal lecture during which examination technique was taught. The study showed improvement in the OSCE scores after participants attended the lecture and demonstration.

Although the aforementioned study showed that participants performed better on an OSCE after a teaching intervention than prior to the intervention, we sought to compare performance on OSCE between Ob/Gyn residents with clinical exposure to pediatric and adolescent gynecology, those who completed a simulation teaching curriculum and a control group without either experience. Our goal was to develop an appropriate teaching curriculum which could be implemented in training programs without the ability to establish a formal clinical rotation in PAG and determine if the curriculum was effective in teaching the necessary skills to properly evaluate and treat pediatric gynecology patients.

Materials and Methods

This study had 2 objectives. First was to develop a PAG simulation teaching curriculum, appropriate pelvic model for teaching examination skills, and an assessment tool to evaluate participants' skills. The second was to compare performance on an objective structured clinical examination (OSCE) between senior residents with clinical training in PAG versus those that completed the simulation teaching curriculum versus those that had neither experience. This study was approved by the MedStar Health Research Institute's Institutional Review Board and informed consent was obtained from all participants prior to enrollment.

Development of a Teaching Curriculum and Pelvic Model

We designed a teaching curriculum, Pediatric and Adolescent Gynecology Education through Simulation (PAGES), to teach the basic principles of evaluation and management of common gynecologic complaints in prepubertal girls. The curriculum included 2 online lectures viewed prior to a live session. One lecture was recorded by the senior author (V.G.L.) and covered common vulvar complaints in prepubertal girls. The second lecture was recorded by another author (A.M.J.) who is a specialist in child physical and sexual abuse and covered aspects of history taking and examination of children with suspected sexual abuse.

The live portion of the PAGES curriculum was a half day session during resident didactic time in the simulation laboratory led by the study authors: PAG fellow (L.F.D.), PAG faculty (V.G.L.) and pediatric physical and sexual abuse specialist (A.M.J.). The session covered a variety of topics including approach to the pediatric patient, prepubertal female genital anatomy, proper examination techniques and positioning, and procedural skills of culture collection, vaginal irrigation, and vaginoscopy. The session included hands on demonstrations of skills and a simulated patient encounter for each participant.

To create a pelvic model, a life size toddler doll was purchased from a commercial retailer (Fig. 1, A). The hip joints of the doll were modified to allow for better external rotation and leg positioning. The vaginal canal and cervix were created from recycled components of a hysteroscopy model. A latex mold was used to create external genitalia including the labia majora, labia minora, clitoral hood, urethral opening, and hymen (Fig. 1, B). The latex mold was draped over the perineum of the doll and attached anteriorly and posteriorly above the hips to hold the external anatomy in place (Fig. 1, C). The mold was created in this manner to allow for replacement if the latex hymen or other structures become damaged. Costume makeup was used to create erythema of the labia as needed. The model was used during the teaching session for demonstrating positioning, examination techniques, and procedural skills.