Improving the Assessment and Treatment of Pelvic Inflammatory Disease Among Adolescents in an Urban Children's Hospital Emergency Department

Authors: Colleen A. McCallum, DNP, RN, FNP-C, Kathleen S. Oman, PhD, RN, FAEN, FAAN, and Mary Beth Flynn Makic, PhD, RN, CNS, CCNS, FAAN, Denver, CO

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Introduction: Proper pelvic inflammatory disease (PID) assessment and treatment is essential in preventing ectopic pregnancies, repeated PID infections, infertility, chronic pelvic pain, and fetal death. This project measured the effectiveness of interventions directed toward the providers in the emergency department to facilitate a change in the assessment and treatment of PID. Two aims identified for the project included increasing the number of providers who recorded a correct diagnosis of PID in the chart and included a sexual history for female adolescents who presented to the emergency department with abdominal pain. An additional aim was to increase the percentage of adolescents who received the correct treatment for PID.

Methods: A quality improvement study using pre-post design and Plan-Do-Study-Act cycles over an 18-month period was conducted in the emergency department of an urban children's hospital. Assessment of adolescent female patients' history of recent sexual activity and correct diagnosis and treatment of PID were evaluated. Process improvement interventions consisted of PowerPoint presentations, educational materials, and Centers for Disease Control and Prevention (CDC) treatment guidelines posted in provider areas (Table 1), along with ongoing positive and corrective feedback to providers.

Results: A total of 602 patient records were reviewed (119 in the PID diagnosis and treatment arm and 483 in the obtaining sexual history arm). After process improvement interventions, correct PID diagnosis increased from 72% to 95% ($z = 3.064$, $P = .00109$, odds ratio [OR] = 7.08). Correct PID treatment increased from 39.3% to 79.3% ($z = 4.190$, $P = .0000139$, OR = 5.90). The percentage of providers who obtained a sexual history increased from 65% to 74.2% ($z = 1.892$, $P = .02929$, OR = 1.55).

Discussion: The study demonstrated a significant improvement in all 3 aims related to improved care of adolescents with PID. PowerPoint presentations and the physical presence of the CDC treatment guidelines in the provider treatment areas were instrumental for success. Nurses play a pivotal role in the implementation and success of quality improvement projects for improving patient outcomes.

Key words: Pelvic inflammatory disease; Adolescents; Emergency department; Provider barriers; Treatment guidelines

Colleen A. McCallum is Clinical Instructor, Pediatric Emergency Medicine, University of Colorado Health Sciences Center School of Medicine, Children's Hospital Colorado, and Assistant Professor, Regis University, Denver, CO.

Kathleen S. Oman, *Member, Colorado ENA Chapter*, is Research Nurse Scientist, University of Colorado Hospital, and Associate Professor, Adjoint, University of Colorado College of Nursing, Denver, CO.

Mary Beth Flynn Makic is Research Nurse Scientist, Critical Care, University of Colorado Hospital, and Associate Professor, Adjoint, University of Colorado College of Nursing, Denver, CO.

For correspondence, write: Colleen A. McCallum, DNP, RN, FNP-C, Regis University, 3333 Regis Blvd, Mail Stop G-8, Denver, CO 80221–1099; E-mail: cmccallu@regis.edu.

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Pelvic inflammatory disease (PID) affects approximately 1 million women each year in the United States[1] and is one of the most common serious infections of nonpregnant women of reproductive age.[2] Approximately 340,000 to 410,000 cases of PID are diagnosed annually in emergency departments,[3] and the direct costs of PID treatment exceed $2 billion every year.[2] The sequelae of untreated PID are extensive, with significant longitudinal morbidity. These health outcomes, including chronic pelvic pain, ectopic pregnancy, infertility, fetal death, repeated PID infections, hospital admissions, and repeated ED visits, can be especially detrimental to adolescent health.[1,4-6] One study reports that after a single episode of PID, a serious long-term complication will develop in 1 in 4 women.[5]

PID is an ascending polymicrobial genital tract infection that occurs in sexually active females and can

include several inflammatory disorders, such as endometritis, parametritis, salpingitis, oophoritis, tubo-ovarian abscess, peritonitis, and perihepatitis. PID can also develop into Fitz-Hugh–Curtis syndrome, a condition in which bacteria from the pelvic infection spreads through the abdomen and causes inflammation of the tissue surrounding the liver. The causative agents of PID are usually gonorrhea (GC) and Chlamydia trachomatis (CT), but microflora from the vagina and bowel may also contribute to the development of this disease.[7]

Acute PID can be difficult to diagnose because of a wide variation in signs and symptoms. Consequently, many women with PID may have mild or subtle symptoms. Many episodes of PID are not recognized because the patient or health care provider fails to appreciate the implications of mild or nonspecific symptoms. Delay in treatment can have dire inflammatory consequences in the upper reproductive tract. Providers should maintain a low threshold of suspicion for the diagnosis of PID and treat even the most subtle of symptoms.[8]

The pelvic examination is the most important assessment technique in detecting PID and is required for any female patient with pelvic or abdominal pain. One study[8] reported that 20% to 50% of female patients presenting with pelvic pain have PID. Twenty percent of PID cases occur in females younger than 19 years, and PID will develop in 1 in 8 female adolescents compared with 1 in 80 women aged 24 years[4] because of a combination of biological and social factors.[4] Adolescents acquire PID at higher rates because of these factors and thus are considered a more vulnerable population.

During the past 2 decades, studies have shown that rates of adherence by ED providers to the Centers for Disease Control and Prevention (CDC) treatment guidelines for PID range between 32% to 35%.[9-11] A goal of Healthy People 2010 was to have at least 90% of primary care providers manage sexually transmitted infections (STIs) correctly by 2010.[3] Several opportunities for treating STIs and PID correctly are missed, especially in female adolescents. Therefore accurate assessment, diagnosis, and treatment of PID are essential to maintain adolescent reproductive health.

The providers in an urban children's hospital adolescent clinic noticed an alarming trend in adolescents who presented for PID follow-up from the emergency department. Some of the adolescents did not receive the correct antibiotic regimen according to the CDC guidelines, and several were incorrectly diagnosed. Some adolescents did not receive a pelvic or bimanual examination, and a few did not receive GC and CT testing.

A needs assessment was conducted by the Advanced Practice Registered Nurse (APRN) to determine the feasibility of this project compared with other quality improvement (QI) projects. The findings from the needs assessment were presented by the APRN to members of the QI committee in the emergency department to determine how to proceed. A quality improvement project (QIP) was developed to address the gaps in care of the treatment of adolescents with PID seen in the emergency department. The QI medical director found that this project was needed, worthwhile, and viable. The members of the team consisted of the APRN team leader, the QI medical director of the emergency department, and the QI nursing director of the emergency department. The APRN was positioned in a unique and ideal role to be able to (1) identify problems in the clinical area, (2) strategize how to problem solve, (3) ascertain the most effective plan-do-study-act (PDSA) cycles to perform, (4) re-evaluate the cycles, (5) offer suggestions to the team to model, and (6) make recommendations for best practice using evidence-based guidelines.

Baseline data collected for correct PID treatment according to the CDC guidelines in this emergency department for 2010 and the first quarter of 2011 averaged 34%. The project team decided that 70% compliance with appropriate PID treatment was an appropriate goal. Another problem the team noticed was that many providers did not obtain a sexual history for female adolescents who presented to the emergency department with abdominal and pelvic pain. Baseline data collected in March 2011 revealed that providers obtained a recent sexual history only 50% of the time.

This QIP was designed to determine if assessment and treatment for PID improved after educational changes were made in the emergency department and if more adolescent females presenting to the emergency department with abdominal pain were asked about their sexual history. The overall goal was to improve ED care for adolescent female patients with PID. Specific aims of the project included:

1. Increase the percentage of providers who record a correct diagnosis of PID from 70% to 90%
2. Increase the percentage of adolescents who receive the appropriate treatment for the diagnosis of PID according to the CDC guidelines from 34% to 70%
3. Increase the number of providers who take a recent sexual history as part of ED care for adolescent females presenting with abdominal or pelvic pain from 50% to 75%

The overarching theoretical framework guiding this project was Rogers' Diffusion of Innovations Theory,[12] which discusses stages of progression for organizations as they execute change. Implementation of new ideas can take several years from the initial stages to the adoption phase.