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Quality Improvement: Changing Patterns of Antibiotic Prophylaxis for Surgical Abortion

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Purpose

Evaluate the effect of quality improvement interventions on antibiotic utilization and preoperative documentation for women undergoing an abortion in the operating room at our academic institution. A prior quality evaluation of antibiotic utilization by women who had abortions in our operating room from April 2012 to June 2013 revealed suboptimal antibiotic adherence and poor physician documentation. To address these issues, we recommended patients to fill prescriptions at the pharmacy located in the same building as our clinic and created a standard preoperative template for the medical record. We reexamined outcomes for women having abortions from April 2014 to June 2015.

Review of the Literature

Twenty-one percent of all pregnancies (excluding miscarriages) in the United States end in abortion with at least a million abortion procedures occurring annually (Jones and Jerman, 2014). The prevalence of infections after abortions in both the first and second trimesters ranges widely from 0.1% to 4.7% (Achilles and Reeves, 2012; American College of Obstetricians and Gynecologists, 2013). Both the American College of Obstetricians and Gynecologists and the Society of Family Planning endorse the use of prophylactic antibiotics to reduce infection after surgical abortions (American College of Obstetricians and Gynecologists, 2013; Low et al., 2012; Sawaya et al., 1996). Little is known about adherence to such treatment for women who have abortions in a setting that requires them to obtain antibiotics at

Objective: Postprocedure infection complicates nearly 5% of abortions. Multiple organizations endorse prophylactic antibiotics to reduce infection risk with surgical abortion, but the adherence rate remains unknown for women who obtain antibiotics at a pharmacy and take them at home before their procedure. Our objective was to evaluate the effect of quality improvement interventions on antibiotic utilization and preoperative documentation for women undergoing surgical abortion at our academic institution.

Methods: An initial quality evaluation of antibiotic utilization by women who had abortions in our operating room between April 2012 and June 2013 revealed suboptimal antibiotic adherence and poor physician documentation. To address these issues, we recommended patients to fill prescriptions at the pharmacy located in the same building as our clinic and created a standard preoperative template for the medical record. We reexamined outcomes for women having abortions from April 2014 to June 2015.

Results: Antibiotic adherence increased from 81% to 90% ($p < .001$). The proportion of patients not receiving antibiotics decreased from 2.4% to 0.5% ($p = .01$). Adherence documentation rates improved from 69% to 99% ($p < .001$).

Conclusions: Using an easily accessible pharmacy and a standard preoperative template improves utilization of prophylactic antibiotics for patients undergoing abortions in the operating room.

a pharmacy and take them at home before their procedure.

At our institution where women follow such preoperative procedures, women can obtain an abortion during the first trimester in an office setting and in the first and second trimester (until 23 weeks 6 days gestation) in the operating room. In this report, we evaluate the effect of quality improvement interventions on antibiotic utilization and preoperative documentation of patient adherence for women having an abortion in the operating room.

Keywords

abortion
medication adherence
prophylactic antibiotic
quality improvement
standard template

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Table 1. Demographics of Women Having an Abortion in the Operating Room Before and After Initiation of Quality Improvement Interventions^a

	Before interventions April 2012–June 2013 (n = 252)	After interventions April 2014–June 2015 (n = 444)	<i>p</i> -Value
Age, years, mean ± <i>SD</i>	28.0 ± 6.8	28.0 ± 6.8	.82
Gestational age, <i>n</i> (%)			.54
First trimester (≤14 weeks)	49 (24.1)	77 (17.3)	
Second trimester	203 (75.9)	367 (82.7)	
Race, <i>n</i> (%)			.048
White	72 (28.6)	162 (36.5)	
Black	54 (21.3)	115 (25.9)	
Other	42 (16.7)	152 (34.2)	
Unknown	84 (34.9)	15 (3.4)	
Primary language, <i>n</i> (%)			.14
English	193 (76.6)	417 (93.9)	
Non-English	3 (1.2)	16 (3.6)	
Unknown	56 (22.2)	11 (2.5)	
Insurance, <i>n</i> (%)			.57
Private	67 (26.6)	127 (28.6)	
Medicaid	185 (73.4)	317 (71.4)	
Prescription sent to pharmacy in clinic building	76 (30.2)	272 (61.3)	<.001

^aThe interventions were quality improvement measures to improve antibiotic utilization and documentation prior to surgical abortion in an operating room setting. The interventions included the use of a standard preoperative documentation template and physician recommendation for patients to use the pharmacy located in the outpatient clinic building.

Study Design and Methods

At our academic institution, patients having a surgical abortion in the operating room routinely have a preoperative visit 1 day before the scheduled procedure. They are prescribed prophylactic antibiotics to pick up at a pharmacy and use the night before the procedure. We performed an initial quality evaluation of antibiotic utilization and physician documentation in 2013 with a retrospective electronic medical record (EMR) chart review of women who had surgical abortions in the operating room from April 2012 to June 2013 (Shorter et al., 2014). The April start date was approximately 6 months after opening a new abortion service at our institution. During this period, the physician seeing the patient for her preoperative evaluation submitted an electronic antibiotic prescription to a pharmacy of the patient's choice. On the day of surgery, a physician

seeing the patient in the preoperative area documented any updates to the history and physical. If a patient reported not taking the antibiotic, physicians ordered antibiotics to be given immediately in the preoperative area or in the operating room.

Following the initial quality assurance assessment, which showed poor patient adherence and documentation (Shorter et al., 2014), we made two changes in our preoperative procedures. First, we created a standard EMR template for physician documentation of updates to the history and physical on the day of surgery, which includes a section specifically addressing whether the patient took her prescribed antibiotics. Second, after the EMR template was implemented in the fall of 2013, we recommended that patients obtain their prescriptions at the pharmacy located in the same building as our outpatient clinic. To assess the outcomes of

these interventions, we performed a second quality evaluation of abortions performed from April 2014 to June 2015. Herein, we report the results of both quality evaluations.

We used preoperative clinic schedules to identify women who had a surgical abortion during the respective time periods. Patients who refused antibiotics were excluded from this analysis. The abortions of women who had at least one procedure before and after our interventions were counted as independent events. We confirmed abortion procedures and collected data regarding demographic information, patient adherence, and antibiotic administration from the EMR. We assumed that the patient used antibiotics if documented in a physician's note or reported in the medication administration record.

Our outcome measures were patient adherence rates, overall rates of antibiotic administration, and documentation rates. We used *t*-tests, Chi-square tests, and Fisher's exact tests as appropriate. Data were analyzed using SAS 9.3 (Cary, NC).

Institutional Review Board Approval

This study was considered exempt by the Institutional Review Board at our institution.

Results

We identified 252 patients who had an abortion in the operating room from April 2012 to June 2013 and 445 patients who had abortions from April 2014 to June 2015. We excluded one patient in the latter group who refused antibiotics, resulting in 696 women for our study. Population characteristics from both study periods are presented in Table 1. The mean gestational age of patients in the 2 evaluation periods were 17.4 ± 4.1 weeks and 18.0 ± 4.3 weeks, respectively ($p = .073$).

Documentation rates of patient adherence to prescribed antibiotics improved from 69.4% (175 of 252) in the first analysis period to 99.1% (440 of 444) in the second period ($p < .001$). Among patients

who were prescribed antibiotics and had adherence documentation, antibiotic use the night before the procedure increased from 81.1% (137 of 169) to 90.2% (396 of 439) ($p < .001$). For nonadherent patients, antibiotic administration in the preoperative area increased from 84% (27 of 32) to 98% (42 of 43) ($p = .08$). The proportion of patients who received no antibiotics decreased from 2.4% (6 of 252) to 0.5% (2 of 444) ($p = .01$).

Limitations

Because we introduced two quality-driven interventions around the same time, we cannot assess how much the preferential but not exclusive use of a particular pharmacy or the use of a standard EMR template contributed to the outcome improvements.

We did not assess postprocedure infection rates in this population because the benefits of prophylactic antibiotics for decreasing postprocedure infection are well documented (American College of Obstetricians and Gynecologists, 2013; Low et al., 2012; Sawaya et al., 1996). Additionally, we believe that attempting to determine infection rates in our population may be inaccurate because as a referral center, we serve a large catchment area, which makes it possible for women who developed a postabortal infection to receive care outside our system.

While we found improvements in nearly all our outcomes after encouraging patients to use the pharmacy located in the same building in which the preoperative visit occurred and implementing a standard EMR template, our results may not be generalizable for practices outside of large academic institutions like ours. The majority of elective surgical abortions in the United States are performed in freestanding abortion clinics where patients may only have a single appointment for the procedure depending on their gestational age (Jones and Jerman, 2014). For clinics that perform abortions in a single visit, assessing patient adherence to antibiotics used the night

before the procedure would not be applicable. Another limitation is that our results are based on the assumption of accurate documentation. In addition, patients who received an abortion from 2014 to 2015 were not exclusive of abortion patients from 2012 to 2013. Since the same patient may be analyzed in both groups, the impact of our interventions on patient adherence may be overrepresented if the patient correctly recalled and followed antibiotic instructions from her previous abortion, independent of our quality improvement efforts.

Discussion

Whereas clinical research can teach us how to provide better care, quality improvement research tells us if we are able to successfully implement that care. We found that using a standard preoperative template and a pharmacy located within the same building as the outpatient clinic improves the use of prophylactic antibiotics for patients undergoing abortions in an operating room setting. These interventions significantly improved patient adherence to a prescribed antibiotic, reduced the overall proportion of patients who received no antibiotics, and increased EMR documentation of patient use of a prophylactic antibiotic.

Demonstrating the effect of our quality improvement initiative comes at a crucial time. The Institute of Medicine has made improving patient safety a priority, promoting policies and best practices to create safe and high-quality healthcare environments (Aspden et al., 2004). Accurate assessment of metrics is essential when evaluating the impact of quality improvement efforts. By reviewing preoperative clinic visit records rather than billing codes, we likely captured most, if not all, patients who had a surgical abortion at our institution. Another strength of our study is that our initial period of analysis included the beginning of abortion services at our institution. Therefore, our findings in this quality improvement effort shed light on how academic institutions may continue to improve new services.

Implications for Practice

Checklists and standard templates improve patient care, including adherence to evidence-based practices and better patient safety (Hales et al., 2008). Our interventions are low cost and offer a simple yet practical way to improve quality of care for patients seeking abortion services and other outpatient surgical procedures. This study adds to the existing evidence that physicians using standard documentation can improve patient outcomes (Menachemi and Collum, 2011). In a setting where prophylactic antibiotic provision is an important patient safety measure, using an easily accessible pharmacy to ensure adequate antibiotic provisions and having a standard template can significantly improve the quality and safety of patient care.

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The authors declare no conflicts of interest.

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