An Analysis of Patient Safety Events Submitted by Abortion Facilities in Pennsylvania 2017–2019

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Induced abortion, also called elective abortion, therapeutic abortion, and termination of pregnancy, is widely considered a safe procedure, but complications are known to occur. In Pennsylvania, an induced abortion may be performed at an abortion facility as an outpatient procedure, and these facilities are required to report patient safety events to the Pennsylvania Patient Safety Reporting System (PA-PSRS). We extracted 736 events submitted to PA-PSRS by abortion facilities from 2017 through 2019 and analyzed these events in order to better understand patient safety concerns at abortion facilities in particular. All patients were female, and they ranged in age from 14 to 47 years, with a median patient age of 27 years (interquartile range = 23 to 31 years). Complications related to an induced abortion comprised the majority of events (71.6%; n=527), followed by unplanned transfers to the emergency department or acute visits to a healthcare facility following an induced abortion (13.9%; n=102). The most common complication associated with induced abortion was an incomplete abortion (i.e., retained pregnancy tissue; n=343); other complications included failed abortions (i.e., a continuing intrauterine pregnancy following an abortion; n=101), infections (e.g., endometritis and pelvic inflammatory disease [PID]; n=45), and surgical complications (e.g., hematometra, uterine perforation, and cervical lacerations; n=66). The remainder of events (14.5%; n=107) described other patient safety events that occurred at abortion facilities, such as documentation failures and medication-related events.

Keywords: *abortion complication, incomplete abortion, failed abortion, hematometra, endometritis, uterine perforation, patient safety*

Introduction

Induced abortion, also called elective abortion, therapeutic abortion, and termination of pregnancy, is the removal of pregnancy tissue (i.e., an embryo or fetus) from the uterus.[1] Induced abortion is accomplished through the use of medication (termed medical abortion or medication abortion) or surgical techniques (termed surgical abortion), or some combination of the two.[1] Medical abortions are offered up to 10 weeks estimated gestational age (EGA); surgical abortions are more common for abortions at nine weeks EGA and beyond.[1] In the United States, the most common medication regimen utilized for medical abortion is a combination of mifepristone 200 mg followed 24 to 48 hours later by misoprostol 800 mcg (typically administered vaginally or buccally).[2,3] The most common surgical abortion procedures are vacuum aspiration, dilation and curettage (D&C), and dilation and evacuation (D&E).[1]

Although induced abortion is widely considered a safe procedure, complications are known to occur.[4,5] Many patients having a medical abortion will experience pain and bleeding during or after the process as the pregnancy passes; pain is also common for patients undergoing surgical abortion.[4] The most common complication associated with induced abortion is an incomplete abortion; other complications include failed abortion, infections (e.g., endometritis and pelvic inflammatory disease [PID]), and surgical complications (e.g., hematometra, uterine perforation, and cervical lacerations).[4] Medications, procedures, and potential complications related to induced abortion are detailed in **Table 1.**[1-14]

In Pennsylvania, abortions may be performed at licensed abortion facilities, and any abortion facility that performs more than 100 abortions per calendar year is required to report patient safety events to the Pennsylvania Patient Safety Reporting System (PA-PSRS)*.[15] The Pennsylvania Department of Health (PA DOH) has been monitoring and reporting data related to abortions since 1975, but the patient safety reports submitted to PA-PSRS are typically more detailed than the information included in the annual reports published yearly by the PA DOH and may therefore provide greater insight into abortion complications and other patient safety events that occur at abortion facilities. For this reason, we performed an analysis of all patient safety events submitted to PA-PSRS by abortion facilities over a three-year period to better understand associated patient safety concerns that arise at abortion facilities.

Methods

We extracted all event reports submitted to PA-PSRS by abortion facilities from January 1, 2017, through December 31, 2019. All event reports extracted were included in this analysis.

A descriptive analysis was performed to evaluate trends among information specified by the reporting facility, including patient age, event classification and harm score, and event type and subtype(s). An in-depth qualitative analysis of free-text fields (i.e., event detail, event comments, event recommendation, and event type sub other†) was performed to collect pertinent information (if specified) that would allow better characterization of patient safety events. For event reports that included details about an abortion complication, the following information was coded (if specified):

- Abortion type (i.e., medical or surgical)
- Estimated gestational age (EGA)
- Abortion complication(s)
- Treatment modalities, including medications, used to manage abortion complication(s)

Relationships between key variables, such as abortion complication, abortion type, and treatment modalities, were also explored.

*PA-PSRS is a secure, web-based system through which Pennsylvania hospitals, ambulatory surgical facilities, abortion facilities, and birthing centers submit reports of patient safety–related incidents and serious events in accordance with mandatory reporting laws outlined in the Medical Care Availability and Reduction of Error (MCARE) Act (Act 13 of 2002).[15] All reports submitted through PA-PSRS are confidential and no information about individual facilities or providers is made public.

†The field "event type sub other" provides a space for facilities to add details for events that are classified as other.

Table 1a: Induced Abortion: Medications and Procedures[1-3,5,6,9,10]

Most Common Medications Used for Medical Abortion[1-3, 5, 6]	
mifepristone (Mifeprex) **(previously known as RU-486)**	• ***Dosage form:*** tablet • ***Route of administration:*** oral • ***Mechanism of action:*** counters the effects of progesterone, a hormone that is necessary to sustain pregnancy • ***Common adverse effects:*** nausea, vomiting, vaginal bleeding (may be serious), and pelvic pain • ***Other:*** most effective when used in combination with another medication, such as misoprostol
misoprostol (Cytotec)	• ***Dosage form:*** tablet • ***Route of administration:*** oral, **buccal**, sublingual, **vaginal**, or rectal (bold indicates most effective route) • ***Mechanism of action:*** causes uterine contractions and cervical dilation • ***Common adverse effects:*** bleeding, cramping, diarrhea, nausea, and vomiting • ***Other:*** typically used in combination with mifepristone for a medical abortion; may be used to dilate the cervix prior to a surgical abortion
methotrexate (Trexall)	• ***Dosage form:*** tablet, powder for injection • ***Route of administration:*** oral, intramuscular injection • ***Mechanism of action:*** blocks the production of reduced folate, which is necessary for cell reproduction and DNA synthesis • ***Common adverse effects:*** diarrhea, nausea, and vomiting • ***Other:*** typically reserved for women who are allergic to mifepristone or when mifepristone is unavailable; should not be used beyond seven weeks EGA; also used to treat ectopic pregnancy
Most Common Procedures for Surgical Abortion[1, 5, 9, 10]	
vacuum aspiration	• ***Duration:*** about 15 minutes • ***Procedure:*** cervix is dilated; a small, flexible tube is inserted into the uterus through the cervix; a suction device, either handheld (manual vacuum aspiration [MVA]) or electric (electric vacuum aspiration [EVA]), is used to suction out pregnancy tissue • ***Typical uses:*** pregnancy termination; removal of retained pregnancy or pregnancy tissue after a failed or incomplete abortion
dilation and curettage (D&C)	• ***Duration:*** 5–15 minutes • ***Procedure:*** cervix is dilated; sharp instruments known as curettes are used to remove the pregnancy tissue; often used in combination with suctioning (MVA or EVA) to ensure the procedure is complete • ***Typical uses:*** pregnancy termination; removal of a retained pregnancy or pregnancy tissue after a failed or incomplete abortion
dilation and evacuation (D&E)	• ***Duration:*** procedure itself takes 10–25 minutes, but cervical dilation requires advance preparation over one to three days • ***Procedure:*** cervix is dilated (with medication, mechanical dilators, or osmotic dilators) in advance of the surgery; suctioning is used along with larger instruments (e.g., forceps) to ensure all the pregnancy tissue is removed • ***Typical uses:*** pregnancy termination between 14 and 26 weeks EGA; removal of a retained pregnancy or pregnancy tissue after a failed or incomplete abortion

Table 1b: Induced Abortion: Complications[1,4,7,8,11-14]

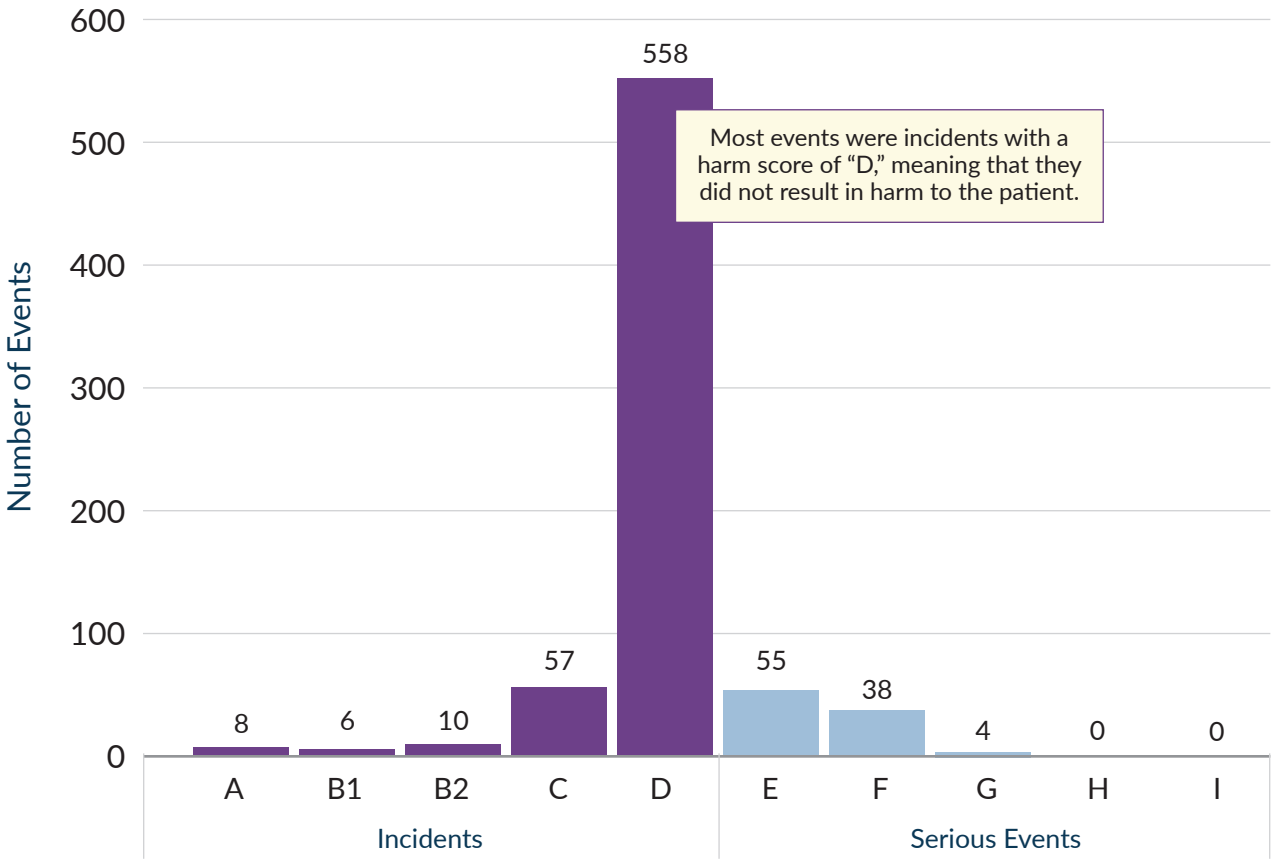
Potential Complications of Induced Abortion[1, 4, 7, 8, 11-14]		
Retained pregnancy or pregnancy tissue	failed abortion	• Complication that results when an induced abortion fails to terminate the pregnancy and an ongoing pregnancy is identified in the uterus • More common with early EGA • When misoprostol was administered as part of the procedure, the primary safety concern is the possibility of birth defects
	incomplete abortion	• Pregnancy tissue remaining in the uterus following an induced abortion • May also be termed retained pregnancy tissue, retained products of conception (RPOC), or intrauterine debris
Infection	endometritis	• Inflammation and infection of the endometrium (i.e., the uterine lining) that results from introduction of bacteria into the uterus • First and most common symptom is fever; other symptoms include abdominal and/or pelvic pain and vaginal bleeding or discharge
	pelvic inflammatory disease (PID)	• A clinical syndrome that encompasses inflammation and infection of the organs of female upper genital tract, including the uterine lining (endometritis), the connective tissue surrounding the uterus (parametritis), the ovaries (oophoritis), the fallopian tubes (salpingitis), and the surrounding peritoneal space (peritonitis) • Symptoms are similar to endometritis but may be more diffuse
Surgical complications	hematometra	• Blood retained within the uterine cavity in the postoperative period
	uterine perforation	• Tear or cut in the uterus that may result from a surgical abortion
	cervical laceration	• Tear or cut in the cervix that may result from a surgical abortion
	broad ligament hematoma	• Hematoma (a collection of blood) that forms in the broad ligament, which is a peritoneal fold that attaches the uterus, fallopian tubes, and ovaries to the pelvis • Typically results from a tear or laceration of the cervix, uterus, or vagina
	ovarian vein thrombosis	• Thrombosis (clot) that forms in an ovarian vein (typically on the right) and obstructs blood flow • Radiographic imaging is necessary for diagnosis
	uterine rupture	• Catastrophic tear of the uterus into the abdominal cavity occurs • Tear often originates along a cesarean scar
	vaginal laceration	• Tear or cut in the vagina that may result from a surgical abortion
	vasovagal reaction	• A type of reflex syncope that results from a failure of blood pressure autoregulation • In the setting of surgical abortion, this may be caused by the use of osmotic dilators for cervical dilation

Results

Descriptive Analysis

We analyzed 736 events submitted by abortion facilities in Pennsylvania from January 1, 2017, through December 31, 2019. Most events were classified by the reporting facility as a complication of a procedure, treatment, or test (84.2%; 620 of 736); within this category, events were most often specified as "other complication following surgery or invasive procedure" (59.3%; 344 of 620) or simply as "other" (36.1%; 224 of 620). Event classification (incident[‡] versus serious event[§]) and harm score for all events are detailed in **Figure 1**; the vast majority of events were classified as incidents (86.8%; 639 of 736) with an assigned harm score of D[¶](75.8%; 558 of 736), which indicates that the patient did not sustain harm as a result of the event. No events resulted in patient death. All patients were female, and they ranged in age from 14 to

Figure 1: Event Classification and Harm Scores, Assigned by Facilities, N=736



Harm Scores[15]

A – Circumstances that could cause adverse events (e.g., look-alike medications, confusing equipment, etc.)
B1 – An event occurred but it did not reach the individual ("near miss" or "close call") because of chance alone
B2 – An event occurred but it did not reach the individual ("near miss" or "close call") because of active recovery efforts by caregivers
C – An event occurred that reached the individual but did not cause harm and did not require increased monitoring (an error of omission such as a missed medication dose that does reach the individual)
D – An event occurred that required monitoring to confirm that it resulted in no harm and/or required intervention to prevent harm
E – An event occurred that contributed to or resulted in temporary harm and required treatment or intervention
F – An event occurred that contributed to or resulted in temporary harm and required initial or prolonged hospitalization
G – An event occurred that contributed to or resulted in permanent harm
H – An event occurred that resulted in a near-death event (e.g., required ICU care or other intervention necessary to sustain life)
I – An event occurred that contributed to or resulted in death

[‡]An "incident" is defined as an event, occurrence, or situation involving the clinical care of a patient in a medical facility which could have injured the patient but did not either cause an unanticipated injury or require the delivery of additional healthcare services to the patient.[15]

[§]A "serious event" is defined as an event, occurrence, or situation involving the clinical care of a patient in a medical facility that results in death or compromises patient safety and results in an unanticipated injury requiring the delivery of additional healthcare services to the patient.[15]

[¶]A harm score of "D" indicates that an event occurred that required monitoring to confirm that it resulted in no harm and/or required intervention to prevent harm.

47 years, with a median patient age of 27 years (interquartile range=23 to 31 years).

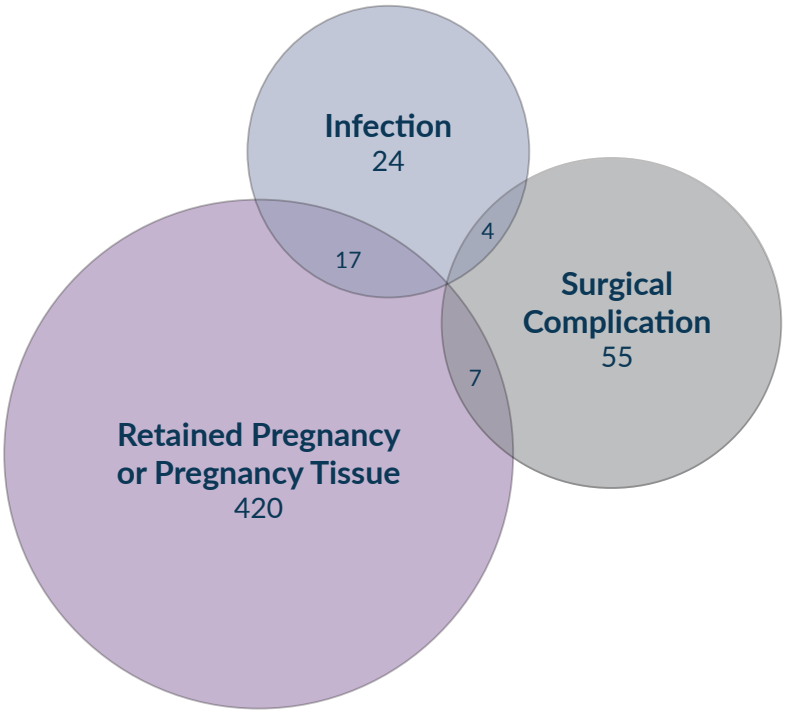
All events except 1 were in some way related to an induced abortion (either stated directly or implied); the 1 remaining event described an expelled contraceptive implant. About three-quarters (71.7%; 527 of 736) of events described a patient who experienced one or more complications related to an abortion, and 102 events (13.9%) described a patient who had an immediate unplanned transfer to the emergency department (ED) following an induced abortion, or later unplanned acute visit to the abortion facility or an ED following an induced abortion. The remaining 106 events (14.4%) were unrelated to an abortion complication and described procedural or administrative issues surrounding an induced abortion performed at the abortion facility, such as documentation failures or medication-related events.

In-Depth Qualitative Analysis of Abortion Complications

Among 527 events that described at least one abortion complication, patients more often had undergone a medical abortion (69.1%; n=364) than a surgical abortion (30.4%; n=160); 3 events did not specify the type of abortion. EGA was specified for 380 of these events and ranged from 4 to 23 weeks.

Events were categorized into three groups of abortion complications: retained pregnancy or pregnancy tissue (84.3%; 444 of 527), surgical complications (12.5%; 66 of 527), and infections (8.5%; 45 of 527). Complication groups were not mutually exclusive, and 28 patients experienced complications in two of the three groups, e.g., a surgical complication and an infection (see **Figure 2**). Abortion complications categorized by complication type and year are summarized in **Table 2.**

Figure 2: Abortion Complications, Categories Assigned by Analyst, N=527



Retained Pregnancy or Pregnancy Tissue

Among 444 events involving a retained pregnancy or pregnancy tissue, incomplete abortions (77.3%; n=343) were far more common than failed abortions (22.7%; n=101). Overall, among 426 events that specified one or more treatments for a failed or incomplete abortion, the most common treatment was a D&C; treatments for failed and incomplete abortions grouped by abortion type are detailed in **Table 3.**

Among 350 events in which a patient was diagnosed with a failed or incomplete medical abortion, the patient received an additional dose of misoprostol as second-line treatment in 94 events (26.9%). In nearly one-third (33.0%; 31 of 94) of those events the patient required third-line treatment, and the most common third-line treatment was a D&C (87%; 27 of 31).

Table 2: Abortion Complications by Year of Occurrence, N=527

Year	Retained Pregnancy or Pregnancy Tissue		Infection		Surgical Complication			*Total*
	Failed Abortion	Incomplete Abortion	Endometritis or PID	Other	Hematometra	Uterine Perforation	Other	
2017	32	83	13	4	14	9	5	***160***
2018	36	100	7	6	5	6	9	***169***
2019	33	160	10	5	7	8	3	***226***

Note: PID indicates pelvic inflammatory disease.

Table 3: Treatments for Incomplete and Failed Abortions by Abortion Type, N=426

	Surgical Abortion		Medical Abortion	
	Failed Abortion	*Incomplete Abortion*	*Failed Abortion*	*Incomplete Abortion*
Dilation and Curettage	1	41	52	111
Misoprostol	1	19	5	89
Aspiration	1	11	5	21
Expectant Management	0	4	0	18
Dilation and Evacuation	2	6	9	13
Unspecified Surgical Procedure	3	0	12	0
Other	1	6	1	1

Note: "Other" includes sutures, hysterectomy, salpingectomy, and laparoscopy.

Infections

Infections[#] were observed more often following a medical abortion (55.6%; 25 of 45) than a surgical abortion (42.2%; 19 of 45); the abortion type was not specified in 1 event that involved an infectious complication. The most common infections were endometritis/PID[**] (66.7%; 30 of 45) and urinary tract infections (15.6%; 7 of 45); other infectious complications included sepsis and group B streptococcal infection. Endometritis/PID occurred with roughly the same frequency following a medical abortion (53.3%; 16 of 30) or a surgical abortion (46.7%; 14 of 30).

Among 45 events involving an infectious complication, 42 events (93.3%) specified that the patient received antibiotic therapy, and 13 events indicated that the patient received a combination of antibiotics. Among 16 patients diagnosed with endometritis/PID for whom the prescribed antibiotic(s) were specified, a combination of ceftriaxone, doxycycline, and metronidazole was prescribed most often (n=5). For the 1 event in which a patient was diagnosed with sepsis, the patient had undergone a medical abortion, and she received a combination of ceftriaxone, doxycycline, and vancomycin to treat the infection.

Surgical Complications

The most common surgical complications following a surgical abortion were hematometra (n=26), uterine perforation (n=23), cervical lacerations (n=7), and uterine atony (n=4); other surgical complications included a serious vasovagal reaction, vaginal perforation, ovarian vein thrombosis, broad ligament hematoma, and uterine rupture secondary to placenta increta[††]. Among 26 patients who were diagnosed with hematometra, 10 patients were treated with a D&C, and 8 patients were treated with MVA. Among 23 patients who experienced a uterine perforation, 6 patients underwent laparoscopy to confirm and/or repair the perforation, and 3 patients required a hysterectomy.

Other Unplanned Transfer or Acute Visit Following Induced Abortion

Following an abortion procedure, 102 events (13.9%; N=736) involved an unplanned transfer or acute visit; among events that specified the type of abortion procedure, patients had more often undergone a medical abortion (n=64) than a surgical abortion (n=32). Eight patients were immediately transferred to an ED for evaluation of a possible complication (e.g., uterine perforation, elevated blood pressure, or excessive bleeding); these patients were treated and released following confirmation that a complication had not occurred, or the details of their visit were not specified or not known.

An additional 94 patients had an unplanned visit to a healthcare facility (i.e., the abortion facility, an urgent care clinic, or an ED) at some time after their procedure for evaluation of symptoms. Apart from bleeding, which we analyzed across all events (see below, **Other Trends**), the most common presenting symptoms overall were pain or cramping (n=46), dizziness or fainting (n=12), and nausea or vomiting (n=9); other complaints included fever, flu-like symptoms, dehydration, hypertension, shortness of breath, chest pain, and weakness. Among 46 patients that reported pain or cramping, 27 patients received analgesic medications, which included acetaminophen, nonsteroidal anti-inflammatory drugs, and opioids.

Brief Analysis of Other Patient Safety Events Unrelated to an Abortion Complication

The remaining 106 events (14.4%; N=736) that were not related to an abortion complication or an unplanned transfer

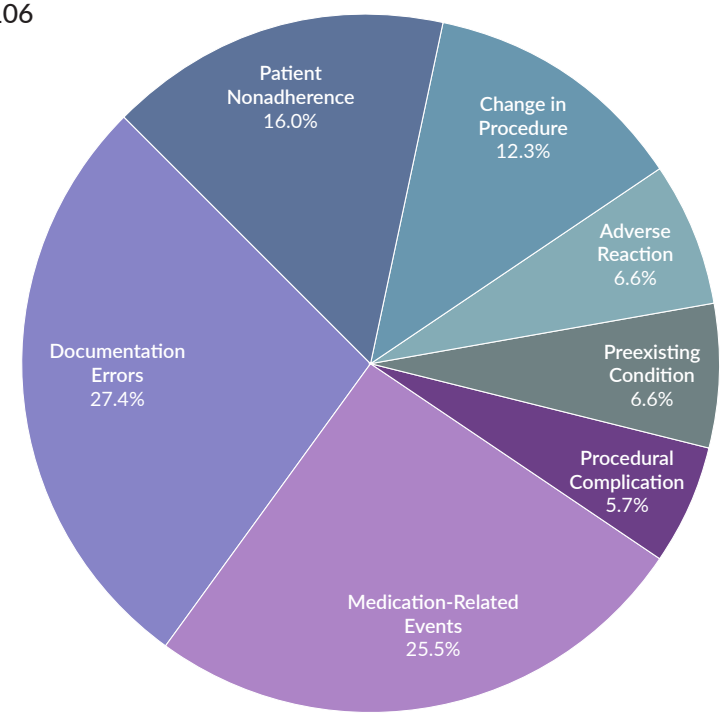
[#]Diagnosis of infection is a complex process that goes beyond the scope of this analysis, as the Patient Safety Authority does not have access to patient-specific clinical data related to event reports. Events were coded as infections if the facility reported them as such.

[**]Endometritis and PID were grouped together because endometritis is a diagnosis that falls under the umbrella of PID, and treatment of the two infections is similar.[8]

[††]Placenta increta is a complication of pregnancy in which placental tissue invades the myometrium.[16]

or acute visit following an induced abortion are summarized in **Figure 3.** Over one-quarter (27.4%; 29 of 106) of events involved documentation errors (e.g., patient or provider did not sign consent or provider did not document procedure or monitoring), and another one-quarter (24.5%; 26 of 106) of events involved medication (e.g., patient left the facility without her prescription, patient was not given RhoGAM[‡‡] as indicated, or patient was dispensed the wrong medication). The other half of events (47.2%; 50 of 106) fell into of one of five groups: (1) patient nonadherence (e.g., patient signed out against medical advice prior to the completion of the observation period or patient used an illicit substance prior to the procedure); (2) change in procedure from surgical abortion to medical abortion or vice versa, often related to an incorrect EGA or complicated patient anatomy; (3) patient experienced an adverse reaction following procedure while still at the facility (e.g., fall or heavy bleeding); (4) patient had a preexisting condition that precluded continuing with the induced abortion or required additional treatment following the procedure (e.g., ectopic pregnancy, tumor, or tortuous blood vessel); or (5) another procedural complication (e.g., problems with dilators for a surgical abortion or lost specimen following a procedure).

Figure 3: Patient Safety Events Unrelated to an Abortion Complication, N=106



Other Trends

There were some trends observed across all reported events. The patient experienced concerns surrounding bleeding following an induced abortion in 221 events (30.0%; N=736). Among these bleeding events, the patient was diagnosed with anemia in 32 events, and the patient received a blood transfusion in 34 events; these were not mutually exclusive. Patient adherence was a concern in 59 events (8.0%; N=736) that specifically indicated the patient was "not compliant" with some aspect of an induced abortion or its follow-up.

Discussion

To our knowledge, our analysis is the first to examine patient safety reports related to induced abortions and complications submitted solely by abortion facilities. In addition, the information available in the reports submitted to PA-PSRS is more detailed than what is available in state or national abortion surveillance reports, and so our analysis is able to provide a unique perspective on the topic of abortion complications.

Recent annual reports of abortion statistics published by the PA DOH indicate that women more frequently undergo surgical abortions than medical abortions, with surgical abortions accounting for roughly 60% of procedures performed in 2017 and 2018.[17,18] However, complications were observed more often following medical abortions in both our analysis and in annual reports of abortion statistics in Pennsylvania, and the most common complication we observed with medical abortion was a failed or incomplete abortion.[17,18] This finding is not surprising given that studies have found that medical abortion fails more often than surgical abortion, with success rates of 94.1% and 97.7%, respectively.[19]

We observed an increase in the number of incomplete abortions reported from 2017 to 2019. At the time of publication of this article, abortion data across the United States is available only through 2016 and within Pennsylvania only through 2018, so we cannot draw any conclusions about the relationship between this observed shift and the number and type of induced abortions performed each year. It should also be noted that overall patient safety event reporting increased across Pennsylvania during this same timeframe, so we cannot determine whether there were more actual events or if the increase is solely due an increase in reporting efforts.

Although the choice of induced abortion is dictated in part by the EGA, patients often do have clear preferences for one procedure type over another that may include considerations other than success rates.[10,20] In a study of women's preferences regarding induced abortion, women who were eligible for either a medical or surgical abortion based on EGA underwent a medical abortion 68% of the time.[20] Medical abortion offers a

[‡‡] Rh^0(D) immune globulin (RhoGAM) is an injection administered after spontaneous or induced abortion to women who are Rh negative to prevent a reaction against fetal blood that is Rh positive.[1]

less invasive option that may be completed in the privacy of the patient's home, and more recently, telemedicine may allow for patients who would otherwise have limited access to induced abortion to safely receive a medical abortion remotely.[21] Alternatively, some women prefer surgical abortion because of the low rate of complications and completion within an expected time frame.[10]

Bleeding is an anticipated complication of any induced abortion[1] and was frequently reported in our study across all events; however, bleeding severe enough to require a blood transfusion was rare. Post-abortion bleeding is generally only considered to be a serious complication when it is heavy for longer than 12 hours or when bleeding persists beyond 21 days.[22] Bleeding as a serious complication may result from uterine atony, uterine perforation, cervical lacerations, incomplete abortion, or an underlying coagulopathy.[13] Absence of bleeding following a medical abortion may be a signal that the procedure has failed and further intervention may be required.[1]

Worldwide, infectious complications are a serious cause of morbidity and mortality following induced abortion, especially in areas where access is limited or induced abortions are illegal.[23] In the United States, infections following induced abortion are rare, and we observed infectious complications in only 8.5% of events involving abortion complications.[23, 24] Retained pregnancy tissue following induced abortion may provide an ideal spot for an infection to germinate, and surgical instruments introduced into the uterus during an induced abortion are believed to increase the risk for an infection.[24]

Information was sparse in the medical literature regarding endometritis following induced abortion, and this is likely due to the rarity of this complication in the United States. In contrast, endometritis is one of the most common postpartum complications following cesarean delivery, occurring in up to a quarter of cases.[24] Endometritis is a clinical diagnosis, and the most common signs of this infection include retained pregnancy tissue, fever, vaginal discharge, and heavy bleeding.[24] Cultures may be obtained to confirm the diagnosis and inform choice of antibiotics, which may be given orally or intravenously depending on disease severity.[7,24] Broad-spectrum antibiotic coverage is desirable because of the diverse pathogens that may cause an infection following an induced abortion, and we observed that nearly one-third of patients diagnosed with endometritis received two or more antibiotics.[23] In addition to antibiotic treatment, retained pregnancy tissue should also be evacuated from the uterus to eliminate the source of the infection.[23]

Surgical complications following induced abortion occur more often and are more severe as EGA increases.[13] Hematometra was the most common surgical complication observed in our study, and although it is associated with severe pain and cramping, prompt diagnosis and treatment typically allow for resolution without further issues.[13] Uterine perforation was the second most common surgical complication observed in our study, and variation in treatment ranged from expectant management to hysterectomy. Uterine perforation in the first trimester tends to be low-risk and may be managed with conservative observation.[13] In contrast, perforation following a D&E may result in more extensive injuries (e.g., bowel injuries) and may require more invasive exploration and intervention (e.g., laparoscopy, laparotomy, or hysterectomy).[13] Notably, uterine perforation is the most common complication of a surgical abortion that necessitates a hysterectomy.[13]

Limitations

Although it may be desirable to assess the safety of induced abortions by calculating rates of abortion complications in the state of Pennsylvania, this is beyond the scope of our study. Although the PA DOH publishes an annual report of abortion statistics, they do not specify where procedures were performed.[17,18] For our study, we only extracted patient safety events submitted to PA-PSRS by abortion facilities, as our objective was to broadly assess patient safety at this specific subset of facilities rather than to focus on the complications associated with induced abortion at all types of facilities. In addition, we may have missed events submitted by hospitals and physician practices as well as events that may have taken place at abortion facilities that provide fewer than 100 abortions per year, and this may also limit the generalizability of our findings to these other clinical settings.

Despite mandatory event-reporting laws in Pennsylvania, our data are subject to the limitations of self-reporting. Because the details included in each event report are left up to the discretion of the reporter, some information was missing or incomplete for some events, such as EGA, abortion type, and infection type. Standard criteria for what constitutes an abortion complication have not been established, and the definitions we found were varied, so we attempted to design a framework for classification based on our available data and the most recent literature, which may also limit comparison of our findings with other studies.

Conclusion

Current data and research regarding induced abortions in the United States have demonstrated their safety. In our study, we observed that the vast majority of patient safety events reported by abortion facilities in Pennsylvania did not result in patient harm, although some patients did require interventions to ensure a successful outcome. Incomplete abortion was the most common complication observed in our study and in the literature, and these were observed more often following medical abortions. The most common infectious complication of an induced abortion was endometritis/PID, which was typically treated with antibiotics. The most common surgical complications were hematometra and uterine perforation/rupture, the latter of which involved more serious and invasive treatments, up to and including hysterectomy. In the future, it may be beneficial to investigate abortion complications prospectively in order to collect specific data that may allow researchers to more definitively connect patient-specific factors, such as patient age and EGA, with specific induced abortions and associated complications.

Notes

This analysis was exempted from review by the Advarra Institutional Review Board.

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