

Physician-Reported Adverse Events and Medical Errors in Obstetrics and Gynecology

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Abstract

Objective: To explore the feasibility of a novel method for capturing adverse and potential adverse events within an urban teaching hospital obstetrics/gynecology (OB/GYN) service. **Methods:** At morning rounds during two 6-week periods, OB/GYN resident physicians were asked to complete incident reporting cards identifying obstacles to care, injuries or extended hospitalizations, and problems affecting their patients. Responses were coded by type of incident, consequences for the patient, responsible party, process-of-care deficiencies, and preventability of the incident. These were coded by a physician panel and compared with retrospective chart analysis and hospital incident review. **Results:** Eighty-two events were reported during the project period, 56 percent in obstetrics and 44 percent in gynecology, including 7 adverse and 38 potential adverse events. Retrospective chart review corroborated 76 percent of the events with only two noted in hospital incident reports. **Conclusion:** A physician-based voluntary reporting system in OB/GYN complements existing methods for identifying medical errors.

Introduction

Although the extent of medical error has been well characterized among general medicine and surgical patients, less is known about errors and adverse events (AEs) in obstetrics and gynecology (OB/GYN).^{1, 2} Previous studies have identified AE and near miss rates at approximately 5 percent of admissions using a variety of methods. However, detection methods are often expensive, labor-intensive, and difficult to maintain.^{3, 4, 5} Incident reports, required by State health departments and accreditation agencies, fail to detect many AEs.⁶ Investigators have explored alternative or complementary approaches for finding AEs, including the use of physician-based voluntary reporting systems.⁷

Resident physicians in teaching hospitals regularly meet to communicate information about patients. They are intimately aware of impediments to care or errors in management. Resident physicians in medicine—through confidential peer interviews with other frontline providers during routine daily work rounds—were able to detect AEs and near misses in up to 5 percent of admissions.⁸ This approach was particularly well suited for identifying near misses. It was not burdensome, with 5-minute interviews and a high yield per interview. It also provided junior physicians with a better understanding of critical faults in the current system, which may motivate them to find remedies.

Obstetrics and gynecology is a branch of medicine affected disproportionately by medical malpractice. Insurance premiums of \$100,000 per year are becoming commonplace nationally. Bad outcomes in OB/GYN frequently lead to multimillion dollar awards. Although serious AEs are infrequently related to medical errors, relatively little is known about errors in OB/GYN practice. This project was undertaken to assess the ability of resident physicians to identify AEs and medical errors and to characterize these reports.

Methods

Setting

We conducted a prospective, observational project in two 6-week blocks between February 2003 and July 2003 as a peer review activity under the auspices of the Quality Improvement Committee within the department of obstetrics and gynecology. The project site was a 556-bed academic medical center in Boston. During the project year, 554 major and 964 minor gynecologic procedures were performed, as well as 4,755 deliveries. Admissions to the obstetric and gynecologic services were 6,932 and 2,641, respectively. Hospital patients were drawn from the Boston area and its surrounding suburbs. Seventy percent of patients had private insurance, 20 percent belonged to an HMO, and 10 percent were on public assistance.

A senior resident physician led morning work rounds. During rounds, the senior resident reviewed patients cared for at the hospital with house staff from the obstetric and gynecologic services. Additionally, a formal teaching session took place Monday through Friday under the supervision of an attending physician. On the obstetric service, a senior nurse (“resource nurse”) participated in the morning rounds and coordinated all activity on the labor floor during a shift. Nurses on the labor and delivery unit typically functioned with a great deal of autonomy and consulted with supervising physicians when appropriate. Nurses on the unit reported problems they encountered during their shift to the resource nurse.

Interview Protocol

During the 12-week project period, one investigator attended obstetric and gynecologic morning rounds on average three times per week. The investigator asked house officers to complete incident reporting cards to respond to a series of questions:

1. Did you encounter any obstacles to delivering high-quality care?
2. Were any patients injured or hospitalizations extended as a result of our care?
3. If so, what happened? Why? Who were the responsible parties? Were there any consequences for the patient?

House officers were encouraged to fill out cards immediately after reportable events occurred and to place them in collection boxes located prominently on the units. Additionally, cards were collected at the morning rounds, at which time house officers were prompted to submit reports.

Coding and Classifying Errors

Cards were collected in an ongoing manner during the project period, and the information was entered into a spreadsheet. Two obstetricians reviewed each event narrative with a classification scheme developed by one of the investigators for a previous study.⁹ A third physician resolved discrepancies. Responses were coded by the type of incident, consequences for the patient, responsible party, process-of-care deficiencies, severity, and the preventability of the incident. Coders identified the responsible party for the incident from a list of 11 possibilities; the most important process-of-care deficiency from a list of 21 options; and the most serious adverse outcome the patient experienced from a list of five possibilities. The following definitions were used to code the type of event:

- Adverse events were injuries that occurred as a result medical care, rather than the natural course of the illness.
- Potential adverse events were errors where injuries could have occurred but did not, either due to good fortune or corrective action.
- Quality problems that did not meet the definition of AE or near miss were classified separately and typically reflected inefficiencies, inconveniences, or defects in service quality. For example, quality problems (other than AEs and potential AEs) occurred when appropriate instruments were not available for an emergent procedure, or routine lab results did not return in a timely manner.
- Finally, coders judged the preventability of each AE as probably, possibly, or unlikely.

Corroboration of Reports

Events were reviewed independently and compared with retrospective chart reviews and hospital incident reports. The risk management department of the hospital, in accordance with State and Joint Commission requirements, maintains a hospital electronic incident reporting system.

Statistics

We used the kappa statistic to calculate inter-rater reliability among coders, which was substantial. We calculated the rates of AEs, potential AEs, and other quality problems using admissions as a denominator. We used Stata[®] software, version 6.0 (STATA Corp., College Station, TX) for statistical calculations.

Results

Overview

The project was conducted in two 6-week blocks between February 2003 and July 2003. Eighty-two events were reported: 46 in obstetrics and 36 in gynecology. Nine patients experienced two or more incidents.

Demographics

The majority of incidents affected patients over age 40 for gynecologic service and age 31 to 40 for obstetric service. Patients were mostly white, enrolled with a commercial HMO, did not require an interpreter, and saw a hospital-based provider (Table 1).

Adverse Events and Potential Adverse Events

Overall, potential AEs were most commonly identified. The majority of AEs were judged to have significant consequences but a high degree of preventability (Tables 2 and 3). Events characterized as “none of the above” usually involved administrative issues with no clinical consequences (e.g., planned surgery performed later than scheduled). A few events are detailed in the Appendix.

Seven events (9 percent) resulted in patient harm (AEs), while most involved a potential AE (46 percent) or other quality problems (32 percent). The most frequently reported events involved either a delayed diagnosis (39 percent) or delayed treatment (31 percent). The following adverse events were reported:

- Excess administration of intravenous narcotics postoperatively, requiring an ICU admission for monitoring.
- Need for general anesthesia when a scrub technician suffered a syncopal episode during a cesarean delivery, and the regional anesthetic wore off due to a delay in getting a replacement.
- Excessive blood loss, resulting in marked anemia due to a delayed start of an emergent surgical case. An additional operating room team had to be called in, due to high acuity during off hours at the hospital; an attending physician could not be identified for a resident clinic patient; once identified, the attending physician could not enter the changing room.
- Failure to monitor an insulin pump or involve the endocrine staff with management of a diabetic patient. The result was a significant hypoglycemic episode during labor, which required a cesarean delivery, due to a non-reassuring fetal heart rate pattern, and the baby requiring NICU support for glucose control.

Table 1. Patient characteristics

Demographics	N	%
Age (yrs)		
<20	1	2
21-30	16	27
31-40	28	47
>40	15	25
Race		
White	36	60
Asian	10	17
African American	10	17
Hispanic	4	7
Insurance		
Commercial indemnity	21	35
Commercial HMO	25	42
Medicare	4	7
Medicaid	6	10
Uninsured	4	7
Practice group		
Private	7	12
Hospital based	30	50
Community health center	6	10
HMO	8	13
Resident clinic	9	15

vents and preventability	N	%
Adverse events	7	9
Definitely preventable	4	
Probably preventable	3	
Potential adverse event	38	46
Definitely preventable	28	
Probably preventable	9	
Error without injury	26	32
Definitely preventable	32	
Probably preventable	6	
None of the above	11	13
Total	82	100

Injury and severity	N	%
Adverse events	7	9
Life Threatening	1	
Serious	5	
Significant	1	
Minimal/none	0	
Potential adverse events	38	46
Life Threatening	1	
Serious	8	
Significant	29	
Minimal/none	0	
Error without significant injury	26	32
None of the above	11	13
Total	82	100

- Need for a blood transfusion because of excessive blood loss due to poor communication between the radiology, emergency room, and gynecology services, as well as difficulty identifying the attending physician, resulting in the delayed diagnosis and treatment of an abnormal pregnancy. Numerous potential AEs involved lab work delays related to orders not entered, orders not acknowledged by a nurse, phlebotomy staff drawing blood, transport staff bringing the specimen to the lab, and the lab processing the sample or reporting the results.

Other near misses were more straightforward, such as incorrect gloves used with a patient allergic to latex and inadequate supplies to perform a procedure easily.

Responsible Parties

Laboratory staff and support personnel, such as transportation or supply services, were involved in 21 (23 percent) and 15 (16 percent) events, respectively (Table 4). Nurses were involved in 20 events (22 percent), house officers in 11 (12 percent), and attending physicians in 11 (12 percent).

Problematic Processes

A total of 103 problematic processes were identified overall, with 18 cases having more than one process listed (Table 5). The predominant process-of-care issue was related to clinical services in 27/103 cases (26 percent), with failure or a delay in performing tests for the predominant

Table 4. Types of responsible parties

Responsible party	N	%
Laboratory	21	23
Nurse	20	22
Support services	15	16
House officer	11	12
Attending physician	7	8
Emergency services	3	3
Scrub technician	2	2
Other	13	14
Total	92	100

Table 5. Types of process-of-care issues

Process-of-care issues	N	%
Clinical services	27	26
Support services	17	17
Therapy		
Medication-related	14	14
Procedure-related	11	11
Diagnosis	11	11
Other		
Poor communication	11	11
Miscellaneous	9	9
Prevention	3	3
Total	103	100

problem (21/27 cases); 25 cases involved process issues with therapy, 14 cases (14 percent) related to medications and 11 (11 percent) to procedures.

Support services were implicated in 17 cases (17 percent), with inadequate supplies being the most common issue (15/17 cases). Eleven cases (11 percent) involved process issues in making a Diagnosis, and the same number (11 cases) were related to poor communication.

Corroboration of Reports

Seventy-six percent of house officer-reported events were corroborated by retrospective chart review. During this same period, staff submitted 43 hospital incident reports in obstetrics and 16 in gynecology. Only two events were captured by both house officer reports and the usual hospital incident reporting system.

Discussion

Our project describes the types, severity, and preventability of errors detected by house officer voluntary reports on an active OB/GYN service at an academic medical center. In this pilot project, we elicited 82 incident reports from resident physicians during weekday rounds. These included seven AEs (9 percent) ranging from inappropriate medication administration to excessive blood loss from delayed procedures, in some cases requiring a blood transfusion. Potential AEs accounted for the largest percentage of incidents (46 percent), a class of incidents that may offer important lessons about the system's vulnerability to harm. Since near misses do not result in injuries and are, therefore, unlikely to carry medical liability, physicians may be more comfortable in reporting such events. In addition, these potential AEs may represent a more relevant way of detecting errors, since they were derived from direct clinical experiences, where residents felt change should occur.¹⁰

At least one incident report was noted in 73 of the 2,203 admissions during the study period, yielding a rate of 3.3 percent of admissions complicated by a medical error. Using this method, 0.3 percent of admissions were complicated by an AE and 1.7 percent by a potential AE. These findings are somewhat lower but consistent with other studies of AEs, which found that 2.9 to 13 percent of patients admitted to acute care hospitals suffer an injury due to medical treatment that leads to increased length of stay or disability, and that 5 to 10 percent experience a serious medication error.^{5, 11} Consistent with other studies, we found that most errors reported by OB/GYN residents were near-miss errors that (fortunately) did not result in an AE.

The difference in AE rates may be due to the nature of patients admitted to an OB/GYN service. In this study, the majority of admissions were in obstetrics, known for its uniqueness within a hospital population.² Typically, such patients are younger and healthier than those on the average medical or surgical service. Patients are admitted for shorter periods, and the admission is highly structured. Finally, patients in obstetrics spend the majority of time during their admission with a nurse. Physicians tend to get involved primarily for deliveries and when the natural process of labor and delivery goes awry. Since physicians are doing the reporting, this would mean less opportunity for them to notice an error and a tendency to focus more on surgical complications, which are uncommon in obstetrics.

Another distinction noted is that most of the medical errors detected by resident physician reports were not identified by the existing hospital incident reporting system. Other studies have found that hospital incident reporting systems have limited detection rates, and that physician-based reporting may complement this method in the identification of errors.^{6, 9, 12} Although 76 percent of physician-reported events were verified by retrospective chart review, only two of these events were reported through the hospital incident reporting system. Additionally the types of problems encountered, specifically in obstetrics, are often different from the mainstream hospital population and not amenable to traditional methods of detection.^{2, 13} They rarely result in AEs and tend to be more system-based issues, dealing with communication and coordination difficulties that require a detection method not based solely on chart reviews.¹⁴ These differences also may challenge the typical methods of remediation exercised by hospital management.¹⁵

The engagement of physicians in generating reports may account in part for differences in the types of events captured and recorded in each system.¹² The nursing staff enters most incident reports into a computerized system in our existing hospital system, and these primarily relate to falls, medications, and operating room logistics. Residents and attending physicians may not view the use of this system as a key part of their professional responsibilities. The value of educating physicians, house staff, and medical students about patient safety cannot be overstated.^{16, 17} We actively elicited resident physicians' participation by integrating incident reporting into teaching rounds and by presenting this process as a peer review activity. A recent study indicated significant variations of incident reporting amongst the different medical specialties that corresponded with the attitudes and participation of medical staff.¹⁸ Similar to our project, they found physicians were more likely to participate when the method of reporting was integrated within medical, rather than managerial, systems of quality improvement.

We are well aware of the limitations of this study, since hospital incident reports highlighted several errors that escaped detection from our system. First, although residents were welcome to

submit incident reports at any time, these reports were actively solicited only during or after weekday morning rounds. As the total denominator of clinical activities is not known, it is difficult to estimate whether weekend, daytime, or nighttime events might have been under-reported. This also limited the insights into the number of events identified on the obstetric and gynecologic services, although this number roughly corresponded to relative patient volume.

Second, the level of clinical responsibilities and the corresponding available time to devote to error reporting might have played a factor in whether events were reported. A busier clinical service, with a high number of admissions, might preclude residents from having time to report incidents, or alternatively, might have generated a greater number of reports, since more potential events could have occurred. Unfortunately, our data do not allow us to analyze the effect of the number of admissions on the number of incident reports. Finally, the level of individual enthusiasm and motivation to participate in the process will affect the number of incident reports generated.

Future use of this system relies on two major factors. First, time must be allocated during the daily work rounds for this system to continue. Although only a few minutes per day are involved, this time has significant value for busy clinicians, even if it is incorporated into the standard workflow process. Second, those who report incidents must feel their time has been well spent, so it is vital they know the issues they identify are addressed.

Identifying and correcting errors will lead to financial benefits by improving the quality and efficiency of operations, as well as the job satisfaction of those involved, as others have noted.¹⁰ Additionally, outcomes can be measured to assess the overall cost-benefit of this system. In our study, in addition to informal sharing of the events during regular meetings with administrators, we gave formal reports to the departmental Quality Improvement Committee, where incidents were aggregated, analyzed for trends, and examined for root causes that could be remedied. A future opportunity for consideration is for a resident physician on rotation to also serve as a committee member, thereby providing a two-way channel of communication.

Conclusion

This project demonstrates the feasibility of resident physician incident reporting in obstetrics and gynecology, despite the characteristics that make it different from other hospital services. This system was simple to organize and administer and inexpensive, and it complemented the existing incident reporting system. One of the most positive aspects of this system is the involvement of house officers, who are intimately involved in the care of patients and can lead to a new generation that incorporates quality improvement into their daily work. In order for a voluntary system to sustain itself, there must be a cycle of positive feedback developed by addressing these reported barriers to providing good care.

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Appendix

Sample Narratives and Classification

Event 1. Cesarean hysterectomy performed emergently on patient with *placenta accreta*. Scrub technician and circulating nurse inadequately prepared for procedure, and appropriate instruments were not readily accessible.

Process problem: Procedural delay, loss of sterile technique.

Adverse consequence: Delayed treatment.

Responsible parties: Nursing, scrub technician.

Preventable: Yes.

Event 2. A patient who did not speak English arrived at the hospital in active labor but found entrance locked and no personnel available. Patient and her partner returned to their car and drove to the ER, which then sent them via ambulance to Labor and Delivery. An inadequate evaluation was performed in the ER prior to transfer, and the patient arrived fully dilated and delivered within minutes of arrival.

Process problem: Procedural delay, inadequate evaluation.

Adverse consequence: Delayed evaluation and treatment.

Responsible parties: Parking personnel, ER staff.

Preventable: Yes.

Event 3. Patient identified with an ectopic pregnancy; methotrexate ordered for medical management. After 5 hours, house staff discovered medication had not been administered because nursing staff were awaiting specialized gloves (which were not readily available on the floor) to deliver medicine.

Process problem: Insufficient supplies, inadequate communication.

Adverse consequence: Delayed treatment.

Responsible parties: Support services, nursing.

Preventable: Yes