The Usefulness Of A Preoperative Pregnancy Questionnaire In Determining The Need For Pregnancy Testing Prior To Anesthesia

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Abstract

Background: Many physicians require pregnancy testing before anesthesia despite no evidence that anesthetics in clinical concentrations are teratogenic. This approach is costly and does not follow current recommendations. The authors designed a preoperative pregnancy questionnaire to determine the likelihood of pregnancy. The goal was to determine if an assessment based on history would help decrease needless preoperative tests.

Methods: Patients (n=216) 13-56 yrs completed the questionnaire and underwent urine pregnancy testing prior to surgery. The questionnaires were reviewed to determine if pregnancy testing was indicated.

Results: Twenty-one patients needed pregnancy testing based on their histories. The testing yielded one positive result that was predicted based on history.

Conclusions: A questionnaire is useful for the anesthesiologist when determining the need for preoperative pregnancy testing. A history is the backbone of medicine, and should guide preoperative testing. This would streamline the preoperative process, while maintaining vigilance.

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INTRODUCTION

Preoperative pregnancy testing has been a controversial subject in anesthesiology for years. Some anesthesia departments mandate preoperative pregnancy testing on all patients of reproductive age before surgery. Others rely on the preoperative assessment for determining the need for pregnancy tests.

It is currently the policy at our institution that all patients of reproductive age undergo preoperative pregnancy testing. This approach is based on concerns about potential teratogenicity of anesthetics as well as the potential for harm to the fetus from surgery itself. This fear has persisted despite the fact that there is no scientific evidence to indicate that anesthetics used in clinical concentrations lead to an increased incidence of spontaneous abortions or congenital malformations. In fact, a study in Sweden with 5,405 patients showed no increased incidence of anomalies or stillbirths among infants exposed in utero to surgery and anesthesia. Given this information, it is understandable that the recommendation of a leading text in anesthesia and an expert in preoperative testing is to base pregnancy testing on the patient's history.[1]

We proposed that a history obtained from a questionnaire would be useful in determining which patients need preoperative pregnancy testing. Using the history to guide preoperative testing would be cost effective, decrease surgical delays and would follow current recommendations.[2] This questionnaire would give physicians a consistent history by which to base medical decisions. A review of the anesthesia literature over the last three decades yielded no study where a questionnaire was used to assess the need for preoperative pregnancy testing.

MATERIALS AND METHODS

The institutional review board at Brooke Army Medical Center approved this study. The questionnaire used in this study is included in this manuscript (Table I). The patient population included active duty personnel, spouses and dependents of active duty personnel, and retirees and their spouses. Patients (n=216) who were scheduled for elective surgery completed the questionnaire prior to their surgeries. As is the policy at our institution, all of the patients in the study underwent preoperative urine pregnancy testing (Abbott Testpack Plus hCG-Combo Assay). The sensitivity of this test is 99.4% and the specificity is 99.8%. The questionnaires were reviewed independently by two anesthesiologists and the reviewers noted whether or not testing was indicated. Then all of the lab results were reviewed and compared to the physicians' assessments. The questionnaires and the answers were all kept strictly confidential.

Figure 1

Table I: Preoperative Pregnancy Screening

1. Are you currently pregnant? Yes No
2. Is there any chance that you could be pregnant? Yes No
3. What was the first date of your last menstrual period?
4. Are you sexually active? Yes No
5. Do you use a form of contraception? Yes No

If yes, please circle the form or forms of contraceptives you or your partner use

a. Natural Family Planning (Rhythm method)
b. Barrier method (condom, IUD, cervical diaphragm)
c. Oral contraceptive pill
d. Topical spermicidal agent
e. I have had a tubal ligation
f. My partner has undergone a vasectomy
g. I use Depoprovera or Norplant

Your age: Today's Date: Date of your surgery:

RESULTS

The data collected from the patient histories indicated that only 21 patients should have undergone preoperative testing. These assessments were made based on inconclusive information regarding last menstrual period, sexual activity and the use of contraception. Even with our concerns from the histories, only one of the 21 tested positive. That particular patient indicated on the questionnaire that there was no chance that she could be pregnant, but said that she was sexually active and used a barrier method (condom) for contraception. The most useful piece of information from that patient was that the first day of her last menstrual period had been on 01 November. She was seen in the preanesthesia clinic on 29 November and was scheduled for surgery the following day and had yet to start her menses, which would have prompted testing. As can be seen on the questionnaire, we included natural family planning, barrier methods, oral contraceptives, topical agents, surgical sterilization, Norplant and Depoprovera as possible contraceptives. Tables 2 and 3 show a summary of the data from our study.

Figure 2

Table 2: Patient Characteristics

Patients (n=216)	
Average Age	33.83 years (range 13-56)
Number of Sexually Active	162 (75.00%)
Number Using Some form of Contraception	201 (93.05%)
Number Recommended for Testing	21 (10.71%)
Number of Positive Pregnancy Tests	1 (0.46%)

Figure 3

Table 3: Methods of Contraception in Studied Population

Type	Number Using This Type
Natural Family Planning	6 (2.78%)
Barrier Methods	33 (15.28%)
Oral Contraceptives	62 (28.70%)
Topical Agents	7 (3.24%)
Tubal Ligation	24 (11.11%)
Vasectomy	41 (18.98%)
Depoprovera/Norplant	7 (3.24%)

DISCUSSION

After careful examination of 216 questionnaires and pregnancy test results, we found one positive test. These results demonstrate, in our patient population, that the likelihood of finding a positive preoperative pregnancy test is extremely low. In fact, other studies of both adult and adolescent patients have shown that a positive preoperative pregnancy test is a rare entity. Malviya and colleagues at the University of Michigan found no positive pregnancy tests

out of 444 adolescents presenting for ambulatory surgery. [3] In another study with adolescent patients, Pierre and associates reviewed the pregnancy test results of 801 12-21 year olds and found only four positive tests.[4] Finally, a study of 2,056 patients presenting for ambulatory surgery yielded only seven positive results, an incidence of 0.3%.[5] These studies along with our results warrant reevaluation of the current testing protocol at our institution.

This investigation demonstrated that a thorough history regarding the possibility of pregnancy is accurate and sufficient for adequate preanesthetic evaluation. This is significant for two reasons. First, the use of this questionnaire could be used in place of mandatory pregnancy testing. This would save thousands of dollars each year. This estimated savings is based on the number of preoperative pregnancy tests performed in one year at our institution. The issue of cost-effectiveness has been raised on numerous occasions in the literature. Kettler showed that the cost of detecting one pregnancy in adult patients is about $7,750. [6] His calculations were based on the number needed to be treated (NNTT), or in this case the number of pregnancy tests needed in order to detect one positive result. The other potential significance of this questionnaire is that it would greatly reduce the number of surgical delays secondary to waiting for results of a preoperative pregnancy test. The questionnaire can easily be filled out in less than sixty seconds by the patient and reviewed by the physician in the same amount of time.

There will be those who will argue that the risk of anesthesia and surgery are worth the time and money spent on mandatory preoperative pregnancy testing. As was mentioned earlier, an exhaustive review of the anesthesia and perioperative literature revealed no sound scientific evidence that anesthetic agents used in clinical concentrations are harmful. There is concern that surgery itself, particularly intra-abdominal surgery, may lead to a higher incidence of spontaneous abortion. 1 However, there are studies that have shown no increase in miscarriages associated with surgery during pregnancy. If there is no historical information indicating that the patient might be pregnant, it is our contention that testing not be done.

CONCLUSIONS

Our study was conducted to see if we as anesthesiologists could make the preoperative assessment of female patients friendlier, quicker and more cost effective, while being vigilant about their overall well being. We feel that our clinical data shows that a thorough history is the backbone of medicine and can be used to determine the need for various tests and procedures. In this case, a questionnaire proved to be a useful tool for the perioperative physician who is deciding which tests need to be ordered before an elective surgical procedure. Our contention is that our department should eliminate the requirement of mandatory preoperative pregnancy testing for elective procedures. Instead, a thorough history should be used to guide preoperative pregnancy testing. This approach would be safe, efficient and cost-effective.

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References

1. Santos A, Pederson H, Finster M: Obstetric Anesthesia, Clinical Anesthesia, 3rd edition. Edited by Barash PG, Cullen BF, Stoelting RK.Philadelphia, Lippincott -Raven Publishers, 1997, pp 1085-1087
2. Roizen MF, Cohn S: Preoperative evaluation for elective surgery: What laboratory tests are needed? Advances in Anesthesia, Chicago, Mosby-Year Book, 1993, vol 10, p 25.
3. Malviya S, D'Errico C, Reynolds P, Huntington J, Voepel-Lewis T, Pandit UA: Should pregnancy testing be routine in adolescent patients prior to surgery? Anesthesia and Analgesia 1996;83(4):854-8
4. Pierre N, Moy LK, Redd S, Eman SJ, Laufer MR: Evaluation of a pregnancy-testing protocol in adolescents undergoing surgery. Journal of Pediatric & Adolescent Gynecology 1998;11(3):1339-41
5. Manley S, de Kelaita G, Joseph NJ, Salem MR, Heyman HJ: Preoperative pregnancy
6. testing in ambulatory surgery. Incidence and impact of positive results. Anesthesiology 1995;83(4):690-3
7. Kettler R: The Cost of Preoperative Pregnancy Testing. Anesthesia and Analgesia 1996;83:439

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