

Herbal Medicine Use in Parturients

David L. Hepner, MD, Miriam Harnett, MD, Scott Segal, MD, William Camann, MD, Angela M. Bader, MD, and Lawrence C. Tsen, MD

Department of Anaesthesia, Perioperative and Pain Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts

Alternative medicine use has increased dramatically over the last decade. Recently a 22% incidence of herbal medicine use in presurgical patients was reported. Of concern is the potential for these medications to cause adverse drug-herb interactions or other effects such as bleeding complications. We sought to determine the prevalence and pattern of use of herbal remedies in parturients. A one-page questionnaire examining the use of all prescription and nonprescription medications, including herbal remedies, was sent to parturients expected to deliver within 20 wk who had preregistered

with the hospital's admissions office. Sixty-one percent of the parturients responded to the survey, with 7.1% of parturients reporting the use of herbal remedies. Only 14.6% of users considered them to be medications. Parturients in the 41–50 yr age bracket (5.6% of parturients) were the most likely to use herbal remedies (17.1% rate of use in this age group). Many parturients who took herbal remedies (46%) did so on the recommendation of their health care provider.

(Anesth Analg 2002;94:690–3)

Complementary and alternative medicine (CAM) use is becoming more common in the United States (US), with a prevalence of 42% and a cost of 27 billion dollars in 1997 (1). Among these treatments, herbal remedies are very popular and are second only to relaxation techniques as the most common type of alternative therapy (1). Recent data have estimated that 91 million Americans, or approximately 49% of the adult population in the US, have used an herbal product during the previous year (2). The same data noted that consumers now spend \$5.1 billion on herbal remedies, and approximately 24% of the US population (44.6 million) are regular users of herbal remedies. Although <40% who take herbal remedies disclose their use to physicians (1), we recently reported a 22% incidence of herbal remedy use in the presurgical patient population and observed a more frequent pattern of use in women and patients aged 40–60 yr old (3).

There is little information on the use of such remedies in the parturient population. Our own prior survey did not study parturients, as few present specifically for presurgical assessment. Anecdotally we noted that

many parturients did not spontaneously mention the use of herbal remedies. However, we hypothesized that their use may be less frequent than in the presurgical population because of concerns about pregnancy and fetal well-being. Interestingly, a recent report from North Carolina found that among certified nurse-midwives (CNMs), 93.9% and 73.2% recommended CAM and herbal remedies respectively (4). The same report noted the absence of literature regarding the use of CAM prescribed by obstetricians.

We decided to focus on one aspect of CAM, herbal medicines, in this survey because the use of herbal remedies in females has been noted to be frequent, may be promoted by obstetric health care providers, and may have potentially more complex untoward side effects for the parturient as well as for the fetus. More specifically, as regional anesthesia is the most popular form of labor analgesia, the potential for increased bleeding tendencies (5,6), and alteration in maternal hemodynamics (7,8), side effects of some patented Asian medicines and nonpatented American herbal preparations, are valid concerns. In addition, ginger has been associated with mutagenesis in a culture of *Escherichia coli* (9). The inhibition of fetal binding of testosterone has been postulated with maternal ingestion of ginger, as it is a potent thromboxane synthetase inhibitor (10). Consequently, this questionnaire-based study was prepared to better understand the prevalence of herbal remedies in the parturient population.

Presented, in part, at the annual meeting of the Society for Obstetric Anesthesia and Perinatology (SOAP), Montreal, Canada, June 1–4, 2000.

Accepted for publication November 13, 2001.

Address correspondence and reprint requests to David L. Hepner, MD, Department of Anaesthesia, Perioperative and Pain Medicine, Brigham and Women's Hospital, Harvard Medical School, 75 Francis Street, Boston, MA 02115. Address e-mail to dhepner@partners.org.

Methods

After approval by the hospital's Committee for the Protection of Human Subjects, a one-page questionnaire was sent to all parturients who anticipated a delivery at the Brigham and Women's Hospital over a 13-wk period (January–March 2000). The questionnaires were included as part of an antepartum package routinely sent by the hospital to all parturients at approximately 20 wk gestational age regarding the labor and delivery process. The questionnaires were printed in English and Spanish as these account for the first language of most of our parturients. If a questionnaire was not returned on arrival of the parturient for labor and delivery, a second questionnaire was given at the time of the preanesthesia consultation and collected on neonatal delivery. The questionnaire asked for the number of prior pregnancies, the number of children, the parturients' age and whether the pregnancy was achieved via *in vitro* fertilization. The use of all prescription and nonprescription medications, including herbal remedies, was noted, together with the reason they were started or stopped, as well as the types of labor analgesia being considered. Parturients were specifically queried regarding the use of 23 commonly used herbal remedies and spaces were provided for writing in any unnamed herbal remedy. Finally, parturients were asked whether they considered these herbal remedies to be medications. Results were analyzed using appropriate descriptive statistics and differences between various groups of patients were tested by χ^2 analysis with continuity correction. $P < 0.05$ was considered statistically significant.

Results

A total of 1203 questionnaires were mailed and 734 were eventually collected for a response rate of 61%. A total of 7.0% of nulliparas and 7.7% of multiparas reported the use of any herbal remedy (not significant, NS). The use of herbal remedies was most frequent among parturients in the 41–50 yr-old group (7/41 or 17.1%), compared with 4.8% (5/104) in the <20-yr-old group, 6.3% (19/300) in the 20–30-yr-old group, and 7.3% (21/289) in the 31–40-yr-old group; this trend of increased use in older parturients did not reach statistical significance ($P = 0.2$). The three most commonly used herbal remedies among parturients were echinacea, St. John's wort, and ephedra. The most commonly used herbal and over-the-counter remedies are shown in Tables 1 and 2, respectively. Forty-six percent of parturients who used herbal remedies reportedly did so at the recommendation of their health care provider. The remaining 54% took such remedies because of a friend or family member's recommendation, an advertisement, or by their own decision. Once pregnancy was confirmed, 8.9% and 21.2% of parturients

discontinued the use of herbal remedies (ephedra being the most common one) and nonprescription medications, respectively. Fourteen percent of parturients considered herbal remedies to be medications and 41.6% did not, with the remaining percentage unaware of whether herbal remedies were medications.

The pattern of use was similar whether or not the parturient considered herbal remedies to be medications ($P = 0.7$). The pattern of discontinuation with confirmation of pregnancy, however, was more likely, approaching statistical significance ($P = 0.06$), if the parturient believed they were medications. The most common reasons cited for stopping medications during pregnancy were concerns regarding potential fetal risks and recommendations by an obstetrician. There was a trend toward increased herbal medicine use among women planning natural childbirth compared with those who did not (10.1% versus 6.3%, $P = 0.1$). Women planning to receive epidural analgesia were no more likely to take herbal preparations than were those who were planning no analgesia (7.4% versus 8.6%, NS).

Discussion

Alternative medicine use and expenditures have increased steadily, with certain alternative therapies now being included in some insurance plans (1). In response, US medical schools are starting courses in CAM (11,12) and many medical associations, including the ASA (13,14), have developed pamphlets regarding the use of such remedies in the perioperative period. Although some publications have suggested the discontinuation of all herbal medicines two weeks before surgery (15), a more targeted approach based on pharmacokinetic data of active compounds has been recently suggested (16). However, as herbal medicines are considered "dietary supplements" by the Dietary Supplement Health Education Act (17), they are neither governed by federal regulations that establish criteria for purity, identification, and manufacturing, nor are they subject to the same adverse reporting rules of the Food and Drug Administration (18). As "dietary supplements," these remedies cannot claim to cure or treat disease, but they can be marketed for certain "conditions." Of specific concern during pregnancy is that some remedies are being marketed for such "conditions" as nausea and vomiting (19), despite limited evidence to support their efficacy (20). For example, a review of 10 studies assessing the effects of alternative therapies on first trimester nausea and vomiting included only one small trial evaluating an herbal remedy, ginger (20).

Our principal finding was that parturient use of herbal remedies, in a tertiary care teaching and private hospital, is infrequent. Our population consists largely of healthy parturients with only 7.1% reporting the use of herbal

Table 1. Herbal Medicine Use

Preparation	% of All Parturients	% of Parturients taking herbal remedies
Aloe (<i>n</i> = 2)	0.27	3.8
Cranberry (<i>n</i> = 4)	0.5	7.7
Echinacea (<i>n</i> = 19)	2.6	36.5
Ephedra (<i>n</i> = 13)	1.8	25
Garlic (<i>n</i> = 4)	0.5	7.7
Ginger (<i>n</i> = 5)	0.7	9.6
Ginkgo biloba (<i>n</i> = 5)	0.7	9.6
Ginseng (<i>n</i> = 5)	0.7	9.6
Primrose (<i>n</i> = 5)	0.7	9.6
St. John's wort (<i>n</i> = 10)	1.4	19.2
Valerian (<i>n</i> = 3)	0.4	5.8
Two herbal remedies (<i>n</i> = 11)	1.5	21.1
≥3 herbal remedies (<i>n</i> = 8)	1.1	15.4
Any herbal medicine (<i>n</i> = 52)	7.1	100

Total number of surveys returned = 734.

Table 2. Over the counter medications

Preparation	% of All Parturients	% of Parturients taking OTC medications
Cold remedies (<i>n</i> = 129)	17.6	23.2
Pain relievers (<i>n</i> = 273)	37.2	49.2
Heartburn medications (<i>n</i> = 153)	20.8	27.6
Any OTC medication (<i>n</i> = 555)	75.6	100

Total number of surveys returned = 734.
OTC = over the counter.

remedies, and this incidence was significantly less than the 22% observed in the general presurgical population at the same institution (3). With the growing popularity of herbal preparations, however, an increased incidence will most likely be observed. This is particularly true because few parturients consider these remedies to be medications and many obstetric providers, particularly CNMs, are encouraging their use (4). In part, this encouragement stems from isolated reports suggesting the use of herbal remedies for assisting breech version attempts, arresting premature labor, augmenting cervical ripening and labor, and for providing analgesia during labor (21,22). Commonly used herbal preparations for labor stimulation included blue cohosh, black cohosh, red raspberry leaf, castor oil, and evening primrose oil (22). Finally, more older parturients may be expected because of the increased use of *in vitro* fertilization therapies, and this population is more likely to use herbal remedies, as has been demonstrated in our study and previously (1,3). The small number of parturients younger than 20 years old and older than 40 years may be part of the reason that our present results regarding age did not reach statistical significance.

Multiple drug-herb interactions have been described and may result in untoward effects. Feverfew has been shown to inhibit platelet activity, garlic has been associated with decreased platelet aggregation, ginger is a potent inhibitor of thromboxane synthetase, ginkgo is a potent inhibitor of platelet-activating factor, and ginseng has an antiplatelet

component (5). Therefore, feverfew, garlic, ginkgo, ginger, or ginseng alone may alter bleeding time, should not be used concomitantly with other medications that affect coagulation, and caution should be used when considering regional analgesia (5). Of note, a spontaneous epidural hematoma reported in an 87-year-old man is believed to be associated with significant amounts of ingested garlic (6). *Hypericum perforatum*, commonly referred to as St. John's wort, is one of the more commonly used herbal medicines in presurgical patients (3.3%) and in parturients (1.4%). Containing different quantities of at least 10 constituents in different formulations, the purported mechanism of action is via a selective serotonin reuptake inhibition or monoamine oxidase inhibition. The coadministration of St. John's wort and meperidine, one of the most commonly used labor analgesics, could potentially result in hyperthermia, hypertension, hypotension, rigidity, seizures, and coma (23). In addition, in the presence of St. John's wort, physician-administered ephedrine given to treat hypotension, may have an accentuated response because of more neurotransmitter available for release (23). However, the degree of monoamine oxidase inhibition and serotonin reuptake inhibition may eventually be found not to have clinically significant interactions. Other complications from herbal preparations include precipitous labor, tetanic uterine contractions, nausea, and vomiting (22).

Limitations in our questionnaire-based evaluation of herbal remedy use may include differences in response

rate, disclosure rate, recall bias, and obstetric care preferences. Our results may have underrepresented the actual number of herbal remedy users, as in the general population <40% of patients disclose the use of CAM to their physicians (1). In addition, parturients may not remember or even know what herbal remedies they were taking, especially if more than one remedy is present in a specific preparation. For example, 7% of herbal remedies in California retail herbal stores contained undeclared pharmaceuticals, with ephedrine being among the most common undeclared ingredients (7). Moreover, some parturients hoping to receive our services may have denied current use of remedies in hopes of not presenting a contraindication to regional analgesia. However, those more interested in herbs may have been more prone to fill out our survey. In addition, although we did not differentiate between obstetric care providers, at our own institution often both obstetricians and CNMs care for a parturient. Although we did not discriminate how often remedies were taken (single versus regular use in pregnancy) or started (before or during pregnancy), the question of quantity and duration of use of herbal remedies remains unknown. Until a causal relationship between use and effect is more clearly established, even a single use may be detrimental for the parturient and/or fetus. Finally, although our response rate was only 61%, our hospital is a tertiary referral center and a portion of our parturients present as transfers from outside institutions with complex medical and fetal issues. It was our policy not to approach high-risk parturients or parturients with fetal anomalies with our survey. With the event of birth, some parturients elected not to complete the questionnaire. We consider this unavoidable because of the special nature of this life event. However, these omissions could theoretically have biased our results.

In summary, our results are in agreement with prior studies (1,3) that reported an increased use of herbal medications in the fifth decade of life, even though only a small number of parturients were in this age group. Health care providers recommended these therapies even during pregnancy, and the vast majority of parturients did not consider these herbal remedies to be medications. Therefore, it is reasonable to expect an increase in the use of herbal medications in parturients. At present, there are no data that address whether to stop these remedies before surgery or labor and delivery, when to stop them, or if there is an increased maternal or fetal morbidity and mortality associated with their use. Anesthesia providers should ask routinely about their use during the preanesthesia consultation, be familiar with their side effects and drug interactions, and play a leading role in conducting clinical trials that address the use and potential interactions of CAM during the peripartum period.

The authors thank Eleanor R. Menzin, MD for the idea that led to the conduction of this study, for her insightful comments and suggestions, and for a careful review of the manuscript.

References

1. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990-1997. *JAMA* 1998;280:1569-75.
2. Blumenthal M. Interactions between herbs and conventional drugs: introductory considerations. *Herbal Gram* 2000;49:52-63.
3. Tsen LC, Segal S, Pothier M, Bader AM. Alternative medicine use in presurgical patients. *Anesthesiology* 2000;93:148-51.
4. Allaire AD, Moos M-K, Wells SR. Complementary and alternative medicine in pregnancy: a survey of North Carolina certified nurse-midwives. *Obstet Gynecol* 2000;95:19-23.
5. Miller LG. Herbal medicinals: Selected clinical considerations focusing on known or potential drug-herb interactions. *Arch Intern Med* 1998;158:2200-11.
6. Rose KD, Croissant PD, Parliament CF, Levin MP. Spontaneous spinal epidural hematoma with associated platelet dysfunction from excessive garlic ingestion: a case report. *Neurosurgery* 1990;26:880-2.
7. Ko R. Adulterants in Asian patent medicine [letter]. *N Engl J Med* 1998;339:847.
8. Angell M, Kassirer JP. Alternative medicine-the risks of untested and unregulated remedies. *N Engl J Med* 1998;339:839-41.
9. Fischer-Rasmussen W, Kjaer SK, Dahl C, Asping U. Ginger treatment of hyperemesis gravidarum. *Eur J Obstet Gynecol Reprod Biol* 1991;38:19-24.
10. Backon J. Ginger in preventing nausea and vomiting of pregnancy: a caveat due to its thromboxane synthetase activity and effect on testosterone binding. *Eur J Obstet Gynecol Reprod Biol* 1991;42:163-4.
11. Eisenberg DM. Advising patients who seek alternative medical therapies. *Ann Intern Med* 1997;127:61-9.
12. Wetzel MS, Eisenberg DM, Kaptchuk TJ. Courses involving complementary and alternative medicine at US medical schools. *JAMA* 1998;280:784-7.
13. American Society of Anesthesiologists. Considerations for anesthesiologists: what you should know about your patients' use of herbal remedies. Available at: <http://www.asahq.org/ProfInfo/herb/herbro.html>. Accessed October 22, 2001.
14. American Society of Anesthesiologists. What you should know about herbal use and anesthesia. Available at: <http://www.asahq.org/PublicEducation/insidherb.html>. Accessed October 22, 2001.
15. Leak JA. Herbal medicines: what do we need to know? Available at: http://www.asahq.org/NEWSLETTERS/2000/02_00/herbal0200.html. Accessed October 22, 2001.
16. Ang-Lee MK, Moss J, Yuan C-S. Herbal medicines and perioperative care. *JAMA* 2001;286:208-16.
17. US Food and Drug Administration. Dietary Supplement Health and Education Act of Public Law 103-417. Available at: <http://www.fda.gov/opacom/laws/dshea.html>. Accessed October 22, 2001.
18. Slifman NR, Obermeyer W, Aloï BK, et al. Brief report: contamination of botanical dietary supplements by digitalis lanata. *N Engl J Med* 1998;339:806-11.
19. Landrigan PJ, Wolfe S, Oakley GP. Bad policy, worse medicine. *Pediatrics* 2000;106:1482-3.
20. Murphy PA. Alternative therapies for nausea and vomiting of pregnancy. *Obstet Gynecol* 1998;91:149-55.
21. Chez RA, Jonas WB. Complementary and alternative medicine. Part I: clinical studies in obstetrics. *Obstet Gynecol Surv* 1997;52:704-8.
22. McFarlin BL, Gibson MH, O'Rear J, Harman P. A national survey of herbal preparation use by nurse-midwives for labor stimulation. *J Nurse Midwifery* 1999;44:205-16.
23. Wells DG, Bjorksten AR. Monoamine oxidase inhibitors revisited. *Can J Anaesth* 1989;36:64-74.