Research on Acupuncture in Pregnancy and Childbirth: The U.S. Contribution

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ABSTRACT

Background: Along with an increasing use of acupuncture to treat pregnancy and childbirth concerns comes a need to assess the current state of related research, which is a critical step in defining a research agenda.

Objective: The goal of this article is to analyze the U.S. contribution to obstetric acupuncture research against the backdrop of professional positions and relevant historical events.

Methods: Original obstetric acupuncture research articles published post-1998 (147) and pre-1998 (62) were reviewed. Studies were placed into topical categories (e.g., breech correction, labor, and delivery), and the current authors identified region of study origin, study focus and type, gestational timing of treatment, general study outcomes, and adverse events. U.S. study characteristics were analyzed relative to those of other regions.

Results: The number of obstetric acupuncture publications more than tripled from pre- to post-1998, and the United States ranked third (behind the European region and China) in published articles. One case study indicated a serious adverse effect. Most post-1998 U.S. articles focused on pregnancy concerns; those conducted in early pregnancy involved acupressure. Acupuncture benefits varied by study topic.

Conclusions: U.S. studies reflected greater effort toward treating pregnancy-related problems, compared to childbirth and postpartum concerns. The U.S. research contribution is discussed within the context of health care system structure, professional concerns, funding, and the role of conventional biomedical care in advancing a successful research agenda.

Key Words: Acupuncture, Obstetrics, Pregnancy, Childbirth

INTRODUCTION

EUROPEAN STUDIES INDICATE that 4%–13% of obstetric patients receive acupuncture treatment for pregnancy and childbirth concerns.^{1,2} Although analogous data were not found for the United States, U.S. acupuncture treatment expenditures are on the rise,^{3,4} which would suggest increasing use among obstetric patients as part of the overall trend. Authors of reliable research reviews^{5–14} of acupuncture treatment for concerns such as nausea and vomiting in pregnancy (NVP), mood symptoms, breech correction, labor initiation, and pregnancy and birth pain, generally conclude that acupuncture confers some benefit, but these researchers also agree that high-quality

evidence is lacking. As a global leader in medical research and with rising national acupuncture expenditures, the United States has a call to advance the study of obstetric acupuncture treatment. This study was conducted to help advance this research by reviewing characteristics of U.S. obstetric acupuncture studies in relationship to global research and to address contextual and professional factors relevant to the endeavor.

Historical Events and ACOG Influence on the Climate of Research on Pregnancy

In December 1998, the American College of Obstetricians and Gynecologists (ACOG) provided a committee opinion

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affirming the need for research involving pregnant women.¹⁵ The ACOG acknowledged historical reluctance to conduct this research because of “concerns for the potential to do harm to the fetus,” proposing that such concerns had slowed development of beneficial treatments. The opinion came partly in response to evidence of reduced human immunodeficiency virus (HIV) transmission to offspring of infected pregnant women who were treated with azidothymidine (AZT), which had aroused concerns regarding adverse effects on fetal development.¹⁵ The ACOG’s opinion came shortly after the July 1998 U.S. Food and Drug Administration approval¹⁶ of thalidomide, which also intensified concerns about adverse effects of medical treatment in pregnancy. Thalidomide had once been used to treat pregnancy symptoms but was later banned^{17,18} after the discovery that it caused severe birth defects. Although the FDA approved the drug only to treat leprosy and created restrictions on prescribing thalidomide to women,¹⁶ concerns about risk of misuse in pregnancy nevertheless remained.^{19,20} In short, the ACOG opinion came about in a time of heightened concern surrounding the risks of medical treatments in pregnancy.

The U.S. Acupuncture Community Position on Obstetric Acupuncture

Obstetrics is an established practice specialty in the United States, conventional biomedical community. Thus, the field has specialty journals and professional organizations, such as the ACOG. With a shorter professional history in the United States, compared to China and Europe, acupuncture has no officially recognized specialty analogous to conventional obstetrics, although there is a national organization for reproductive disorders (the American Board of Oriental Reproductive Medicine). Two other organizations cover the full range of acupuncture practice: the American Academy of Medical Acupuncture (AAMA), in which membership is open only to physicians with acupuncture credentials; and the American Association of Acupuncture and Oriental Medicine (AAAOM), with less-restrictive membership requirements.

Perhaps unsurprisingly, no formal position was found on obstetric acupuncture research issued by the general practice organizations AAMA or AAAOM. Considering how concern about adverse effects has influenced the culture of conventional U.S. medical treatment of pregnant women, reports were searched to learn of adverse events that may have influenced obstetric acupuncture research. In a 1991 case study of a pregnant woman,²¹ the authors, pulmonary and critical care physicians, attributed a patient’s respiratory distress to acupuncture treatment for asthma. The patient

“eventually bore a healthy full-term infant,” indicating no adverse effects on fetal development. No other documentation was found regarding specific adverse events potentially influencing U.S. obstetric acupuncture research.

However, so-called “forbidden points” have aroused concern for their potential abortifacient or premature labor-inducing effects, and an overview of the debate surrounding “forbidden points” provides useful context. A 2011 issue of *Acupuncture in Medicine* published a series written by respected obstetric acupuncture researchers, all from outside the United States.^{22–24} The authors of this series agreed that concerns about “forbidden points” were likely to have originated in vague references in ancient Chinese medical texts but recommended varying levels of caution in response to those admittedly obscure references: Betts and Budd²² recommended a cautious approach; whereas the other authors proposed that unsubstantiated concerns were hampering treatment progress.^{23,24} Cummings²³ argued that no clear mechanism of effect existed for “forbidden points,” and Guerreiro da Silva stated that his team²⁴ had been “vehemently attacked” by individuals who worried about unsupported “forbidden points” claims. From a practical standpoint, British acupuncturist Forrester²⁵ wrote: “The American...fear of litigation may be more influential” in professional attitudes than “a sensible review of the evidence.” Forrester cautioned against practicing acupuncture in the first trimester to avoid misplaced blame for potential miscarriage.

Although the “forbidden points” controversy may be baseless, it nevertheless remains unresolved and seems to underlie the U.S. medical acupuncture treatment community’s attitudes, reflected in a 1999–2000 *Medical Acupuncture* (the official journal of the AAMA), statement²⁶ urging avoidance of acupuncture in pregnancy. In a review of four obstetrics and gynecology abstracts, one focused specifically on pregnancy in treatment of severe vomiting and referred to using the proper technique on point SP 4 to avoid premature rupture of membranes. The reviewer, Erickson,²⁶ commented:

Adding SP 4, given any chance of a premature delivery, should not be done in the United States. I am hesitant still, following Dr Helm’s [*sic*] advice in the UCLA [University of California, Los Angeles] program, to needle a pregnant woman...until acupuncture is more widely accepted and its safety given full cognizance here.

The Dr. Helms of Erickson’s²⁶ quote is Joseph M. Helms, MD, FAAMA, a physician, a founding AAMA president, and director of an acupuncture training program for practicing physicians.²⁷ Dr. Helms was contacted to verify the accuracy of Erickson’s²⁶ statement, but no response had been received

by the time this article was reviewed for publication.* Only one of the four recommended “obstetrics and gynecology” articles on the Helms Medical Institute public domain publications page²⁸ involved pregnant women²⁹ and had inclusion criteria of 31 weeks of gestation.

In sum, a 1998 ACOG statement encouraged research involving pregnant women, addressing reluctance to do so because of concerns about potentially deleterious developmental effects of treatment. One case report was found that described adverse acupuncture effects in pregnancy related to maternal but, not directly to fetal, health. Only one explicit statement generally discouraging needling in pregnancy was found,²⁶ and the current authors were unable to verify the accuracy or timeliness of the recommendation; however, Forrester²⁵ suggested that litigation concerns may generally deter obstetric acupuncture practice. In the absence of other published references, the current authors cannot determine how these isolated views have influenced obstetric acupuncture research.

Aims of the Current Study

To restate an earlier point, because the United States is viewed as a global leader in medical research, it was considered critical to shed light on the current state of U.S. obstetric acupuncture research relative to other global regions. Thus, relevant studies were reviewed for specific topics addressed, study type, gestational timing of treatment, general study outcomes, and reported adverse events. The searches were conducted during two distinct time periods, starting with the years subsequent to the ACOG’s committee opinion,¹⁵ or December 1998 to December 2012 (period II). For comparison purposes, literature from the 14-year period preceding the opinion was examined; this period ran from December 1974 to November 1998 (period I). With little more than an isolated case study and published statements discouraging acupuncture in pregnancy, no differences were expected in publication patterns between the United States and global regions except for China. Given that the discipline probably originated in China, acupuncture there has a more extensive history and central role in that country’s health care culture than in Western nations,³⁰ so it was anticipated that there would be more publications from China than from the United States.

*Subsequent to editorial review, Dr. Helms responded to the written request for an update on the *Medical Acupuncture* published statement expressly discouraging needling in pregnancy. Dr. Helms stated that, “while there are neither publications nor lore of any quality that suggest that acupuncture can provoke abortion or premature labor,” he continued to advise twenty-first century physicians not to needle in pregnancy to avoid misplaced blame for adverse pregnancy outcomes (Joseph M. Helms, MD, FAAMA, personal communication, January 9, 2013).

METHODS

Medline®/PubMed and CINAHL [Cumulative Index to Nursing and Allied Health Literature] databases were searched for articles first from December 1998 to December 2012 (period II), followed by a repeat search for period I (December 1974 to November 1998). Search terms were pregnancy + complementary and alternative medicine, childbirth + complementary and alternative medicine, pregnancy + acupuncture, and childbirth + acupuncture.

Believing that original data most directly reflects the state of clinical research, articles that were included were only those with a Medline/PubMed “Publication Type” of case reports, clinical trials, comparative studies, controlled clinical trials, evaluation studies, randomized controlled trials, and validation studies. Reviews, meta-analyses, and so on, were excluded. Similarly, only articles with CINAHL publication type of case reports, clinical trials, and randomized controlled trials were included. Because *Medical Acupuncture* is not abstracted in these available databases, 41 individual issues of this journal, from December 1998 to December 2012 were searched through either the AA-MA’s³¹ or the publisher’s³² websites.

The following information was collected from each article: (1) country in which the research was conducted; (2) research topic; (3) gestational timing of acupuncture; (4) study type; (5) acupuncture benefits; and (6) adverse events. On the second point (research topic), five obstetric research categories were developed, drawn from Chen and colleagues:³³ (1) pregnancy concerns (e.g., NVP, pain); (2) conversion/correction of breech position; (3) blood supply to fetus; (4) labor and delivery processes (e.g., labor analgesia, labor induction); and (5) postpartum concerns (e.g., pain, lactation support).

RESULTS

Articles Retrieved and Exclusions: 1998 to 2012 (Period II)

For this 14-year period, the Medline/PubMed database yielded 144 records; CINAHL yielded 55, with only 7 non-overlapping with Medline. Of the 7 unique CINAHL articles, 4 had no published abstracts and were not available through either author’s respective library (*Journal of the Acupuncture Association of Chartered Physiotherapists*). From the 147 available database-identified articles, 57 were dropped because they did not involve obstetrics, instead focusing on, for example, fertility treatment (32 articles), professional practice, or scale development. One study was dropped because it was published in a language (German) other than those read by either author. This left 90 database-retrieved articles, to which the review of 41 *Medical Acupuncture* issues yielded 3, for a total 93 publications reviewed. A complete list of references is available from the first author of this current article.

Published study contributions by country. Twenty-two countries contributed to the total period II 93 articles, and those nations were placed in geographic regions for parsimony. American nations excluding the United States (Canada, Brazil) contributed 6 (6.5%) articles, as did Australia and New Zealand together. Asian nations excluding China (India, Iran, Japan, Korea, Thailand) contributed 8 articles (8.6%). China (including Taiwan) contributed 21 articles (22.6%), Egypt contributed 1 article (1.1%), the European region (Austria, Croatia, Denmark, England, France, Germany, Italy, Norway, Sweden, Switzerland) contributed 39 articles (41.9%). The United States contributed 12 articles (12.9%). Relative to individual countries, the United States contributed 1 article more than Sweden's total of 11.

Research categories by country. Two Chinese studies addressed concerns in two separate categories, resulting in 95 total article topics placed in the breech, fetal blood supply, pregnancy concerns, labor and delivery process, and/or postpartum concerns categories.

Across all regions, 9 (9.5%) study topics were categorized under breech correction, 1 (1.1%) was placed in the fetal blood supply category, 37 (39.0%) were on labor and delivery process concerns, 36 (37.9%) were on pregnancy concerns, and 12 (12.6%) were on postpartum concerns. Category percentages by country are detailed in Table 1.

In addition, across all regions, subcategories within the 5 primary categories were identified. Of the 36 subtopics within the pregnancy concerns category, half (18) were on NVP, one-third (12) were on pain (pelvic, back, migraine), 4 were on mood treatment, and 1 each were on Bell's palsy and insomnia. In the labor and delivery process category, of the 37 subcategories, 17 (45.9%) focused on analgesia for labor or obstetric procedures, 10 (27.0%) focused on labor initiation or induction, and the remainder focused on labor augmentation, general labor support, or side-effects of medical analgesia/anesthesia. The 12 postpartum concerns studies focused on lactation support and other concerns, such as postpartum bleeding.

Gestational timing of treatment. Acupuncture treatment in all 37 labor and delivery category studies were conducted either near or at term (e.g., cervical ripening or labor initiation) or during labor itself (analgesia or augmentation). Treatment in the 9 studies on breech conversion/correction was conducted in the third trimester.

Of the 36 studies on acupuncture for pregnancy concerns, 1 was in Chinese and gestational timing of treatment could not be determined from the English-language abstract, and 2 did not report gestational timing, leaving 33 for the analysis. Of the 33, 15 (45.5%) were conducted in the first trimester; NVP was the focus of most (14), and 1 focused on pain treatment that predated the pregnancy. In 2 of 18 total

studies on NVP, treatment began early in the second trimester (12–14 weeks). Of the 14 first-trimester NVP studies, 8 (57.1%) did not involve needling, instead using acupressure, acupressure bands, or acustimulation (Asia=3; Australia=1; European Union=2; United States=2).

The remaining studies conducted in the second trimester and beyond focused on pain treatment, emotional concerns, insomnia, and Bell's palsy (see *Research categories by country*). Of the 6 U.S. studies on treating pregnancy concerns in the second trimester, 1 was on acupressure for NVP treatment, conducted at 12–14 weeks' gestation. The remaining 5 studies involved second-trimester gestation and later treatment for emotional concerns or pain.

Study types and general outcomes. Of the 93 studies, most (79; 84.9%) involved randomizing participants to an acupuncture treatment or 1 or more comparison groups (e.g., sham acupuncture, massage, usual care), referred to as randomized controlled trials (RCTs) herein. Ten (10.8%) were case studies, and the remaining 4 were naturalistic acupuncture treatment outcome studies.

Across RCTs, differences in acupuncture treatments (e.g., acupuncture, moxibustion, electroacupuncture, acupressure, or acustimulation; points needled; treatment duration; treatment setting), control groups (e.g., sham acupuncture, standardized versus individualized treatment, acupuncture plus medication, acupuncture versus no treatment), blinding (single or double), outcome measures (e.g., self-report, provider report, rating scales, obstetric indicators, laboratory measures), gestational timing of treatment, sample sizes, and statistical approaches warrant a complex analysis of study results that is beyond the scope of this article. However, to provide a general sense of study outcomes, RCTs were categorized as indicating "acupuncture benefit" if the focal acupuncture treatment group evidenced statistically significant benefit beyond that of the comparison group(s) on one or more of the study's primary measures.

As shown in Table 1, reported acupuncture benefits appeared in 0%–100% of each region's published studies. The breech correction and postpartum concerns categories had the highest percentages of studies showing benefits, at 66.7+ % and 75+ %, respectively, followed by the pregnancy concerns category, in which 50+ % of studies indicated acupuncture benefits. The labor and delivery process category evidenced the greatest variability, with the United States and Australia/New Zealand indicating significant benefit in 0% of their published studies, the European Union in 54.5%, and China and the Americas in 93+ %.

Of the three categories in which the U.S. publications appeared (breech correction, pregnancy concerns, labor and delivery process), RCTs were available in two: pregnancy concerns and labor and delivery process. The 4 pregnancy concerns studies all demonstrated significant benefit, with 1 on NVP (acupressure), 1 on low-back and pelvic pain, and 2 on depressive symptoms. Of the 3 RCTs on labor and

TABLE 1. DESCRIPTIVE DATA FOR 93 STUDIES PUBLISHED FROM 1998 TO 2012 BY COUNTRY AND CATEGORY

Study region, type & outcome	Treatment category		Pregnancy concerns	Postpartum concerns	Fetal blood supply
	Breech correction	L & D process			
Australia & NZ (n, %)	—	2 (33.3)	4 (66.7)	—	—
RCT (n)	—	1	3 ⁺	—	—
Acu benefit (n, %)	—	0 (0)	3 (100)	—	—
Americas (excl. USA)	—	2 (33.3)	4 (66.7)	—	—
RCT (n)	—	2	4	—	—
Acu benefit (n, %)	—	2 (100)	4 (100)	—	—
Asia	—	5 (62.3)	3 (37.5)	—	—
RCT (n)	—	5	2	—	—
Acu benefit (n, %)	—	5 (100)	1 (50)	—	—
China ^a	1 (4.3)	13 (56.5)	2 (8.7)	7 (30.4)	—
RCT (n)	1	13	1	7	—
Acu benefit (n, %)	1 (100)	12 (92.3)	1 (100)	7 (100)	—
Egypt	—	—	—	1 (100)	—
RCT (n)	—	—	—	1	—
Acu benefit (n, %)	—	—	—	0 (0)	—
Study region, type, & outcome	Treatment category		Pregnancy concerns	Postpartum concerns	Fetal blood supply
	Breech correction	L & D process			
European region	7 (17.9)	12 (30.8)	15 (38.5)	4 (10.3)	1 (2.6)
RCT (n)	6 ^b	11	10 ^b	4	1
Acu benefit (n, %)	4 (66.7)	6 (54.5)	6 (60)	3 (75)	1 (100)
USA	1 (8.3)	3 (25)	8 (66.7)	—	—
RCT (n)	0	3	4	—	—
Acu benefit (n, %)	n/a	0 (0)	4 (100)	—	—

Category percentages calculated as proportion of each region's respective total.

Acu benefit is within-region frequency and percent of RCTs reporting measured benefit of acupuncture, compared to identified control group.

^aTwenty-one studies were accessed; two were counted twice because they addressed two categories.

^bRCTs on adverse events were excluded from total count.

L & D, labor and delivery; NZ, New Zealand; excl., excluding; USA, United States of America; RCT, randomized controlled trial; Acu, acupuncture; n/a, not applicable.

delivery processes, 2 were on labor initiation and 1 was on treating nausea from surgical anesthesia; none of the 3 reported significant acupuncture-related benefit.

Time-related patterns in U.S. research. The first year of the U.S. publication in this time period was 2000, with the remaining publication dates relatively evenly distributed in subsequent years and following no apparent pattern, except that 3 studies were published in 2006.

Articles Retrieved and Exclusions: 1974–1998 (Period I)

To examine whether historical events (e.g., the ACOG's 1998¹⁵ publication on research in pregnancy) corresponded to any discernible publication pattern, the same Medline/PubMed database search performed for the post-1998 years was repeated for the 14 years prior. Of the 62 total studies initially identified for review, 26 involved direct data col-

lection from participants; the remaining were excluded from analyses because they involved treatment of infertility or related concerns (15 articles), were reviews or treatment descriptions (12 articles), or were not directly related to the topic (e.g., veterinary medicine). Of the 2 early 1998 *Medical Acupuncture* issues available for review, none of the 10 published articles addressed obstetric concerns.

In terms of region of origin and study topic, period I publication patterns were similar to the period II patterns already described. The top three regions contributing publications were the European Union (9 studies; 34.6% of total), China (8 articles, 30.8%), and the United States (4 articles, 15.4%). However, prior to December 1998, no publications were from Asian nations outside of China, and Russia contributed 4 articles (15.4%), compared to 0 in period II. Fewer period I (earlier) compared to period II (later) studies focused on breech correction (3.8% versus 9.5%) and on pregnancy processes (26.9% versus 37.9%); more period I studies focused on acupuncture for labor and

delivery processes (46.2% versus 39.0%) and on postpartum concerns (23.1% versus 12.6%).

Reports of Adverse Events in the 28-Year Review Period

Of the studies reviewed, 4 focused specifically on adverse acupuncture-related events, whereas the remaining studies either made no mention of adverse events or they directly referred to absence of adverse treatment effects.

The case study²¹ described in the Introduction featured a pregnant woman with respiratory complications attributed to acupuncture treatment for asthma 3 hours prior to hospital admission for treatment thereof. A 2008 study³⁴ focused on adverse events in 386 pregnant women randomized to one of four pelvic-pain treatments, including acupuncture. No adverse maternal or fetal medical events were reported, but the acupuncture group had the highest rate of minor maternal complaints; most related to mild pain at the site of needling. In a follow-up of adverse events resulting from acupuncture³⁵ in a randomized study of treatment for NVP in 593 women, no treatment-related differences were reported for maternal, perinatal, or neonatal outcomes. Assessment of fetal and maternal medical indicators and maternal views on treatment indicated no adverse events in 12 women treated with acupuncture for breech correction.³⁶

DISCUSSION

Over a 28-year period, the United States contribution to obstetric acupuncture research ranked third behind European nations and China (whose contribution was probably underestimated because of the databases' requirement of an English-language abstract). The proportion of RCTs to other study types originating from the United States appeared comparable to other global regions. With only 7 RCTs on which to base conclusions, the current authors reserve judgment on whether the pattern of acupuncture treatment outcomes differed between the United States and the rest of the world. The current authors can say, however, that, of the 12 U.S. studies conducted within the past 14 years, the 3 randomized studies addressing labor and delivery processes (labor initiation, procedural pain) indicated no significant acupuncture benefit, whereas the 4 articles on pregnancy concerns—including NVP, pregnancy pain, and depressive symptoms—did report significant benefit.

The current finding of fewer obstetric acupuncture studies originating from the United States than from China came as expected, given China's considerably more extensive history of acupuncture treatment. What might not have been anticipated was that the United States contributed fewer than one-third the number of studies as the European region, with the United States' 12 studies being only 1 more than Sweden. To put the U.S.–Swedish comparison in context, as of 2005, the

United States had >35 times the population of childbearing-age women (ages 15–40) than did Sweden.³⁷ As a global leader in medical research and the nation with the world's greatest health care expenditures, one may have anticipated a more substantial U.S. research contribution in this area.

A likely factor in the United States' third-place contribution and already mentioned in the Introduction is professional concern over treatment-related litigation. Also suggestive of litigation-related concerns was the finding that, compared to other regions, few U.S. studies were conducted in early pregnancy, when miscarriage risk is highest; moreover, the 3 early pregnancy studies involved acupressure as opposed to needling, aligning with a published statement discouraging needling in pregnancy.²⁶ However, the current authors consider the following point preliminary based on the small number of studies available: 12/13 (92%) non-U.S. acupuncture studies on NVP began in the first trimester, when NVP symptoms typically first present,³⁸ compared to 2 of 3 (67%) U.S. studies. For conditions such as low-back pain that might be most pronounced in later pregnancy, reserving treatment until advanced gestation would seem appropriate. However, the basis for treating NVP and even mood symptoms (in the 3 U.S.-based studies of acupuncture for depressive symptoms) after the first trimester were not addressed by study authors. In addition, acupressure rather than needling, was used in both first-trimester (100%) U.S.-based studies on NVP, compared to 5 of 13 (38.5%) non-U.S. studies.

Contemporary practicing obstetricians (not acupuncturists) have cited “fear of litigation” as among their primary reasons for altering practice patterns^{39,40} consistent with Forrester's²⁵ view that litigation concerns may trump evidence in professional views on acupuncture in pregnancy. With neither data on professional attitudes toward obstetric acupuncture nor reports of actual related litigation, the current authors can only state here that, despite only 1 case study²¹ reporting a serious adverse obstetric-acupuncture treatment-related event in nearly 3 decades of publications, the U.S. contribution to this research field is disproportionately low relative to its childbearing population. In addition, several studies on treating symptoms that typically emerge in early pregnancy appear to have reserved or delayed treatment until 14+ weeks, for reasons that were not fully explained. Studies that did involve treating women in the first trimester tended to use acupressure alone.

If, in fact, the U.S. obstetric acupuncture publication rate corresponds to liability concerns, it is somewhat ironic that a relatively greater number of U.S. acupuncture studies focus on pregnancy symptoms, compared to other global regions: 67% versus 38%, respectively. However, the relative emphasis on treating pregnancy symptoms with acupuncture, a no- to minimal-risk treatment, may reflect an interest in avoiding liability associated with potentially higher-risk treatments such as medications. Potential risk may be reduced even further by reserving treatment until the later stages of

pregnancy. If the current authors' speculation is correct, then important treatment research may go undone, particularly for early pregnancy onset conditions such as NVP.

Although real or imagined litigation fears may partly influence U.S. obstetric acupuncture research activity and focus, the current authors suspect that other nations' relatively more-impressive research productivity corresponds to better integration of conventional and complementary care. For example, a 2007 publication outlines an effective Swedish national model of nonhierarchical integration of conventional and complementary therapies into routine care.⁴¹ Similarly, a Swedish maternity hospital survey indicated that most practicing midwives had received formal, though perhaps minimal, acupuncture training, and that they integrated procedures in up to 16% of births.⁴² No comparable survey of obstetric acupuncture within U.S. hospitals was found, but the current authors would guess that such practice is virtually unheard of in conventional U.S. hospital culture.

Further evidence of how conventional and complementary care integration probably influences research progress comes from discrepancies between the U.S. and other global regions' contributions to specific obstetric treatment categories. Proportionally speaking, since 1998, labor and delivery process studies have been the focus of only 3 (25%) of the total 12 U.S. studies, compared to an average of 36% across other regions. In addition, 50% of global labor and delivery studies focused on labor analgesia, but the United States had no studies in that area. The difference probably relates to routine integration of complementary obstetric treatments into hospital births outside the United States, whereas hospital births in the United States routinely involve epidural analgesia.²⁵ In a birth culture where integrating complementary and alternative care into the conventional treatment paradigm is far from systematic and where conventional anesthetic procedures are normative, adopting new treatments probably presents psychological and practical challenges to researchers and patients alike.

Another challenge to obstetric acupuncture research within the United States is its private health care system structure, in which research on any treatment has to be funded either from treatment costs borne by patients or with research funds. Funding research relies not only on a researcher's motivation and success, but also on funding availability. At the time of writing this article, the United States' federal research agency supporting acupuncture studies, the National Center for Complementary and Alternative Medicine, had no obstetric indications listed among its funding priorities or active funding announcements (the priorities do change).

It should also be said that, while various factors may have slowed U.S. obstetric research activity, the U.S. contribution has grown at the same rate as the rate of rest of the world: Consistent with most other global regions, the raw number of obstetric acupuncture publications fitting the defined criteria for this review tripled from the 14 years preceding 1998 to the subsequent 14 years. Although it is

possible that ACOG's 1998 statement encouraging research in pregnancy triggered a publication increase, the increase probably also reflects new publication venues and growth in population and professional services. In addition—and worth tracking in future years—publications may grow in response to evidence of treatment benefit; based on the current authors' general review, readers can expect to see additional studies on acupuncture for breech correction, pain in pregnancy, and postpartum concerns.

Finally, it is vital to distinguish between *treatment* and *treatment research*. With growing acupuncture treatment and expenditures in the United States, obstetric acupuncture is likely to increase as well, with or without a reliable evidence base. Although the existing practice and patient communities can certainly be accessed for research—the current authors have studies underway—the work requires addressing formidable challenges including research leadership, funding, and the ability to implement research controls. Obstetric acupuncture research progress will necessarily depend on support from and collaboration with the conventional care community, where expertise, funding mechanisms, and practical supports already exist. Until those collaborations are strengthened, as they appear to be elsewhere, large-scale obstetric acupuncture studies will remain difficult to execute. More importantly, women may miss a potentially beneficial treatment for addressing pregnancy and childbirth concerns.

CONCLUSIONS

Understanding the state of obstetric acupuncture research is essential to its advancement. The United States has produced a steady stream of obstetric acupuncture studies in past decades, but the United States' overall contribution lags behind less-populated nations. Compared to other nations, U.S. studies are also more limited in scope, focusing largely on pregnancy rather than labor and delivery and postpartum concerns. What is likely to be influencing the U.S. contributions are professional liability concerns, the U.S. health care structure, and U.S. research funding. Collaboration among conventional and complementary medical treatment communities is key to investigating effectively this promising, low-cost treatment for pregnant and postpartum women.

ACKNOWLEDGMENTS

The authors wish to thank the WSU Vancouver Office of Research for funding part of this research.

DISCLOSURE STATEMENT

No competing financial interests exist.

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