

Hypnosis for Childbirth: A Retrospective Comparative Analysis of Outcomes in One Obstetrician's Practice

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Abstract

This exploratory, descriptive study, done retrospectively from perinatal medical records, compared childbirth outcomes in one obstetrician's caseload between 50 women who elected antepartal hypnosis preparation (usually a 5-class series) and 51 who did not. The groups were demographically similar. To achieve similar numbers to the hypnosis group, the control group was randomly selected from the women in the caseload who opted not to take hypnosis preparation, based on characteristics of parity and delivery mode. Prenatal hypnosis preparation resulted in significantly less use of sedatives, analgesia, and regional anesthesia during labor and in higher 1-minute neonatal Apgar scores. Other physiologic and outcome measures did not reveal statistical significance, although some trends were of clinical interest. Well-controlled studies are warranted for clinicians to offer hypnosis more frequently as a pain relief option for childbirth. Additional information provided includes pragmatic, clinical, and cost information about incorporating hypnosis into a physician's practice.

Key words: Hypnosis, childbirth, labor, pain, obstetric, analgesia, anesthesia

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Although hypnosis is a complementary, nonpharmacologic method used for pain and anxiety relief associated with multiple conditions, it is used infrequently. It has been estimated that less than 2% of the United States population uses hypnosis in some manner (Tindle, Davis, Phillips, & Eisenberg, 2005; Graham et al., 2005; Upchurch & Chyu, 2005; Tindle et al., 2005). Yet hypnosis has an established record of diminishing childbirth pain by managing anxiety and discomfort through inducing a focused state (Gentz, 2001; Ketterhagen, VandeVusse, & Berner, 2002; Simkin & Bolding, 2004). Decades ago, Kroger (1977) noted that hypnosis had already been used successfully to assist women during childbirth for over a century. Obstetrician and educator, Joseph DeLee (1940), in his now classic work, described hypnosis as the safest method of pain relief for labor, due to its lack of associated side effects.

Until recently, the literature about hypnosis for childbirth consisted predominantly of case study reports (Eslinger, 2000; Ketterhagen et al., 2002; Nickelson, Brende, & Gonzalez, 1999; Cyna, 2003; Oster, 1994; Sauer & Oster, 1997) or anecdotal, informational, or opinion-based articles (Breuer, 2000; Clark, 1999; McCarthy, 1998). Few outcomes of the use of hypnosis in childbirth had been consistently or scientifically measured.

Review of the Literature

The findings of a recent systematic review (Cyna, McAuliffe, & Andrew, 2004) and a randomized controlled trial (Mehl-Madrona, 2004) demonstrated significantly improved outcomes among women who used hypnosis for childbirth and their newborns. These include enhanced pain relief, diminished need for labor interventions, and improved newborn outcomes.

Pain Relief

Significantly less pain medication was needed by women who used hypnosis, according to a meta-analysis by Cyna and colleagues (2004). Using a random effects model, an effect size of 2.13, relative risk of 0.51 with 95% confidence interval [0.28-0.95], was determined, based on 3 of the 4 randomized clinical trials (RCTs) that met inclusion criteria. Significantly more hypnosis-prepared women avoided analgesia use during labor in a non-randomized comparison study (Jenkins & Pritchard, 1993). In another prospective non-randomized study (Guthrie, Taylor, & Defriend, 1984), hypnosis-prepared women reported significantly lower pain ratings (6.3 compared to 9.2) on a linear analogue scale. In the most recent RCT (Mehl-Madrona, 2004), the hypnosis prepared group had significantly lower use of any analgesia or epidural anesthesia.

Fewer Interventions

A second meta-analysis conducted by Cyna and colleagues (2004) using a random effects model demonstrated significantly less need for medication, such as pitocin, to stimulate contractions, resulting in more spontaneous labors among the hypnosis-prepared women. This effect size of 4.45, relative risk of 0.31 with 95% confidence interval [0.18-0.52] was based on 2 of the 4 included RCTs. In the RCT by Mehl-Madrona (2004), the hypnosis prepared group had significantly fewer complications, with less use of pitocin and cesarean deliveries when compared to women who received supportive psychotherapy.

Healthier Newborns

Although reported less often, some beneficial effects of maternal hypnosis preparation on newborn well-being are documented in the literature. One RCT (Harmon,

Hynan, & Tyre, 1990) found significantly higher newborn Apgar scores among the women who had hypnosis preparation. Another RCT (Martin, Schauble, Rai, & Curry, 2001) reported fewer admissions to neonatal intensive care when the mothers were prepared in the use of hypnosis for labor and delivery.

Need for Further Study

Mehl-Madrona (2004) concluded that “the routine prenatal use of hypnosis could improve obstetric outcome” (p. 299). Cyna and colleagues (2004) indicated that “outcomes are consistently in favor of hypnosis” (p. 510). They speculated that hypnosis could be considered an effective alternative to epidural anesthesia because the former is less invasive, not associated with serious complications, and may be more satisfying to women. In spite of these positive findings about the beneficial effects of hypnosis for childbirth, it remains a little used approach. In fact, during the past 4 decades the cumulative number of women who have used hypnosis in the prospective studies that were reviewed and considered of sufficient scientific quality for inclusion totaled less than 650 subjects (Rock, Shipley, & Campbell, 1969; Guthrie et al., 1984; Freeman, Macaulay, Eve, Chamberlain, & Bhat, 1986; Harmon et al., 1990; Jenkins & Pritchard, 1993; Martin et al., 2001; Mehl-Madrona, 2004; Cyna et al., 2004). Additionally, cost comparisons, as well as systematic studies by clinicians who have introduced applications of hypnosis into their own obstetric practices, have yet to be published.

The purpose of this study was to explore the outcomes of hypnosis in one obstetrician’s caseload. This exploratory, descriptive study was done retrospectively from perinatal medical records and compared childbirth outcomes to investigate the physician’s clinical impression that the women in the caseload who opted for hypnosis preparation used less pharmacologic pain relief. Other clinical variables of interest noted in previously published studies were also examined to identify possible trends in outcomes. Pragmatic, clinical information about incorporating hypnosis into a physician’s practice, as well as costs, are described. The study was approved by the Marquette University Institutional Review Board as well as that of the health care system where the study took place.

Materials and Methods

The obstetrician whose caseload was studied had been offering prenatal hypnosis preparation to all of her clients for two years prior to the start of data collection. The medical records of 180 women who gave birth within a 20-month time period (from May 2002 through December 2003) in this obstetrician’s practice formed the study sample. All gave birth at a large tertiary medical center located in a Midwestern city. Fifty women (24 primiparas and 26 multiparas) chose hypnosis preparation during the stated time and met the inclusion criteria (medically and obstetrically low risk). The non-hypnosis sample was randomly selected from the obstetrician’s remaining caseload, prior to examining the chart for any outcomes. The final non-hypnosis portion of the sample was purposefully chosen based on parity and mode of delivery in order to mirror the hypnosis sample on these attributes. Therefore, 51 non-hypnosis subject charts (27 primiparas and 24 multiparas) were selected for the comparison group.

The 101 childbirth medical records were reviewed by researchers not involved in the direct care of the patients for multiple variables pertaining to intrapartum care, analgesia and anesthesia use, and newborn status. Duplicate data collection was done on 22% of the medical records, in alternating pairs of the 3 coders, to ensure that data was being accurately located and

documented on the collection tool. A 95.7% inter-rater reliability was achieved when collecting data points from all variables coded (e.g., medications used and other labor data recorded in the medical records).

The prenatal self-hypnosis training that the 50 women received was accomplished in 5 individual sessions for 30 women (60% of the hypnosis group) or a 5-session group course for the remaining 20 (40% of the group). Individual sessions were conducted by the obstetrician or a clinical social worker while the group sessions were accomplished by the physician working with either of two clinical social workers. All of them were pursuing or had achieved certification from the American Society for Clinical Hypnosis. All women received the same basic information about hypnosis, whether instructed individually or through the group format. The 5-sessions were designed to teach expectant couples the skills of self-hypnosis to be employed during labor and childbirth. The objectives were to progressively expand the couples' awareness of techniques while learning to use self-hypnosis, as shown in Table 1. Women and couples were also instructed to practice the skills learned each week at home without the instructor and to then discuss their progress or concerns at subsequent sessions. The obstetrician attended all but two of the women's births in the sample. Therefore, she was available to most of the women during labor to make management decisions and provide coaching and other support.

Comparisons between the hypnosis and non-hypnosis groups were made on outcome measures (e.g., analgesia and anesthesia use) and various management strategies used, such as electronic fetal monitoring and artificial rupture of the membranes. The data were analyzed for probability values using Chi-squares and independent t-tests to examine for significant differences between groups. The statistical software package used was SPSS 13.0 (SPSS Inc., Chicago, IL). Data were also examined for trends that did not reach statistical significance but may have clinical significance.

Table 1: Summary of the Five Hypnosis Preparation Sessions

Session #	Information about Hypnosis	Application and Practice
1	Understand self-hypnosis and its various uses Learn about benefits Become aware of limitations Increase confidence about hypnosis	Experience trance through an induction by instructor Demonstrate ability to self-induce trance by practicing briefly with a specific framework 2-3 times
2	Increase awareness of trance phenomena (e.g., trance logic and appropriate language) Increase ability to change experience of sensations	Experience options for self-induction and deepening during practice Partner learns to induce mild pain stimuli
3	Expand awareness of sensory preferences (i.e., visualizations, feelings, sounds) by experiencing different images during trance Explore methods to communicate during labor	Learn to cope with common distractions by simulations with blood pressure cuff and fetal monitoring equipment Practice through interruptions
4	Use trance induction with labor metaphors (e.g., resting, time distortion) Encourage labor images relating to specific sensory preferences	Increase ability to use self-hypnosis Manage pain stimuli by placing ice on wrists to mimic contractions
5	Discuss using self-hypnosis for specific concerns associated with labor (e.g., vomiting, shaking) Increase awareness of other pain control modalities (e.g., transcutaneous electrical nerve stimulation unit and various medications)	Have each couple practice a trance "dress rehearsal" Practice is to include anticipation of each phase of labor

Results

The two groups were similar based on demographics. For example, there was a non-significant difference in their ages, with the hypnosis group mean of 32.2 years and the non-hypnosis group mean of 31.6, $t(99) = -.752, p = .454$. All women had low rates of obstetrical and medical risk by which they met the selection criteria. The women included in the study all had full-term pregnancies, with a mean gestational age of 39 weeks in both groups. The average number of children among the multiparous women was also similar (2.7 for the hypnosis-prepared and 2.5 for the non-hypnosis group). Chi-squares reported in Table 2 demonstrate other comparisons on nominal variables that indicated differences between the two groups were non-significant.

Table 2: Demographic Comparison (n = 101)

Characteristic	Hypnosis (n = 50)	Non-Hypnosis (n=51)	χ^2	<i>df</i>	<i>P</i> All <i>ns</i>
Married ^a	48 (96)	46 (90)	1.318	1	.251
Race					
White	48 (96)	44 (86)	5.965	4	.202
African American	0 (0)	2 (4)			
Hispanic	0 (0)	1 (2)			
Asian	1 (2)	4 (8)			
Mixed	1 (2)	0 (0)			
Religion [grouped] ^b			5.12	2	.774
Christian	36 (72)	36 (70)			
None	10 (20)	12 (24)			
Other (non-Christian)	2 (4)	3 (6)			
Feeding choice for infant ^c			4.002	4	.406
Breast [predominantly]	44 (88)	44 (86)			
Bottle	5 (10)	5 (10)			

Note: Values are expressed as n (%) unless indicated otherwise

χ^2 = Pearson chi-square. *df* = degree of freedom. *P* = probability. *ns* = nonsignificant

^a Missing data: 2 in the hypnosis group and 5 in the non-hypnosis group.

^b Missing data: 2 in the hypnosis group.

^c Missing data: 1 in the hypnosis group and 2 in the non-hypnosis group.

Medications used by women during labor were examined from various perspectives, including numbers of doses, types, and timing of medications. The types of labor medications used and the number of doses received generally showed different trends between the groups. The medications were categorized and numbers of doses were recorded, with the total doses compared statistically. More non-hypnosis prepared women received doses of sedatives before active labor [primarily zolpidem], with 12 doses to non-hypnosis-prepared women compared to one dose given to a woman in the hypnosis group. Analgesics given during labor were categorized by type as short-acting (fentanyl) or long-acting (nalbuphine hydrochloride). More women who were hypnosis-prepared received doses of the shorter-acting analgesics (73 doses compared to 51 in the non-hypnosis group). However, hypnosis prepared women received only 4 doses of long-acting analgesia compared to 32 doses used by the women in the non-hypnosis group. Overall, the number of doses of analgesics and sedatives given to women totaled 78 in the hypnosis group and 95 to the non-hypnosis prepared. A Pearson chi-square indicated that comparison of doses was significantly different between the two groups, $\chi^2(3, N = 173) = 51.989, p < .0001$. All women who experienced cesarean section births in both groups had some type of regional anesthesia. Among the women who had vaginal births, 5 (10%) of the hypnosis prepared and 23 (45%) of those not using hypnosis had epidural anesthesia. A Pearson chi-square indicated that the relationship between no hypnosis preparation and epidural use was significant, $\chi^2(1, N = 28) = 20.098, p < .001$.

There were no significant differences found in most of the other maternal outcome measures: vital signs, spontaneous or artificial rupture of membranes, external electronic fetal monitoring, labor stimulation for induction or augmentation, episiotomy, length of labor, or estimated blood loss. Although the hypnosis prepared women who delivered vaginally experienced an average 2.2 hour shorter labor length than the comparable women without hypnosis preparation, the t-test done on this difference did not reach statistical significance. The one exception to the non-significant differences on labor management variables was the number of women in the two groups, although small, who received internal fetal monitoring. A Pearson chi-square examined the use of fetal scalp electrodes applied for internal fetal monitoring during labor between the groups and demonstrated that the difference between 6 women in the non-hypnosis group with fetal scalp leads compared to no women in the hypnosis group was significant, $\chi^2(2, N = 6) = 7.374, p = .025$.

Neonatal outcomes were also analyzed. Apgar scores are a commonly used outcome measure (rated on a scale of 0 to 10) because they provide an indication of a neonate's stability during the transition period from intrauterine life to existing on one's own or a possible need for resuscitation if the scores go lower. The Apgar scores in this study were generally assigned by registered nurses at the birth unless there was an operative delivery, in which case the determinations were made by neonatologists in attendance. Apgar scores at 1-minute were significantly higher for neonates of the hypnosis-prepared mothers, who had a mean of 8.1, compared to those from the non-hypnosis-prepared group with a mean score of 7.3, $F(99, N = 101) = 13.692, p = .015$. According to the Pearson chi-square, this statistical significance held true for the number of babies who had 1-minute Apgar scores less than 7 in each group, of which there were 2 (4%) in the hypnosis group and 11 (22%) among the non-hypnosis-prepared, $\chi^2(1, N = 13) = 6.949, p = .008$. There were no significant differences between groups on 5-minute neonatal Apgar scores. Umbilical cord pH is another neonatal outcome indicator, obtained immediately after the birth, that measures the acidity of the baby's blood. This test can be used to indirectly indicate an infant's distress in utero and possible need for resuscitative support. Umbilical cord pH values were not obtained routinely

in this sample, nor at most births in the institution. Of the 11 (22%) of the infants from the hypnosis group and the 20 (39%) of the non-hypnosis-prepared group's newborns who had umbilical cord pHs done, the mean newborn umbilical cord pH values were 7.29 and 7.24 respectively, a non-significant difference. There was also no statistically significant difference between the hypnosis and non-hypnosis groups in mean birth weight, averaging 3450 to 3550 grams respectively.

Discussion

This study demonstrated the feasibility and outcomes of obstetric hypnosis based on analysis of one physician's practice. Significantly fewer women with hypnosis preparation used labor analgesia and epidural anesthesia. This finding was similar to that of other studies of the use of hypnosis for childbirth (Mehl-Madrona, 2004; Harmon et al., 1990; Rock et al. 1969; Martin et al., 2001; Cyna et al., 2004; Jenkins & Pritchard, 1993). The application of hypnosis in obstetric practice requires significant commitment on the part of the physician and staff, but has potential benefits for mothers and infants.

A major challenge to offering hypnosis as an option to women for their care is insufficient clinician understanding about the efficacy (Coldrey & Cyna, 2004). For example, a majority (84%) of over 300 Denver-area physicians, responding to a mailed survey about complementary and alternative therapies, expressed the need to learn more about them to facilitate patient care (Winslow & Shapiro, 2002). Overall, about 20% of these physicians reported having clients who inquired about and used hypnosis. One of the reasons for women infrequently choosing to use hypnosis for childbirth may be the difficulty they encounter finding practitioners who are prepared to teach, guide, and support them in the use of hypnosis. Thus, additional professional preparation to provide hypnosis, including pursuing certification through an organization like the American Society of Clinical Hypnosis, is recommended. Opportunities to expose student learners to hypnosis while they are forming their attitudes about practice could also be sought by educators in disciplines that provide pregnancy and birth services. With familiarity, graduates may be more likely to incorporate hypnosis into their practices.

Hypnosis for childbirth has potential cost savings. For example, in this physician's practice, the average cost of the series of five hypnosis preparation classes was \$200 per couple. Some clients paid out of pocket, while others' insurance companies reimbursed this cost as 'anxiety management'. Compared to the average charges per delivery related to epidural anesthesia, which are estimated to range in the thousands of dollars due to anesthesiologists' time, supplies, additional intravenous fluids, and monitoring equipment, self-hypnosis represents a significant cost advantage. Estimates are that 60% of American women currently experience labor and birth with epidural anesthesia. Hypnosis presents a cost-effective alternative for the remaining 40% of women who chose to experience labor unanaesthetized. More study is needed of the exact costs and comparisons when women choose childbirth hypnosis.

The obstetrician who taught the hypnosis sessions also attended most of the sample's births. This was important in that it allowed her to sustain a supportive environment for the women to use hypnosis, provide coaching, make management decisions and minimize interruptions or distractions during labor. Because she also made the intrapartum management decisions, this had the potential to bias the use and choice of analgesia as well as labor interventions. However, the care provided was similar on these indicators and did

not show significant differences between the groups, indicating the women in both groups received consistent treatment from the obstetrician.

The trend toward shorter length of labor by an average of 2 hours for the hypnosis-prepared seen in this study may be desirable to women and practitioners. Shortened labor length with hypnosis has been documented in other studies (Cyna et al., 2004; Harmon et al., 1990) and warrants further study. Similarly, the trend toward decreased estimated blood loss in the women using hypnosis may also have clinical significance and requires additional research with larger samples.

Neonatal outcomes in the hypnosis group were significantly improved. Although the average Apgar scores were within the normal range (> 7), the difference in means between the two groups at 1-minute was statistically significant. The differences in average Apgar scores between the hypnosis group (8.1) and the non-hypnosis group (7.3) is clinically significant for immediate care of the neonate. This difference resolved by the five-minute Apgar score and therefore suggests no sustained differences. Cord blood pH tests were done for 31 infants of the total 101. This testing was done selectively by the physician if there was a concern about fetal status. A larger number of cord pHs drawn in the non-hypnosis group could possibly indicate that the physician was more concerned about these fetuses, but further examination of this in future work is indicated. The relationship of hypnosis preparation for childbirth and potentially positive neonatal outcomes would benefit from further study.

There were several limitations to this study. A primary limitation was the retrospective data collection method. The medical chart entries were made by many hospital staff and the method of recording had not been standardized for the purpose of the study. Additionally, no measure assessing the hypnotizability of the women was employed, so the participants' ability to utilize the self-hypnosis skills learned was essentially unknown. In addition, nursing documentation about women's use of self-hypnosis techniques during labor was sporadic and limited, making conclusions about its application difficult. Similarly, over time, modifications were made in the self-hypnosis curriculum resulting in variations in the content, so the instruction for the 50 women who elected hypnosis preparation was not completely standardized. Additionally, participants were homogenous, over 90% were white and married; this is non-representative of childbearing women in the general population, limiting generalizability. Furthermore, the women who chose to learn hypnosis were self-selected. The women who elected instruction in hypnosis most likely did so based on a desire to utilize fewer medications during labor and childbirth. Conversely, women who were planning to have an epidural during childbirth may not have been motivated to learn hypnosis. As such, differences in epidural rates and pain medication use would be expected based on the participants' intentions. Finally, the sample size was relatively small, with only limited random selection possible within the non-hypnosis group.

The physician made a point to offer hypnosis preparation, for its perioperative benefits, to all women having planned cesareans. Seventeen of the 50 hypnosis-prepared women had surgical births. Therefore an equivalent number (18 of the 51) were randomly selected from the non-hypnosis group ($p = .943$). Although this made the cesarean rate of the entire sample appear falsely high (34%), it facilitated comparisons.

Prospective studies of obstetric outcomes, using standardized hypnosis techniques, are warranted (Cyna et al., 2004). It would be helpful for pregnant women and clinicians to have results from well controlled studies on childbirth applications of hypnosis, including hypnotizability (Lynn, Kirsch, Barabasz, Cardena, & Patterson, 2000) and decision-making

about pain management. It is recommended that researchers in obstetric hypnosis consistently measure other outcomes that have demonstrated improvements during prospective perioperative uses of hypnosis. These include decreased operative time for minor procedures, less use of sedation during operations, less use of analgesia post-operatively, and increased satisfaction (Montgomery, David, Winkel, Silverstein, & Bovbjerg, 2002; Defechereux et al., 1999; Faymonville et al., 1997; Montgomery, Wetz, Seltz, & Bovbjerg, 2002). Lang & Rosen (2002) have shown cost savings based on these benefits identified from perioperative hypnosis and Sobel (2000) has asserted that complementary strategies are cost-effective. However, all aspects of hypnosis research need more well-controlled, systematic investigation with adequate sample sizes to further demonstrate value for childbirth and other applications (Cyna et al., 2004; Hawkins, 2001; Chaves & Dworkin, 1997; Cyna, Andrew, & McAuliffe, 2005).

Although careful study is needed, hypnosis for childbirth was associated with positive outcomes in this study of women who gave birth in one obstetrician's practice. As the outcomes of this and other studies have suggested, hypnosis is a viable option for women that would allow for a lower technology approach to pain management with minimal to no risk. This may appeal to providers and their clients (Huntley, Coon, & Ernst, 2004; Coldrey & Cyna, 2004). However, clinicians need more opportunities to learn about hypnosis as an efficacious therapy (Coldrey & Cyna, 2004; Winslow & Shapiro, 2002).

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