

CLINICAL INVESTIGATIONS

Hypnosis for pain relief in labour and childbirth: a systematic review

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**Background.** In view of widespread claims of efficacy, we examined the evidence regarding the effects of hypnosis for pain relief during childbirth.

**Methods.** Medline, Embase, Pubmed, and the Cochrane library 2004. I were searched for clinical trials where hypnosis during pregnancy and childbirth was compared with a non-hypnosis intervention, no treatment or placebo. Reference lists from retrieved papers and hypnotherapy texts were also examined. There were no language restrictions. Our primary outcome measures were labour analgesia requirements (no analgesia, opiate, or epidural use), and pain scores in labour. Suitable comparative studies were included for further assessment according to predefined criteria. Meta-analyses were performed of the included randomized controlled trials (RCTs), assessed as being of 'good' or 'adequate' quality by a predefined score.

**Results.** Five RCTs and 14 non-randomized comparisons (NRCs) studying 8395 women were identified where hypnosis was used for labour analgesia. Four RCTs including 224 patients examined the primary outcomes of interest. One RCT rated poor on quality assessment. Meta-analyses of the three remaining RCTs showed that, compared with controls, fewer parturients having hypnosis required analgesia, relative risk=0.51 (95% confidence interval 0.28, 0.95). Of the two included NRCs, one showed that women using hypnosis rated their labour pain less severe than controls ( $P<0.01$ ). The other showed that hypnosis reduced opioid (meperidine) requirements ( $P<0.001$ ), and increased the incidence of not requiring pharmacological analgesia in labour ( $P<0.001$ ).

**Conclusion.** The risk/benefit profile of hypnosis demonstrates a need for well-designed trials to confirm the effects of hypnosis in childbirth.

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The use of hypnotherapy in pregnancy and childbirth has been practised for more than a century,<sup>1</sup> and is said to be one of the most useful and rewarding applications of hypnosis.<sup>2</sup> However, a concise definition that accurately reflects the hypnotic experience remains elusive. Hypnosis appears to encompass altered states of consciousness, such as daydreaming, meditation, or intense concentration, resulting in the failure of normally perceived experiences reaching conscious awareness. Such hypnotic or 'trance' states are characterized by an increased receptivity to verbal and non-verbal communications, which are commonly referred to as suggestions.<sup>3</sup> Hypnotherapy can be defined as the clinical use of suggestions during hypnosis to achieve specific therapeutic goals such as the alleviation of pain or anxiety.

The anterior cingulate gyrus has been demonstrated, by positron emission tomography, to be one of the sites in the brain affected by hypnotic modulation of pain.<sup>4</sup> This suppression of neural activity, between the sensory cortex and the amygdala—limbic system, appears to inhibit the emotional interpretation of sensations such as pain. The effectiveness of hypnotic analgesia in the perioperative setting has been demonstrated previously.<sup>5</sup> A number of reports have now shown hypnosis to be of value in decreasing: (i) operating times for minor radiological procedures;<sup>6</sup> (ii) the use of intraoperative sedation; and (iii) analgesia requirements post-operatively.<sup>5–7</sup>

Psychological interventions such as continuous support during labour are associated with a reduced requirement

for intrapartum analgesia, a lower incidence of operative birth, and reduced reports of dissatisfaction with childbirth experiences.<sup>8</sup> Read's celebrated publication entitled 'Childbirth without Fear' suggested that eliminating fear, apprehension and tension can reduce or eliminate pain.<sup>9</sup> Interestingly, both Read and Lamaze use relaxation, reassurance, positive suggestions, and ego-strengthening techniques, which are also utilized during hypnosis.<sup>10</sup> Labour has been described as one of the most intense forms of pain that can be experienced,<sup>11</sup> and represents both a physiological and psychological challenge for women.<sup>12</sup> Epidural analgesia is the most effective method of providing pain relief in labour when compared with non-epidural methods,<sup>13</sup> and regional techniques are generally accepted to be the gold standard methods of pain relief in such circumstances. These techniques are in widespread use despite their known side effects, as they are perceived to have a good risk/benefit profile in the absence of effective alternatives. However, the complete removal of labour pain by epidural analgesia does not necessarily mean a more satisfying birth experience for women,<sup>14</sup> and is associated with serious complications.<sup>15 16</sup> Any less invasive but effective technique that could be used as an analgesia adjunct would be of great interest to the obstetric population. Hypnosis has been utilized effectively where epidural analgesia is contra-indicated,<sup>17</sup> and is claimed to block all subjective perceptions of pain during labour in up to 25% of parturients.<sup>18</sup> A case has been reported where hypnosis was the sole anaesthetic technique used during Caesarean section with hysterectomy.<sup>19</sup> The responsiveness of women to hypnosis appears to be increased in pregnancy.<sup>20</sup> In view of widespread claims of efficacy, we aimed to review the available evidence regarding the effects of hypnosis, when used for pain relief, during labour and childbirth.

## Methods

### Searching

We searched for all relevant trials where hypnosis was compared with a non-hypnosis intervention, no treatment or alternative suggestions at any time during pregnancy and childbirth. There were no language restrictions. The electronic databases Medline, Pubmed (1966 to March 2004), Embase to December 2003, and the Cochrane library (The Cochrane Library Issue 1, 2004) were searched. We used a combination of subject headings (hypnosis and pregnancy), and text words [(autogenic or hypn\* or suggestion) AND (pregnancy or childbirth or labour or labor or delivery)]. References from retrieved papers and bibliographies of relevant texts on hypnosis were also examined.

### Selection

We excluded case reports, case series without a comparison group, studies that did not explicitly state that they were investigating the use of hypnosis or suggestions, and those

studies where pain relief was not an outcome. We included all comparative trials in which at least one treatment was hypnosis or the use of suggestion, and at least one outcome was a pain measure or analgesia requirements.

### Validity assessment

A standardized data extraction sheet was used to transcribe data from the original studies. We assessed the quality of randomized controlled trials (RCTs) using quality score assessments as performed by Kleijnen.<sup>21</sup> Trials scoring 8.0–10.0 were rated as very good, 7.0–7.9 good, 5.0–6.9 acceptable, and less than 5.0 poor. Only randomized trials scoring 5.0 or higher were included in the meta-analysis. To determine internal validity we documented the method of randomization, concealment, comparability of groups at baseline, masking, completeness of follow-up, and intention to treat analysis. Trials were also assessed for external validity with particular reference to the reproducibility of the hypnotic technique. Non-randomized comparisons (NRCs) were included for review if they were prospective studies with matched controls, had less than 30% losses to follow-up, and had reported the outcomes of interest. We planned to separately report the results of NRCs including RCTs that failed to fulfil the criteria for meta-analysis.

### Data abstraction

Independent data abstraction was performed on a data collection form, cross-checked by two assessors (A.M.C., G.M.). Data suitable for meta-analyses was transcribed to the Review Manager Computer program (Revman 4.2) of the Cochrane Collaboration by A.M.C., and subsequently checked by one of the other authors.

### Study characteristics

Study design, types of study participants, details of the intervention, and hypnotist are detailed in the results. Study heterogeneity was assessed qualitatively and by statistical analysis within Revman.

### Quantitative data synthesis

Dichotomous outcome data are presented as relative risk with 95% confidence intervals (CI) using a random effects model. Continuous data, if reported (means, SD), are presented as weighted mean difference (WMD). Included NRC and RCT data unsuitable for meta-analyses are presented as reported in the original paper.

## Results

### Trial flow

Five RCTs<sup>22–26</sup> and 14 NRCs<sup>10 27–39</sup> studying 8395 women were identified where hypnosis might have been used for

**Table 1** Randomized and case controlled studies included in review. H, hypnosis group; C, control group

First author, country	Numbers, H:C allocation, blinding	Outcomes claimed for hypnosis	Specific problems
Rock <sup>24</sup> 1969, US	22:18, ?randomized, ?double blind	Fewer patients used meperidine (62 vs 94%) $P<0.05$  Hypnosis patients rated by blinded observer as more uncomfortable before treatment $P<0.05$ , more comfortable shortly after treatment $P<0.001$ , and more comfortable late in labour $P<0.05$ Patients rated their experience as less painful $P<0.01$	Inadequate concealment of allocation (allocated by hospital number) although states randomized, double blind study
Freeman <sup>23</sup> 1986, UK	42:40, randomized, blinding not stated	Good/moderately susceptible hypnosis patients (4/24) had fewer epidurals than poorly susceptible (4/5) $P<0.01$ Longer labour in hypnosis group by 1.7 h $P<0.05$	No definition of onset of labour or suggestions given  Overall 31% H group and 10% C excluded from analysis; no details provided about discrepancy in group sizes Blinding unstated No details about suggestions made
Harmon <sup>25</sup> 1990, US	30:30 total, randomized, double blind	Improved ischaemic pain thresholds (i.e. pain tolerance) $P<0.001$  Less narcotics, tranquilizers and oxytocin, all $P<0.001$ Shorter 1st stage labour by 2.8 h in high susceptibility hypnosis group and by 2.2 h in low susceptibility group $P<0.001$ More spontaneous deliveries $P<0.05$ Improved APGAR scores $P<0.001$	Medication expressed as a 'percentage' but unclear figures with inadequate reporting of some outcomes
Martin <sup>26</sup> 2001, US	22:20 teenage primips, randomized, patients blinded	Shorter hospital stay $P<0.01$  Less surgical intervention (0 vs 60%) $P<0.0001$  Less 'complications' (55 vs 80%) $P<0.05$	10% loss to follow up  Complications included 36 different categories not specified individually Blinding of assessor not stated No definition of surgical intervention
Guthrie <sup>27</sup> 1984, UK	Case controlled prospective study. Eight subjects (one primip, seven multips) eight controls	Pain (assessed by linear analogue score) was less in the hypnosis group: median 6.3 compared with 9.2 in controls $P<0.01$	Small numbers but controls matched for age, social class, parity and length of labour
Jenkins <sup>28</sup> 1993, UK	Case controlled semi-prospective study. 126 primips, 136 multips, each group had 300 age-matched controls	More hypnosis patients used no analgesia (33/126 primiparous and 50/136 multiparous compared with 13/300 and 33/300 controls) $P<0.001$ . More hypnosis patients used no meperidine (66/126 primips and 80/136 multips compared with 49/300 and 99/300 controls) $P<0.001$ Decreased labour times in first $P<0.0001$ and second stage $P<0.001$ for primiparous women and in 1st stage for multiparous women $P<0.01$	High drop out rate of 33% from hypnotherapy patients initially recruited despite being volunteers  Well matched controls apart from unexpected finding that hypnosis group had heavier babies than controls

**Table 2** Reasons for trial exclusion

Reason	Trial (first author and reference)
Self selected and unmatched groups	August, <sup>29</sup> Brann, <sup>30</sup> Callan, <sup>31</sup> Davidson, <sup>32</sup> Flowers, <sup>36</sup> Gross, <sup>33</sup> Perchard, <sup>39</sup> Venn, <sup>10</sup> Williamson <sup>35</sup>
Inadequate data reporting	Michael, <sup>34</sup> Pascatto <sup>38</sup>
High loss to follow up	Moya <sup>37</sup>
Analgesia not an outcome	Hao <sup>22</sup>

analgesia during labour. Only four RCTs, including 224 women,<sup>23–26</sup> and two NRCs including 878 women,<sup>27,28</sup> examined the primary outcomes of interest. Separate research teams based in the USA and UK performed these studies

between 1969 and 2001. Tables 1 and 2 summarize the included and excluded trials identified from our search. Table 3 summarizes the quality scores for the included RCTs. Table 4 outlines the hypnotherapy methods utilized by the included trials. Three of the four included RCTs were of adequate quality for meta-analyses.<sup>24–26</sup> The RCT<sup>23</sup> excluded from meta-analyses was a result of its poor quality rating score of 3.5.

#### Primary outcome measures: use of analgesia and pain scores

The effect of hypnosis on analgesic (opioid) consumption in good/moderate quality RCTs is shown in Figure 1. None of

these trials reported that epidural analgesia was a pain relief option. The Freeman trial<sup>23</sup> failed to show any difference in epidural use between hypnosis and control groups (RR 0.85, 95% CI 0.36, 1.98). However, those patients rated to have a good or moderate response to hypnosis had relatively fewer epidurals than those rated poorly responsive 4/24 vs 4/5 ( $P<0.05$ ). The two NRCs included in this study show decreased median pain scores,<sup>27</sup> and decreased analgesia

requirements,<sup>28</sup> in those women receiving hypnosis compared with controls.

### Secondary outcomes

**Duration of labour.** Harmon found the duration of the first stage of labour in the hypnosis group to be significantly shorter ( $P<0.001$ ) than the control group by over 2 h. This was the only study that defined the duration of labour (as time from 5 cm to full dilatation).<sup>25</sup> Jenkins similarly described a significant reduction in duration of labour, in her case control series, of 2.9 h for primiparous and 0.9 h for multiparous women.<sup>28</sup> Freeman is the only report finding a significantly longer mean duration of labour by 1.7 h ( $P<0.05$ ) in those primiparae receiving antenatal hypnosis, although there was no definition of onset of labour.<sup>23</sup> Incomplete reporting of data for this outcome prevented further analysis.

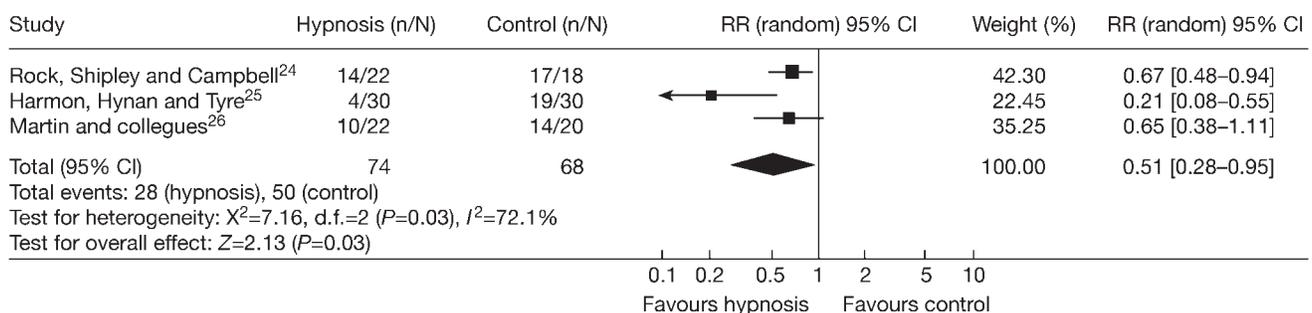
**Labour augmentation with oxytocic drugs.** Harman<sup>25</sup> describes a significant reduction in the use of labour augmentation by oxytocin in women utilizing hypnosis (RR 0.31 95% CI 0.18, 0.54). Figure 2 shows the meta-analyses of the good/adequate quality trials where this outcome is measured.<sup>25 26</sup> Fewer women using hypnosis required labour augmentation compared with controls (RR 0.31, 95% CI 0.18, 0.52), as reported in a recent systematic review.<sup>12</sup>

**Table 3** Methodological assessment and quality scores of randomized studies reviewed. A, well-described inclusion criteria; B, at least 50 patients per group; C, random allocation procedure described; D, presentation of relevant baseline characteristics; E, less than 10% drop outs and drop outs described; F, interventions well described (nature, number, duration of treatments); G, double blinding; H, effect of measurement relevant and well described; I, intention to treat analysis; J, presentation of results in such a manner that analysis can be checked; 1.0, yes; 0, no; 0.5, description was unclear or only some of several interventions, measurements or data met requirements

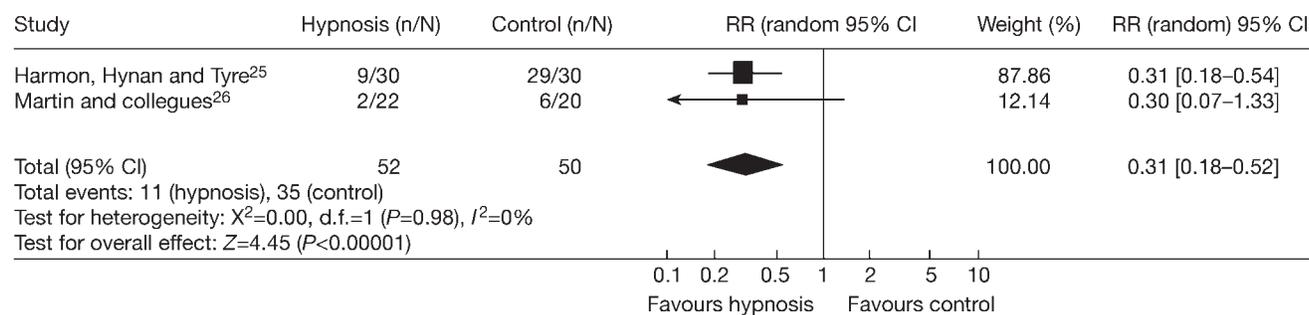
Study and quality	Quality scores										
	A	B	C	D	E	F	G	H	I	J	Total
Good											
Harmon <sup>25</sup>	1.0	0	0	1.0	1.0	1.0	1.0	1.0	0	1.0	7.0
Acceptable											
Rock <sup>24</sup>	1.0	0	1.0	1.0	1.0	1.0	1.0	0.5	0	0	6.5
Martin <sup>26</sup>	1.0	0	0	0	1.0	1.0	1.0	0.5	0	0.5	5.0
Poor											
Freeman <sup>23</sup>	1.0	0	0	0.5	0	0.5	0	1.0	0	0.5	3.5

**Table 4** Details of hypnotherapy in included studies

Study	Hypnotist	Methods
Rock <sup>24</sup> 1969	Medical student	Standard script used in labour for individual patients. Included relaxation, focused attention, self-hypnosis prompts and glove/abdominal anaesthesia
Freeman <sup>23</sup> 1986	Not stated (authors from Obstetrics/Psych)	Individual weekly sessions from 32 weeks gestation with suggestions for relaxation and analgesia. No details provided
Harmon <sup>25</sup> 1990	Harmon (psychologist) and a registered nurse	Groups of 15, six sessions in total. Live induction at first session with tape made for daily home practice. Suggestions for relaxation and analgesia. Recorded ischaemic pain thresholds pre- and post-sessions
Martin <sup>26</sup> 2001	Study counsellor ?Psychologist	Four individual sessions over 8-week period starting at 20–24 weeks gestation. No details of suggestions made provided
Guthrie <sup>27</sup> 1984	Obstetrician	Six to eight individual 30 min sessions after 30 weeks gestation. Suggestions for relaxation and analgesia. Taught autohypnosis and to have trance induced by husband
Jenkins <sup>28</sup> 1993	Medical hypnotherapist	Six individual half hour antenatal sessions. Included suggestions for auto-relaxation and auto-analgesia. Encouraged to practice self hypnosis



**Fig 1** Meta-analysis, using a random effects model, of RCTs rated 'good' or 'acceptable' for the outcome: 'use of pharmacological pain relief'. Data are presented as relative risk (RR) with 95% confidence intervals (95% CI).



**Fig 2** Meta-analysis, using a random effects model, of RCTs rated 'good' or 'acceptable' for the outcome: 'use of labour augmentation'. Data are presented as relative risk (RR) with 95% confidence intervals (95% CI).

*Mode of delivery.* Harmon found that there was an increased incidence of women delivering spontaneously with hypnosis (RR 1.67, 95% CI 1.13, 2.67). The two other moderate/good quality RCTs did not report this outcome.

## Discussion

This report represents the most comprehensive review of the literature to date on the use of hypnosis for analgesia during childbirth. The meta-analysis shows that hypnosis reduces analgesia requirements in labour. Apart from the analgesia and anaesthetic effects possible in receptive subjects, there are three other possible reasons why analgesic consumption during childbirth might be reduced when using hypnosis. First, teaching self-hypnosis facilitates patient autonomy and a sense of control. Secondly, the majority of parturients are likely to be able to use hypnosis for relaxation, thus reducing apprehension that in turn may reduce analgesic requirements. Finally, the possible reduction in the need for pharmacological augmentation of labour when hypnosis is used for childbirth, may minimize the incidence of uterine hyperstimulation and the need for epidural analgesia.

### Internal validity

Inadequate random allocation, concealment, or lack of blinding in RCTs may result in overestimations of effect. Hypnosis is a difficult intervention to allocate blindly, although this has been attempted in at least three RCTs.<sup>22 25 26</sup> Blinding raises questions of informed patient consent and double-blind hypnosis studies are unlikely to pass the rigours of an ethical committee assessment in today's research environment. A reasonable method of giving sham hypnosis has yet to be identified.

### External validity

With the exception of Freeman,<sup>23</sup> no trial to date has investigated whether epidural analgesia use is affected by hypnosis. The external validity of those studies suitable for meta-analysis is limited by the fact that many hospitals have an epidural on demand service.

### Potential bias

The potential for bias by missing potentially eligible trials has been minimized by having no language restrictions in our search. However, the small numbers of patients, the lack of power analyses, and statistically significant trial heterogeneity may all have contributed to bias the results of this study. All but one trial investigating the outcome 'use of analgesia' has been in favour of hypnosis.<sup>10</sup>

### Trial heterogeneity

The statistical heterogeneity found when performing meta-analyses of our primary outcome probably reflects different hypnosis techniques and timing of the intervention.

### Potential adverse effects of hypnosis

None of the reviewed trials report adverse effects attributed to the hypnosis intervention. There are two published reports of a hypnosis complication associated with an obstetric patient. One involved a parturient before labour exhibiting psychotic symptoms believing that she had been assaulted,<sup>1</sup> and the other involved a treatable postpartum anxiety and compulsive behaviour associated with the use of hypnosis during labour.<sup>40</sup> There appears to be little basis for the fears surrounding the supposed dangers of hypnosis in obstetrics, although such opinions may have been a deterrent to its application.<sup>1</sup>

### Clinical interest in hypnosis

A report of anaesthetists' attitudes towards hypnotherapy found that with improved knowledge of hypnotherapy, there was an increased likelihood that an anaesthetist would use such techniques.<sup>41</sup> A recent survey of South Australian anaesthetists showed that nearly half the respondents considered hypnotherapy to be of potential value in their clinical practice.<sup>42</sup> Fifty years ago, the BMA report on the use of hypnotism<sup>43</sup> recommended that hypnosis should be included in obstetric and anaesthetic postgraduate training. Although anaesthesia's links with hypnosis have been

recognized previously,<sup>44</sup> few anaesthetists have utilized the technique in their clinical practice. There seems to be renewed interest amongst anaesthetists in Europe<sup>7 45</sup> and the USA.<sup>46</sup>

### *Is it practical to teach and use?*

The trials reviewed demonstrated that a wide variety of personnel have used hypnosis effectively including medical students,<sup>24</sup> psychologists,<sup>25</sup> midwives,<sup>22</sup> obstetricians,<sup>29</sup> and general practitioners.<sup>31</sup> Most authors suggested that antenatal training can be achieved in as few as four to six sessions.<sup>25–28</sup> Rock showed that untrained mothers may benefit from hearing a medical student read a standardized hypnosis script for the first time in labour.<sup>24</sup> Hypnosis scripts in this context include suggestions designed to facilitate the induction of hypnosis and the relief of pain and anxiety during labour. It is interesting to note that, despite differences between trials in the timing and number of hypnosis interventions reported, outcomes are consistently in favour of hypnosis. The trial heterogeneity seen in Figure 1 can be explained if the various hypnosis interventions are considered equivalent to differences in the timing and dosage of drug administrations that achieve a varying response in the direction of the therapeutic effect.

### *Implications for research*

Standardizing hypnosis technique, control of confounding variables, standardizing dependent measures, hypnotic susceptibility, blinding, allocation concealment, and power calculations of assessed outcomes are all issues that need to be addressed in future studies.<sup>47</sup> It has been suggested that hypnosis in childbirth may be associated with a low incidence of postnatal depression,<sup>2</sup> despite a reported incidence in the general population of at least 10%.<sup>48</sup> This warrants further investigation as do the effects of hypnosis on duration of labour, mode of delivery, epidural requirements, maternal satisfaction, the inhibition, induction and augmentation of labour, and hyperemesis. No trials have studied the economic implications of introducing hypnotherapy as part of routine clinical practice. Additional costs of providing antenatal hypnotherapy need to be balanced against potential decreases in hospital stay, and epidural or other analgesia requirements and savings secondary to avoiding the treatment of associated complications such as postdural puncture headache. The call for more research on this topic is as relevant today as it was 30 years ago.<sup>49</sup> Future investigations of hypnosis in childbirth should consider studying four groups of patients: two receiving standardized suggestions in and out of hypnosis; one receiving hypnosis with no suggestions; and one usual care, control group.

The evidence presented suggests that hypnosis, alone or in combination with other anaesthetic techniques, may offer advantages over conventional analgesia alone. Hypnosis

potentially satisfies basic ethical principles of medical practice. It respects patient autonomy and may produce benefits without significant harmful effects. Large, high quality studies are required if the potentially advantageous risk/benefit profile of hypnosis in the obstetric population is to be clearly elucidated.

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