Managing labour pain safely

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KEY WORDS

sterile water, labour pain, back pain, midwifery

ABSTRACT

Purpose
The aim of this study was to evaluate the efficacy and acceptability of sterile water injections to relieve lower back pain during labour. This paper discusses the findings from a study of women at two Victorian hospitals (Australia) who used sterile water injections as a method of pain relief during labour.

Procedure
The study involved assessment of pain during labour with midwives recording pain scores pre and post administration of the sterile water injection. Of the 60 women in the study cohort, 52 women returned a questionnaire giving a response rate of 87%.

Finding
The significant finding from the women's responses was that the majority found the administration of sterile water to be a satisfactory method of pain relief. All the participants noted that they would choose this method of pain relief because it would not harm their baby.

Conclusion
The women's comments supported previous findings that intra dermal sterile water injections are a safe, effective pain relieving measure during labour and should be routinely offered as a further option to manage lower back pain.

INTRODUCTION

Data collected during 2003-2004 in Victoria, Australia documented that three quarters of women used analgesia during their baby's birth (Riley et al 2005). The data shows that the type of analgesic and method of administration of analgesia offered during labour have remained unchanged over the past twenty years. The analgesic toolbox available to most women living in Victoria, Australia includes: inhaling nitrous oxide gas; intramuscular injection of opioid; and epidural administration of analgesia. These three methods of relieving labour pain have not been without controversy in terms of efficacy and side effects (Lieberman and O'Donoghue 2002; Olofsson et al 1996). Evidence from the United States of America (USA) has led some researchers to argue that such a limited range of choices reflects professional and economic constraints and does not support a woman's preferences in managing pain (Marmor and Krol 2002). Thus the impetus for this study was to investigate other analgesic options that might have fewer side effects and provide a safe and acceptable alternative for women.

A recent survey of women at a New South Wales, Australia hospital aimed to identify which pain relieving regimens were preferred by them during labour (Henry and Nand 2004). Antenatally, 62% of women identified that they planned to use 'natural' (showers, hot packs) methods of pain relief, primarily to avoid unwanted side effects to themselves and their baby during labour, although only 9% were ultimately successful (Henry and Nand 2004). The majority of women used a combination of 'natural' and pharmacological pain relieving measures throughout their labour. However it remains unclear within that survey whether the relief of pain through the use of pharmacological methods created a more satisfactory birthing outcome for women compared to other non pharmacologic regimens, as pain options were quite restricted. It is reported that in the USA non-pharmacologic methods of pain relief are rarely offered to women in labour despite evidence that continuous labour support, warm water baths, maternal movement and positioning, and touch and massage are very effective in managing labour pain (Leeman et al 2003; Simkin and O'Hara 2002).

In Australia, the only summative data collected on pain management during labour is pharmacological strategies (Riley et al 2005). Ellen Hodnett (2002) in her review of women's satisfaction with the experience of childbirth concluded that pain and pain relief were not the primary factors that enhanced a woman's labour and birth experience and argued that a range of personal and professional care giving factors also impacted on that encounter. Adopting methods of pain management that meet women's needs and expand the options available to them during labour should be a primary focus of maternity care.

This paper discusses the results of a study undertaken during 2003-2004 which explored the labour experience of women attending two Victorian regional hospitals in Australia. The women in the study group participated in a trial of an alternative method of pain relief: the use of intra dermal sterile water injections for the relief of back pain in labour and an evaluation of their effectiveness. Intra dermal sterile water injections have been used in other countries to relieve back pain in labour but their usage remains a relatively unknown pain management strategy in Australia (Martensson and Wallin 1999; Ader et al 1990; Lytzen et al 1989). Relief of pain by counter irritation is an old technique used by medical practitioners for a number of years with varied results (Parsons and Goetzl 1945; Gammon et al 1936). The use of sterile water for back pain during childbirth is derived from a theory suggested by Melzak and Wall (1965) which proposed that pain perception could be altered by introducing a brief period of pain from an alternative receptor site. The exact means by which pain pathways are blocked is unclear but the non isotonic effect of injecting sterile water under the skin causes a counterirritant effect which leads to an altered perception by the labouring woman of the severity of back pain experienced. Severe back pain is a major issue for women in labour and has been reported in approximately 30% of all labours (Melzak and Schaffelberg 1987).

The use of subcutaneous injection of isotonic saline, rather than intradermal injection, has been trialled in overseas studies, where it has been reported to cause less discomfort at the time of injection (Bahasadri et al 2006; Martensson and Wallin 1999) and while it has been effective in some situations, the duration of efficacy is reported to be markedly lessened. The actual stinging sensation reported by women appears to be an important factor in the effectiveness of intradermal sterile water and is likely to be related to the pain experienced at the injection site (Melzak and Wall 1965; Gammon et al 1936).

This study on the effect of intradermal sterile water injections on women's pain during labour reported similar findings to overseas research which validated its usage as a means of managing severe back pain. In the data set, significant pain relief was reported for up to 90 minutes post injection (Peart et al 2006). However these results were reported from the midwives reporting pain measures during labour and not from the women themselves. Satisfaction with the use of intradermal sterile water injections from the perspective of participating women was also investigated. This paper reports on the findings from those questionnaires.

AIM OF THE STUDY

The aim of this study was to evaluate the effect of administration of intradermal sterile water injections on a woman's experience of back pain in labour. Two evaluation techniques were used to collect the data. The first was a pre and post test pain assessment undertaken by midwives who scored the level of back pain experienced by the participants receiving the sterile water injection during labour. The acceptability of the technique was evaluated with a follow-up questionnaire completed by the women two days post partum.

METHOD

Ethics approval for the study was applied for and granted at each of the three organisations involved in the study (Colac Area Health, Wimmera Health Care Group, Horsham and University of Ballarat).

Women were recruited during their pregnancy at each of the participating hospitals. The intradermal sterile water injection technique was discussed and they were shown a video demonstrating the procedure. Over seven hundred women completed a consent form to participate if they experienced back pain while in labour; 432 women in Horsham and 270 women in Colac. The women consenting to participate in the study were made aware of the probable discomfort they would experience, that is the stinging sensation felt when the sterile water injection was administered. Staff at each maternity unit also underwent formal competency training in the technique.

Sixty (60) women (30 at Colac and 30 at Horsham) agreed to participate in the clinical study when they experienced severe back pain during their labour. Once they identified a need for the sterile water injection an assessment of pain severity using a Visual Analogue Scale (VAS) was undertaken immediately prior to injection, five minutes after and every 30 minutes for up to three hours. The procedure involved the intradermal injection of 0.2-0.5ml of sterile water into four sites in the Michaelis Rhomboid or lumbar-sacral region of the spine. Two midwives simultaneously injected to reduce the number of stinging sensations experienced by women.

On day two post partum, satisfaction surveys were distributed to all women who used sterile water injections for pain relief during their labour. The questionnaires collected demographic information and qualitative data on the best and worst aspects of the women's birthing experience. That data included information on their age, parity, previous births, their current labour and birth, methods of pain relief they used and their understanding of the purpose of sterile water injections. The questionnaires were posted back to the principal researcher by the study participants in a self-addressed envelope. A total of 52 were returned, giving a response rate of 87%. Twenty-two (22) questionnaires were returned from women who attended Colac Hospital and 30 were returned from women who had attended Horsham hospital for their birth.

RESULTS

Data were analysed using the statistical package SPSS (Version 9.0). Data collected from the 52 women demonstrated that a high proportion of women were aged under 30 (63%) (table 1) and experiencing their first birth (61.5%) (table 2). Back pain during labour is a more common phenomenon for first births (Hodnett 2002) so it is not a surprising finding that primagravida were over-represented in the study participants.

Table 1: Age of women

AGE	NUMBER	%
20-25	11	21.2
26-30	22	42.3
31-35	12	23.1
36-40	7	13.5
Total	52	100

Table 2: Parity after most recent birth

PARITY	NUMBER	%
One	32	61.5
Two	12	23.1
Three	7	31.5
Four	1	1.9
Total	52	100

The women in the study (table 3) reflected slightly higher rates of vaginal birth than the state average in 2003-2004 (69% versus 58%) (Riley et al 2005). However the number of women participating was too small to make any useful assertions regarding the efficacy of sterile water injections and their influence on birth outcome and this was not a stated aim of this research project. However overseas research has demonstrated little significant effect of any analgesia on outcome during a woman's labour and birth (Ader et al 1990).

Table 3: Outcome of most recent birth

Type of birth	Number (%)	State average 2004 (%)
Vaginal birth	36 (69.2)	56.9
Forceps birth	2 (3.8)	6.2
Vacuum birth	4 (7.7)	6.9
Emergency C/S	10 (19.2)	14.1
Total	52 (100.0)	

The questionnaire sought to identify whether women found intradermal sterile water injections an acceptable pain management strategy for their labour. All the women (100%) who participated in the research stated they considered the harmless effect of sterile water injections on their baby during labour an important consideration in its choice. Despite the acknowledged pain felt by women using sterile water (non isotonic sterile water causes severe localized pain for approximately 20 seconds following injection), they identified that the relief achieved by the water injections was worth the accompanying pain. Intramuscular and epidural narcotic administrations have a range of potential short and long-term effects on women and their infants (Henderson et al 2003; Nissen et al 1995). The lack of side effects on the foetus made using sterile water injections an attractive option for many of those women who participated in the study. One woman commented:

The injections do really sting but compared to the back pain it's worth it. And there's no drug worries compared to other options like pethidine. I'm very glad the option was available to me, as I would have refused pethidine at the point where I used the sterile water and thus laboured much longer in pain (Horsham).

Women noted in the questionnaire just how painful the sterile water injections were.

The site pain and back pain was completely gone in a minute or two. But the sterile water was very painful at the time (Colac).

The sterile water was like magic with the backache itself. It provided very good pain relief until it wore off (Horsham).

Sterile water provided immediate relief for three quarters of the women who participated in this study. More than 90% of women reported a reduction in back pain after 5 minutes and this effect was observed to continue for up to 90 minutes for some women.

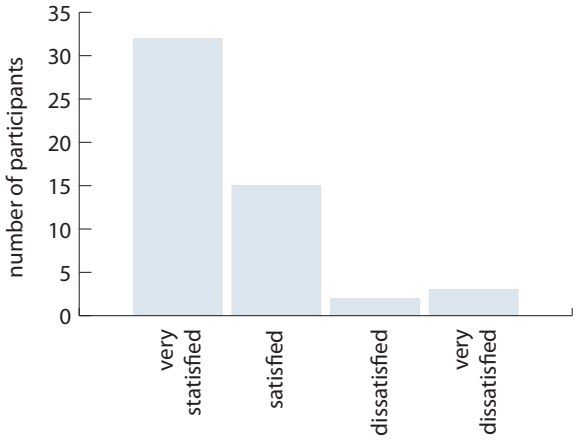
The site pain and back pain was completely gone in a minute or two (Colac).

It worked with the following contraction [after the sterile water injection] and lasted (Horsham).

Worked instantly and was fantastic for about an hour (Horsham).

Women were asked to rate their satisfaction with sterile water injections. Of the 52 respondents, 47 (90%) stated they were satisfied or very satisfied with the pain relief provided (figure 1).

Figure 1: Satisfaction of women with the pain relief provided by sterile water?



Problematic from the outset of this study was the newness of the method. It took more time than the researchers anticipated to generate an awareness of sterile water injections as a pain option among local women and health professionals alike. Both groups were hesitant at first to try something new. One woman summed up the issue succinctly by commenting:

The worst aspect of this study was convincing midwives present at labour that I was serious about trying it as they were cynical about the technique working. Hospitals should encourage nursing and midwifery staff to try the technique on themselves. Yes the injections do really sting but compared to the back pain its so worth it (Horsham).

Those women who were dissatisfied with sterile water injections as a pain relieving option in labour felt that the pain of the injection outweighed the benefits or did not experience adequate relief from its use. For example one woman made the comment:

It's just that the injections were so painful initially. If the injections weren't so painful I would have no problem recommending them to everyone (Horsham).

DISCUSSION

Sterile water injections for back pain in labour have been demonstrated in a number of studies to be a safe, effective method of pain relief for women in labour (Peart et al 2006; Reynolds 2002; Trolle et al 1991). While they are not the analgesic of choice for all women, within this study the majority of women commented positively on their pain reduction following administration. There exists no single method of analgesia in labour that is suitable for all women or all labour situations. However providing women with an increased range of options, particularly options that carry no risks to the baby, would seem to be an important consideration in assisting women to safely manage labour pain. There is no recorded Australian data on non-pharmacologic pain relief used in labour, despite the probable uptake of multiple methods by almost all women. The utilisation of non-pharmacologic methods is poorly understood and often overshadowed by the dominance of pharmacological options. The reported data on the uptake of pharmacological management of labour pain suggests that all health professionals collude to ensure it remains a primary strategy for pain relief. It is important that maternity providers seek alternatives and offer a broader range of effective regimens to relieve pain during labour particularly as pregnant women identify this is an important aspect of their birth experience.

CONCLUSION

The data collected from the questionnaires completed by women who used intradermal sterile water during labour suggests that it was a positive experience for many. Women recognised that the use of a pain relieving modality that had no adverse effect on their baby was an important factor and is a significant consideration for health professionals when discussing with women their pain needs during labour. It was not the method of choice for all

women, however it represents an important, safe, drug free option that should be made available to all women experiencing unrelenting back pain during childbirth.

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