Original Article

Effectiveness of Intradermal Sterile Water Injections over the Sacrum for the Relief of Labour Associated Backache; A Cross-Sectional Study

Nazia Siraj[1], Irum Sohail[2]

[1]Federal Government Policlinic Hospital PGMI, Islamabad, [2]Professor, KRL Hospital Islamabad

Correspondence: Dr Nazia Siraj
Dept of Obstetrics and Gynecology
naziasiraj5@gmail.com

Abstract

Objective: To assess the effectiveness of intradermal injections of sterile water over the sacrum for the relief of labour associated backache.
Methodology: The study was conducted at department of Obs and Gynae KRL hospital Islamabad from July 2017 to Dec 2017. A sample of 100 pregnant women in labour with complain of severe backache during the first stage of labour was taken. All of them received intradermal injections over the sacrum in order to relieve it or to reduce the intensity of pain. The outcome was measured in Visual Analogue Scale. The intensity of pain was measured in a range of 0-10 where 0 being no pain at all and 10 being the most intense pain. Patients under study were requested to rate their pain against this scale before the injections were administered. After the treatment, they were again asked to rate their pain at the intervals of 10 minutes, 45 minutes and then 90 minutes.
Results: The mean VAS score before giving the injection was 8.9 and after 10 minutes of giving injection it was reduced to 3.7 which further decreased over next half hour and the effect lasted for at least 2 hours in most of the patients. The mean visual analogue scale pain score for backache was significantly lower compared with initial values at 10 and 45 minutes after treatment. In opinion of most of the patients, intradermal injections are harmless and effective; thus, they should be part of the routine intrapartum care.
Conclusion: Intradermal injections of sterile water are effective in reducing backaches during 1st stage of labour. This method is easy, cost effective, without any side effects and good patient satisfaction due to pain relief.
Keywords: Intradermal injections, Labour, Backache

Cite this article as: Siraj N, Sohail I, Effectiveness of Intradermal Sterile Water Injections over the Sacrum for the Relief of Labour Associated Backache; A Cross-Sectional Study. J Soc Obstet Gynaecol Pak. 2023; 13(4):389-392.

Introduction

Labour pain is an inevitable part of child birth and severe backache usually accompany it. Lower back pain effects almost 50% of women in labour and one third of them have a severe form of it.[1] It is more pronounced with a fetal occipito-posterior position, persistent asynclitism. It is not only distressing for the women but also becoming a reason for increase in elective cesarean section rates. So, pain relief and psychological support are essential component of modern maternity care.

Continuous research is going on to evolve a pain relief method which is not only free from side effects but is effective as well. Methods which are already in practice include Epidural analgesia, Entonox and narcotics injections e.g. pethidine, promethazine, pentazocine, but these have significant medical risks for the mother and the baby. With increasing awareness of side effects e.g increased incidence of need for augmentation, instrumental deliveries, cesarean section, perineal tear, etc many women refuse to opt them.[2] Cost is another issue leading to the refusal of the procedure.[3]

Many non-pharmacological methods are tested over time. One article evaluated different studies on 13 non-pharmacological methods including continuous labour support, baths, maternal movements and positioning, Acupuncture, massages, transcutaneous electrical nerve stimulation, music and audio-analgesia and hypnosis. It states that many among these methods are effective to some extent.[4]

Authorship Contribution: [1,2]Conception of idea, Data collection,[2] critical revision of research, drafting and final approval of manuscript,

Funding Source: none
Conflict of Interest: none

Received: Nov 10,2022
Accepted: Aug 29, 2023

Sterile water injection is inexpensive, requires basic equipment, easily available, and appears to have few side effects as they do not affect conscious level of mother and the baby, doesn't restrict mobility of mother and doesn't need catheterization. It doesn't need any special training as they remain considerably effective if injections were given anywhere in the dermatome supplied by T10-L1 so don't need much accuracy considering the location. Intradermal injections over sacrum provide good backache relief.[5] Its mechanism of action can be explained using "*gate control theory*". Afferents from uterus and cervix end up in spinal segments T10-L1 the same area also supply sensory input to skin over the back. As touch receptors are more sensitive and faster than pain, stimulation of these receptors blocks the entry of pain signal into spinal cord.[6] As water is different from other body fluids in consistency it will cause brief pain initially but that subsides within a minute.

This is the first study of its type to be conducted in Pakistan. Only one study conducted in the region which showed significant results.[6] About 12 studies conducted worldwide with little differences in materials and methods including one systemic review showed positive results and suggest need of more research.[7] As most of the deliveries in Pakistan are conducted in small basic health units, in the hands of traditional birth attendants and midwifes where facilities for more advance procedures like Epidural are not available so if proven effective it can be of great value. Similarly, women sensitive about side effects of invasive methods can also get benefits from it. So, the study was conducted to assess the effectiveness of this method for the relief of labour associated backache.

Methodology

This cross-sectional study was conducted in Department of Obstetrics and Gynecology KRL hospital Islamabad from July 2017 to December 2017 after taking approval from hospital's ethical committee. Sample was collected by non-probability consecutive sampling. Total of 100 women admitted to the labour ward in first stage of labour who are also complaining of backache were included in the study. Sample size was taken as in reference study[4] and according to the work load of the hospital. They were all at less than 5 cm cervical dilatation. The exclusion criterion includes patients who requested for Epidural or any other form of analgesia and those who refused for it. Procedure was explained and Informed consent was taken. Demographic Data collected include age, gravidity, parity, gestational age.

Then the researcher trainee gave 0.1ml of sterile water injections each on 4 points on the skin over the sacrum, one at posterior superior iliac spine bilaterally and one 1-2 cm below and medial to the first injections on both sides. Injections were given with 1 ml insulin syringe with patient in sitting position.

The intensity of pain was measured using Visual Analogue scale in a range of 0-10 where 0 being no pain at all and 10 being the most intense pain. Patients under study were requested to rate their pain against this scale before the injections were administered. After the treatment, obstetrics residents at duty asked the patients to rate their pain at the intervals of 10 minutes, 45 minutes and then 90 minutes. At 10 minutes to check whether it is effective or not and at 45, and 90 minutes to check the duration of pain relief. The data entered and analyzed by using statistical software program SPSS version 22. Descriptive analysis of all the study variables was conducted to calculate frequency, range, minimum (min) maximum (max), and means with standard deviation.

Results

Women between 18 – 40 years participated in the study mean age was 27.64±4.64 years. Most women at or more than 37-week gestation. Majority of the patients were either nullipara (36%) or para one (24%). Demographic characteristics of the patients shown in table I.

The mean VAS score before giving the injection was 8.9 and after 10 minutes of giving injection it was reduced to 3.6 which further decreased over next half hour and the effect lasted for at least 2 hours in most of the patients. Table II. Among those who were not delivered within 90 minutes we found that backache came back. It was less intense but present. It may be due to its less

Table I: Demographic characteristics of participants.

	Range	Minimum	Maximum	Mean	SD
Age	22.00	18.00	40.00	27.64	4.64
Gravida	5.00	1.00	6.00	2.43	1.46
Para	3.00	.00	30.00	1.72	3.28
Gestational Age	4.00	37.00	41.00	37.71	4.63

effectiveness in 2nd stage or it has duration of action less than 90 minutes. Only one of the patients received the second set of injections because most of the patients delivered before completion of 90 minutes and rest being in advance labour.

Only one patient requested for epidural analgesia and was excluded from study. 5 patients ended up in Em. LSCS due to obstetric indications. 12 pts delivered within 45 min, 45 delivered within 90 min.

Table II: Mean pain intensity score before and after injections.

	VAS SCORE		
	N	Mean	SD
Before_inj	100	8.970	1.494
After_10_Min	100	3.630	2.073
After_45_min	88	3.760	2.198
After_90_min	55	6.190	2.259

Discussion

Sterile water injections were observed to be good at reducing backache along with other benefits over narcotics like they do not affect conscious level of mother and the baby. It doesn't restrict mobility of mother and doesn't need catheterization. It remains considerably effective even if injections were not given with much accuracy [8] or two instead of four injections were given.[9]

Mean pain scores in this study were found to be higher than compared to reference studies e.g. in one study conducted in India mean scores before giving injections, after 10 minutes, 45 minutes and 90 minutes were lower than our patients.[6] This can be explained as we included the patients up to the dilatation of 5cm while in that study patients with cervical dilatation only up to 3 cm were included so naturally our patients being in advance labour felt more intense pain. Results were significant in other reference studies too. A randomized control trail in Turkia which compared sterile water against dry injections they found these injections to be very effective after 30 minutes this is in line with our study. They however studied the effect for longer time period although the pain relief decreased but still statically significant effect observed after 180 minutes. They observed a small increase in cesarean sections in sterile water group although not significant and even with a shortened duration between injections and delivery. The satisfaction levels from the analgesic injection, wish for reuse in further pregnancies, and thoughts of recommending it to others were also significantly higher with sterile water injections.[10] Another RCT from Iran has similar findings in terms of subcutaneous injections for backache relief but they also studied the effect of saline and they used both techniques subcutaneous and intra cutanoeus they claim that saline is more effective than sterile water.[8] No effect of these injection was seen on fetal outcomes like apgar score. [8,10]

Meta analysis suggested further randomized control trails to determine the efficacy and other maternal or fetal outcomes, and effect on mode of delivery of sterile water injections.[5,11] Similarly there are no clear recommendations on number of injections, location of injection, technique, amount of sterile water so this area also need further inquiry. A literature search states that subcutaneous injection technique is possibly less painful than the intracutaneous technique administered, but its effectiveness is not well documented. The effect seems to be related to the number of injections and the amount of sterile water in each injection.[3]

A different study exclusively focused on nulliparous women to determine the comparative effectiveness of the intradermal and subdermal methods. However, no noticeable difference in terms of pain relief was identified.[12] While the samples were similar, it's important to note that since only intradermal injections were used in our study, the results cannot be directly compared. One large scale study is being conducted in Australia to check effectiveness of these intradermal injections on labour associated uterine contractions pain.[13] An integrative review explored the experiences and perceptions of midwives and women using Sterile Water Injections for labor pain relief. There was widespread uncertainty linked to the absence of clear guidelines, insufficient evidence, and inadequate patient counseling.[14] This further suggest implications and scope of these relatively harmless injections need to be studied and documented so that pharmacological methods can be avoided.

A double-blind, multicenter trial conducted in Australian and English maternity units investigated the impact of sterile water injections on cesarean section rates. The findings indicated no decrease in caesarean delivery rates when compared to a placebo; nevertheless, there was a significant effect in relieving back pain associated with labor.[15] However, it is crucial to acknowledge that the study has limited evidence to either support or refute this conclusion.

Strength of this study was that it was the first study to be conducted in Pakistan and also scarce data is available from the region including neighboring countries. All the

studies previously conducted included patients in latent phase of first stage of labour while most of the patients in this study were in active phase of first stage of labour. It was conducted in a setup where epidural was available but still majority of women declined it.

Limitations included small sample size of study, there are chances of bias as no comparison was done, effects on mode of delivery, duration of 2nd stage, and fetal outcomes was not studied.

Conclusion

Intradermal injections of sterile water significantly reduced the backache associated with labour for about one to two hours. Only side effect is sharp pain which is observed initially lasting for less than 1 minute. It can be used in setups where available methods to relieve pain during labour are limited, where funds are limited and skilled personals are not available round the clock. Similarly, can be offered to patients who refuse for invasive methods, or to patients in early latent phase waiting for epidural. Also, its effectiveness for abdominal pain need to be studied.

References

1. Katonis P, Kampouroglou A, Aggelopoulos A, Kakavelakis K, Lykoudis S, Makrigiannakis A, Alpantaki K. Pregnancy-related low back pain. Hippokratia. 2011 Jul;15(3):205.
2. Ezeonu PO, Anozie OB, Onu FA, Esike CU, Mamah JE, Lawani LO, Onoh RC, et al. Perceptions and practice of epidural analgesia among women attending antenatal clinic in FETHA. Int J Womens Health. 2017 Dec 12:905-11.
3. Mårtensson LB, Hutton EK, Lee N, Kildea S, Gao Y, Bergh I. Sterile water injections for childbirth pain: An evidenced based guide to practice. Women Birth. 2018;31(5):380-385.
4. Simkin P, Bolding A. Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. J Midwifery Womens Health. 2004 Nov-Dec;49(6):489-504. doi: 10.1016/j.jmwh.2004.07.007.
5. Derry S, Straube S, Moore RA, Hancock H, Collins SL. Intracutaneous or subcutaneous sterile water injection for relieving pain in labour. Cochrane Database Syst Rev. 2011;1
6. Saxena KN, Nischal H, Batra S. Intracutaneous injections of sterile water over the secrum for labour analgesia. Indian J. Anaesth. 2009 Apr;53(2):169.
7. Fogarty V. Intradermal sterile water injections for the relief of low back pain in labour—a systematic review of the literature. Women and birth. 2008 Dec 1;21(4):157-63.
8. Rezaie M, Shaabani S, Jahromi FS, Jahromi ME, Dakhesh S. The effect of subcutaneous and intracutaneous injections of sterile water and normal saline on pain intensity in nulliparous women: A randomized controlled trial. Iranian journal of nursing and midwifery research. 2019 Sep;24(5):365.
9. Sa single vs. a four intradermal sterile water injection for relief of lower back pain for women in labour: a randomised controlled trial. Midwifery. 2013 Jun 1;29(6):585-91.
10. CKoyucu RG, Demirci N, Yumru AE, Salman S, Ayanoğlu YT, Tosun Y, Tayfur C. Effects of Intradermal Sterile Water Injections in Women with Low Back Pain in Labor: A Randomized, Controlled, Clinical Trial. Balkan Med J. 2018 Mar;35(2):148.
11. Hutton EK, Kasperink M, Rutten M, Reitsma A, Wainman B. Sterile water injection for labour pain: a systematic review and meta-analysis of randomised controlled trials. BJOG: An Int J Gynaecol Obstet . 2009 Aug 1;116(9):1158-66.
12. Almassinokiani F, Ahani N, Akbari P, Rahimzadeh P, Akbari H, Sharifzadeh F. Comparative analgesic effects of intradermal and subdermal injection of sterile water on active labor pain. Anesthesiology and pain medicine. 2020 Apr;10(2):
13. Lee N, Gao Y, Mårtensson LB, Callaway L, Barnett B, Kildea S. Sterile water injections for relief of labour pain (the SATURN trial): study protocol for a randomised controlled trial. Trials. 2022 Dec;23(1):1-9.
14. Stulz V, Liang X, Burns E. Midwives and women's experiences of Sterile Water Injections for back pain during labour: An integrative review. Midwifery. 2021 Dec 1;103:103164.
15. Lee N, Gao Y, Collins SL, Mårtensson LB, Randall W, Rowe TM, Kildea S. Caesarean delivery rates and analgesia effectiveness following injections of sterile water for back pain in labour: a multicentre, randomised placebo-controlled trial. EClinicalMedicine. 2020 Aug 1;25.