ORIGINAL RESEARCH PAPER

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EVALUATION OF EFFECTIVENESS OF INTRADERMAL WATER BLOCKS IN RELIEVING LOW BACK PAIN DURING LABOUR.

KEY WORDS: Intradermal water blocks, visual analog scale.

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ABSTRACT

Objectives :-
1) To study effectiveness of intradermal sterile water injections in relieving low back pain during labour.
2) To find out whether these injections have any major side effect.

Materials and method :- This prospective observational comparative study was conducted on 400 pregnant women in department of Obstetrics and Gynaecology, Kamla Raja Hospital, Gajra Raja Medical College, Gwalior. Patients were randomly divided into 2 groups with equal no. of patients in each group. 200 patients in intervention group received 4 intradermal injections of sterile water 0.1 ml in lumbosacral region while another 200 patients in non-intervention group did not received any analgesia and used as controls. Pain scores were assessed using visual analog scale at 0 min., 10 min., 45 min. and 90 min. in both groups.**Results:-** There was statistically significant reduction of pain scores in sterile water group but not in control group at 10 min.,45 min. and 90 min. after giving injections. No major side effect of sterile water injection was found except the initial burning or stinging sensation at injection site during its administration which lasted for only a few seconds.**Conclusion:-** Intradermal sterile water injection is an effective method of pain relief for women in labour pain without any major side effect.

Introduction:-
Labour pain is a unique visceral pain that is associated with a wonderful and meaningful event of life -"birth of a baby"[1].

Labour pain is a nociceptive pain and is a subjective experience influenced by physiological, psychological and sociocultural factors.

There are 2 types of back pain during labour ,one is pain of uterine contraction shooting to back and other is continuous low back pain so that both together becomes really intense.It is thought that continuous low back pain is caused by stretching and pressure in the area surrounding the uterus in contrast to the rhythmic pain that are related to uterine contractions[2].Continuous low back pain during labour also called as back labour is different from contraction pain as it originates from lumbosacral region, that is supplied by afferent neurons ending in dorsal horn of spinal cord at T_{10}-L_1 segment and is a "referred pain"[2]. This low back pain most likely occurs during latent and early active phase of 1st stage of labour.

There are many options of pain relief during labour and birth like narcotics, inhalants, regional blocks like epidural analgesia, spinal and Paracervical blocks but all of these are associated with one or more side effects to the mother or baby. Other drawbacks with these methods are their high cost and unavailability due to limited resources, also these methods are not appropriate for all the women.

So interest towards non-pharmacologic methods of pain relief is increasing. These involve intradermal water blocks i.e.sterile water injections , continuous labour support, warm water bath, maternal movements, positioning, touch and massage ,accupunture ,relaxation and breathing.[3,4]

Intradermal water blocks also called sterile water injections are the injections of small amount of sterile water (0.05-0.1 ml) intradermally at 4 points lateral to the lumbar spine on lower back ie. Lumbosacral area. These injections causes a brief but intense stinging sensation initially that last for 20-30 seconds followed by relief from back pain.[5]

Use of sterile water injections for pain relief is based on gate control theory[6] or counter irritant effect, a process by which pain felt in one part of body may be reduced by stimulating the skin in same dermatomal area with either hot, cold, scratchy, stingy or electrical stimulus. sterile water injections causes distension in the skin and thus causes mechanical irritation on tissues which stimulates nociceptors and mechanoceptors.[1]

Materials and Methods:-
This was a prospective observational comparative study conducted on 400 pregnant women who were admitted in department of Obstetrics and Gynaecology, Kamla Raja Hospital, Gajra Raja Medical College, Gwalior from August 2017 to July 2018.

Inclusion Criteria:-
1. Primigravida with singleton pregnancy with gestational age ≥37 weeks with cephalic presentation.
2. Pregnant women in early active phase of 1st stage of labour (cervical dilation around 4 cm)
3. Women requiring relief from low back pain of labour.

Exclusion criteria:-
1. Pregnant women not willing for the procedure.
2. Patients who have received any other analgesia following onset of labour.
3. Primigravida in advanced labour.
4. Infection in area of injection.
5. Patients with low platelet count or any coagulation disorders.
6. Patients with associated medical disorders.
7. Patients with neurological disorders or any history of psychiatric disorders.

All the patients were randomly divided into 2 groups:-
1. Study group/Intervention group (n=200) – Patients were given sterile water injections for pain relief.
2. Control group/Non intervention group (n=200) –They were not given any analgesia and used as controls.

Written informed consent was taken from all participants.

Procedure consisted of 4 intradermal injections of 0.1 ml of sterile water using insulin syringe with 25 gauge needle to form 4 small blebs, one over each posterior superior iliac spine and 2 other placed approximately 2-3 cm below and 1-2

cm medial to each of the 1st site.

Technique of administration :-

1. After explaining procedure patients were asked to adopt the sitting position as during spinal anaesthesia.

2. For identification of injection sites, we stood behind patient, placed the palms of hand around her waist with index finger at the level of anterior superior iliac spine, thumbs aligned to the same level as index finger over sacral area, this marked area for 2 superior injections . Site for 2 lower injections were approximately 1-2 cm medial and 2-3 cm below superior injections sites. These 4 points overlies area called "Michaeli's Rhomboid "[7].

3. After cleaning skin with alcohol wipe , 0.1 ml of sterile water was injected intradermally at a angle of 5-15° at each of 4 sites to raise small blebs.

4. Patients were instructed not to rub, touch, massage or apply other counter pressure to the injection site for nearly 30 mins after injection.

5. After procedure, assessment of pain was done using visual analog scale (VAS)[8] at 0 min (just before giving injection), at 10 min, 45 min, and 90 min in both groups. Patients were asked to choose from number 1-10 on visual analog scale (VAS)[8] that represented their pain intensity. (Figure1)

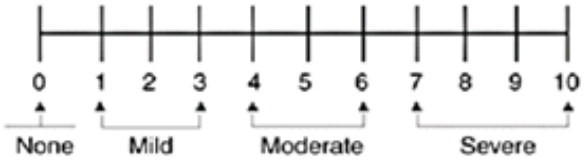

Fig 1. visual analog scale(VAS)8

Data collected from 400 patients was analysed statistically by using "graphpad" and "medcalc" softwares and test used were paired t- test, unpaired t-test ,chi-square test.

Results:-

Table 1:- Distribution showing mean age and mean gestational age of patients

	Intervention group	Non intervention group
Age (yrs)	23.46±2.8	23.75±2.6
Gestational age (weeks)	38.75±1.01	38.59±1.09

The women in two groups were similar with regards to age ,gravidity and gestational age(Table 1). As per cervical dilatation all were in early active phase of 1st stage of labour (around 4 cm cervical dilatation).

Table 2:- Distribution showing mean VAS scores at different times in 2 groups.

Group	At 0 min	At 10 min	At 45 min	At 90 min
Intervention group	9.78±0.47	7.3±1.38	6.96±1.27	7.21±1.23
Non intervention group	9.75±0.5	9.78±0.43	9.8±0.38	9.77±0.52
P value	0.4726	0.0001	0.0001	0.0001

Initially mean VAS score before intervention at 0 min. was 9.78±0.47 in Intervention group and 9.75±0.5 in non intervention group. This difference is statistically insignificant (P>0.05) but the mean VAS scores at 10 min, 45 min, and 90 min were reduced significantly in intervention group but not in non intervention group (P<0.05)(Table 2).

Table 3:- Distribution showing statistical significance of change of VAS scores in intervention group

	From 0-10 min	From 0-45 min	From 0-90 min
Scores	(9.78±0.47)-(7.3±1.38)	(9.78±0.47)-(6.96±1.27)	(9.78±0.47)-(7.21±1.23)
Change	2.48±0.91	2.82±0.80	2.57±0.76
P value	0.0001	0.0001	0.0001

As shown in table 3, statistically there was significant reduction of mean VAS pain score at 10 min, 45 min, and 90 min as compared to pain score as 0 min. in intervention group.(P=0.0001)

Maximum change of VAS score was seen at 45 min. indicating maximum pain relief.

Table 4:- Distribution of patients on the basis of burning sensation at the time of injection administration in intervention group.

Burning sensation	No. of patients(n)	%
Present	192	96%
Absent	8	4%
Total	200	100%

Nearly almost all women in intervention group (96%) had initial burning sensation at the time of injection administration at local site but it lasted for only a few seconds (Table 4).

Discussion :-

Although labour and delivery are natural phenomenon but the pain associated with labour is very severe or extreme and its a major issue for most women in labour. Controlling this pain without harm to mother and fetus is a primary focus during labour experience. Pharmacologic measures are more effective than non pharmacologic measures but they are more costly and have potential adverse effects like narcotics can cause maternal drowsiness, nausea, vomiting and neonatal respiratory depression. Epidural analgesia may cause increase in pyrexia during labour[9] and possible long term backache and neurological symptoms[10]. Epidural analgesia can also cause motor block to adversely affect the mobility of labouring women, even some women may feel disconnected from their birth and may loose reflex desire to push[11]. Also epidural analgesia is not appropriate for women with previous cardiac disease or respiratory problems.

Sterile water injection is one of the non pharmacological method that have been used for relief of labour pain in various previous studies and have been found effective.

In our study the mean age of patients in intervention group was 23.46±2.8 yrs and 23.75±2.6 yrs in non intervention group(table 1). With regards to age, study results are comparable to study by Saxena et al(2009)[1] and Howieda (2018)[12] where mean age of patients in sterile water group was 24.72±3.6 yrs and 24.6±5.3 yrs, while in normal saline group 25.80±3.6 yrs and 22.4±4.1 yrs respectively.

This seems to be true in Indian scenario, as it is seen that early age of girls at the time of marriage results in their 1st pregnancy usually under 25 yrs of age and pain during labour is more commonly experienced during 1st birth.

In present study, the mean gestational age was 38.75±1.015 weeks in intervention group and 38.59±1.099 weeks in non intervention group(table 1). Both groups were comparable statistically. In study by Saxena et al[1], the mean gestational age was 38.12±1.38 weeks and 37.72± 1.08 weeks in sterile water and normal saline group respectively.

In our study all patients were similar with regards to gravidity and cervical dilatation as all were primigravida having cervical dilatation around 4 cm.

In our study the mean pain scores were reduced significantly after giving sterile water injections at all the 3 time points in intervention group but not in non intervention group where nothing was given. If we review literature then in almost all previous studies like Martensson et al (2008)[5], Saxena et al(2009)[1], Bahasadri et al (2006)[13], Kushtagi and Bhanu (2009)[14], Wiruchpongsoanon(2006)[15], the mean pain scores were significantly lower in sterile water group at all time points. Since most women expect childbirth to be painful and accept it as a reality, they think that it is almost impossible to have a totally painless labour, therefore it is conceivable for low reductions in VAS pain scores in our study.

The only side effect of sterile water injection we found in our study was initial stinging or burning sensation at the site of injection but that lasted for only 20-30 seconds. This side effect was felt by majority of women (96%) in intervention group.

Sterile water evokes intense pain due to difference in osmolality as solutions of osmolality other that blood irritates biological tissues and since sterile water is hypoosmolar it probably irritates the nerves leading to brief pain initially followed by analgesia later[1].

Apart from drug free and having no major side effect, sterile water injections are advantageous in many other ways as well, like they provide often immediate effect with no harmful effect on mother's state of consciousness and no effect on baby ,does not limit mobility, does not adversely affect labour progress, simple procedure that can be administered by nurses as well without specialist care and can be repeated as needed.

Conclusion:-

Thus from our study it can be concluded that :-

1. Sterile water injections provide statistically significant improvement in pain relief to the women experiencing low back pain during labour.
2. Secondly as sterile water is drug free ,no major side effect was observed other than an initial burning sensation at local site that lasted for short time..

Thus it can be said that sterile water injection is an easy, safe, effective and relatively inexpensive method of pain relief which does not require any specialization for administration .So in future this technique can be of particular use to doctors in small obstetrics units that do not have access to pharmacological pain management interventions or it can be helpful for women who want to avoid medications during labour and birth.

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