International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

A Study to Assess the Effectiveness of Abdominal Effleurage on Labor Pain Intensity and Labour Outcomes Among Nullipara Mothers During 1st Stage of Labor In Selected Hospitals of District Ambala, Haryana

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Abstract: ***A quasi experimental study was conducted with the purpose to assess and compare the pre-test and post-test labour pain intensity score, labor outcomes and to determine the association of level of labor pain intensity among nullipara mothers during 1st stage of labor in experimental and comparison group. Non probability purposive sampling technique was used to select the study subjects. Structured peroforma was prepared to collect baseline data, Numeric pain intensity scale (standardized scale) was used to assess the pain intensity immediately before and after the abdominal effleurage and routine maternity care and record analysis peroforma was used to assess the labor outcomes (maternal outcomes in terms of total duration of labor, nature of delivery and fetal outcomes in terms of APGAR score at 5 min after birth and fetal heart sound score immediately before and after the abdominal effleurage and routine maternity care). Findings revealed that abdominal effleurage was having significant effect on reducing the labor pain intensity during active phase but was not effective during transition phase in experimental group. Further the result shows that there was no significant effect on total duration of labor, fetal heart sound score and finally the APGAR score of newborn at 5 min after birth.***

Keywords: Effectiveness, abdominal effleurage, labor pain, nullipara mothers, labor outcome, First stage of labor

1. Introduction

Childbirth is one of the greatest event in every women's life. Having fantacies about pregnancy and motherhood, when confronted with the reality, many of them doubted their ability to cope with this great event in their lives. Influenced by family, friends and relatives, they get prepared in many ways as they approach the experience of child birth.[1] Even though delivery is a natural phenomenon, it has been demonstrated that the accompanying pain is considered severe or extreme in more than half of cases. Besides conventional approaches, such as epidural analgesia, many complementary or alternative methods have been reported to reduce pain during labor and delivery. Complementary or Alternative Medicine (CAM) can be defined as theories or practices that are not part of the dominant or conventional medical system. Physicians are expected to provide pharmacological therapy, whereas midwives, nurses and other auxiliaries are required to assist patients with psychological methods, and in fact use alternative approaches more often. The theoretical bases for many alternative methods derive from Eastern tradition or philosophy.[2] The percentages of the population who report having used CAM at least once vary considerably, from 80% in Africa, 70% in Canada, 49% in France, 46% in Australia, 42% in the US, 40% in China, 31% in Belgium and 18% in Holland. According to a study by the Spanish Ministry of Health's Observatory of Natural Therapies, 95% of the Spanish population are aware of natural therapies and 23% have used one.[3] Traditional midwives and wise women were often the "barefoot doctors" of their tribe or village. The traditional midwife is a holistic practitioner integrating knowledge of herbs, massage techniques, spiritual healing and maternal health care. Before Western medical practices displaced traditional midwifery, the touch and massage of a midwife or birth attendant was a central component of prenatal care around the world. In the absence of obstetrical tools and gadgets, a midwife had her eyes, ears and hands to diagnose and assist pregnant women. By constant practice, the midwife's senses of observation and intuition were finely tuned. Today, traditional healers and midwives skillfully integrate the ancient healing arts of massage and midwifery, as they have for thousands of years. . In the medical model, childbearing is analyzed from a pathological and intellectual perspective. Obstetrical and gynecological practices support the deprivation of human touch, pathologize the female body, and increase childbearing morbidity and place women in a subservient role to the institution. However, pregnancy is not a pathological event or an intellectual construct; it is a healthy, primal and life-giving process.[4] Various pharmacological and non- pharmacological pain relieving methods are available for women in labor. Pharmacological methods involve epidural analgesia, pudental nerve block analgesia, administration of pethidine etc, Non-pharmacological pain relief approaches have different advantages such as lack of side-effects for mother and fetus and also being pleasant for both of them. Some of these approaches are muscle relaxation, respiratory techniques,

hydrotherapy, music therapy, TENS (transcutaneous electrical nerve stimulation), yoga, Hypnotherapy and massage therapy.[5] Effleurage is the most basic massage movement and it is often used as a linking movement. Effleurage is high gliding movement over the skin that always maintain contact and directs the strokes towards the heart. An effleurage movement is usually repeated over several times over the same area on the body. Effleurage is performed by the laboring woman or by her husband or by the midwife. The keys to making labour massage effective are repetition, a slow steady speed, comfortable pressure and a confident masseuse. Repetition allows the thinking brain to tune out.[6]

2. Review of Literature

Mortazavi SH, Khaki S et al conducted a true experimental study in Tehran, Iran to assess the effects of massage therapy and presence of attendant on pain, anxiety and satisfaction levels during labor. A sample of 120 primiparous mothers with term pregnancy was divided randomly in to massage, attendant and control groups. Massage group received firm and rhythmic massage during labor in three phases. Evaluation was done after 30 minutes massage at each stage. Self reported Present Pain Intensity scale was used to measure pain and Visual Analogue Scale was used for measuring anxiety and satisfaction level. Massage group had lowered pain state in second and third phases in comparison with attendant group but the anxiety level was lower in attendant group ($p<0.05$) and satisfaction was higher in massage group in all the four phases ($p<0.001$). The massage group had lowered pain and anxiety in three phases in comparison with control group ($p<0.05$) Data analysis of satisfaction level was higher in massage group in four phases than control group ($p<0.001$). Duration of active phase was lower in massage group ($p<0.0001$). Finally the study concludes that massage is an effective alternative intervention, decreasing pain and anxiety and increasing satisfaction during labour.[7]

Nissi Mathew, Soney Neeraj Toppo et al conducted a quasi- experimental study with the purpose to assess the effectiveness of abdominal effleurage on labor pain intensity during first stage of labor among parturient mothers admitted in labor room at selected hospital of Indore. Two group pre test post test design was used for the study. Non probability purposive sampling technique was used to select 60 parturient mothers having 4-10 cm cervical dilation. Mainly 3 steps of abdominal effleurage were followed that are abdominal circles, side strokes and abdominal strokes. The observations were recorded immediately before the intervention and after the intervention. Data analysis reveal that there is no significant association between labor pain intensity and selected variables of control group as well as experimental group at the level of ≤ 0.05. Pain score was recorded by "Modified Fordyce Pain Scale" that revealed the significant effectiveness of abdominal effleurage on labor pain intensity. The statistical pain difference was computed by Mann Whitney U value ($p\leq 0.001$) as computed by SPSS 10. Ultimately the study concluded that abdominal effleurage is an effective nursing intervention for relieving pain in parturient mothers during first stage of labour.[8]

3. Materials & Method

This study was conducted in civil hospital, Ambala, Haryana, India.Civil Hospital is a 200 bedded hospital and situated in Ambala City. The hospital has OPD and wards like Medicine, Surgery, Obstetrics and Gynecology, Orthopedics, Pediatrics, Neonatal intensive care unit, Intensive care unit. Time series with multiple institution of treatment design was adopted for the study. Non probability purposive sampling technique was used to select the study subjects. Total 60 mothers were selected out of which 30 were in experimental and 30 were in comparison group. In view of the nature of the problem and to accomplish the objectives of the study, structured questionnaire was used to collect baseline data, Numeric pain intensity scale was used to assess the pain intensity level immediately before and after the abdominal effleurage and routine maternity care according to hospital protocol, Record analysis peroforma was used for assessing the fetal heart sound score and APGAR score at 5 minutes after birth. For no pain, score was 0 and for mild pain the pain score ranges between 1-3, for moderate pain 4-6, for severe pain 7-8 and for worst pain score ranges between 9-10. Validity was ensured by the experts in the field of Nursing and Medical departments. Reliability of the tools was 0.69 which was calculated by Cohen's kappa method of inter rater reliability Firstly experimental group mothers were given abdominal effleurage that was performed during contraction, which included abdominal circles, side strokes and abdominal strokes for thirty minutes for each intervention, for three times. 1st abdominal effleurage given for 30 minutes to mothers after first per vaginal examination who are in active phase of labor, 2nd abdominal effleurage was performed after 2 hours of the previous abdominal effleurage (irrespective of the cervical dilation) for 30 minutes and third intervention was given after 2 hours of the 2nd abdominal effleurage . Total six observations (O_1 to O_6 in experimental group and O_7 to O_{12} in comparison group) were recorded to assess the intensity of labour pain from both the groups each immediately before and after (during relaxation) the abdominal effleurage in experimental group and after routine maternity care in comparison group. Pain assessment was done through "Numeric pain intensity scale". Along with assessing the pain intensity of mother, Fetal Heart Sound was also recorded. The maximum pain rating score was 10. Pain scores ranges from 0-10 according to the severity of pain. Mothers were assessed for the parameters of Pain intensity, duration of labor, nature of delivery, fetal heart Sound, and APGAR score at 5 minutes of birth.

4. Results

For analysis and interpretation of the data descriptive and inferential statistics were used. Data analyzed for statistical significance using paired "t" test and hypotheses tested at 0.05 level of significance. Data analysis reveals that all (100%) the mothers in experimental and comparison group got the antenatal screening done. Majority (90%) of the experimental and comparison group mothers belong to age group 25-30 years. In experimental group 33% and in comparison group 30% mothers had only primary level of education. Majority (76.6%) of nulliparous mothers in experimental group and 73% mothers in comparison group

belong to Hindu religion. In experimental group 50% of nulliparous mothers and in comparison group 37% of mothers had monthly family income Rs. 10,000-15,000/- . All (100%) the mothers in experimental as well comparison group had height more than 145cm. Most of the (97%) experimental group and 100% of comparison group mothers had weight more than 60 kg. All (100%) nullipara mothers in experimental as well as in comparison group didn't report any history of substance abuse during pregnancy. Majority (90%) of experimental group and 93% comparison group mothers didn't not report any history of abortion. Majority (90%) of nullipara mothers in experimental group and 93% in comparison group having period of gestation between 37-40 weeks. All (100%) mothers of experimental and comparison group had done antenatal exercises in terms of daily walk, performing their household work like washing clothes, mopping dusting etc. Most (66.7%) of the nullipara mothers in experimental group and comparison group (90%) had been in labor since less than 4 hours respectively. Show was present in (97%) nullipara mothers in experimental and all (100%) in comparison group mothers. Majority (86.7%) of experimental group mothers and 80% of comparison group mothers were having bag of membrane intact.

Table 1: Mean, Mean Difference, Standard Error of Mean Difference and t- Value of Pre test Pain Intensity Score Among Nullipara Parturient Mothers in Experimental and Comparison Group, N=60

Group	Mean	M_D	SE_{MD}	t- Value	p- value
Experimental group (n=30)	4.17	-0.17	0.26	0.64 ^{NS}	0.52
Comparison group (n=30)	4.33				

t (58)= 1.98 *Significant (p<0.05)
NS- not significant

Data presented in Table 1 indicates that the mean pre test pain score was 4.17 in experimental group and 4.33 in comparison group with mean difference of -0.17. The computed 't' value was found to be statistically not significant (t=0.64, p=0.52) at 0.05 level of significance which shows that the difference in pain intensity score was not a true difference but by chance. Hence, it is inferred from the findings that both the groups were homogeneous in terms of pain score before initiation of intervention.

Table 2: Difference in Mean Pain Score in Experimental and Comparison Group,, N=60

GROUPS	PAIN SCORE, MEAN± SD						F Value	P value
	O1	**O2**	**O3**	**O4**	**O5**	**O6**		
Experimental Group	4.17±0.95	2.93±0.91	6.23±0.97	5.17±1.32	9.03± 0.67	8.83±0.70	**417.08**	**<0.001**
Comparision Group	4.33±1.06	3.80±1.215	7.13±0.9	7.07±0.98	9.23±.568	9.67±0.479	**456.57**	**<0.001**

General Linear model using repeated measures ANOVA was performed to evaluate the effectiveness of intervention on pain score. There was significant difference in pain score between observations within experimental and comparison group. The pain score was significantly increased from O1 to O6 in both the groups as it is related to the pain related to progress in labour. The increase in pain was compared between experimental and comparison group using Repeated measure ANOVA which revealed that the increase in pain in experimental group was significantly lesser than that of comparison group**.**

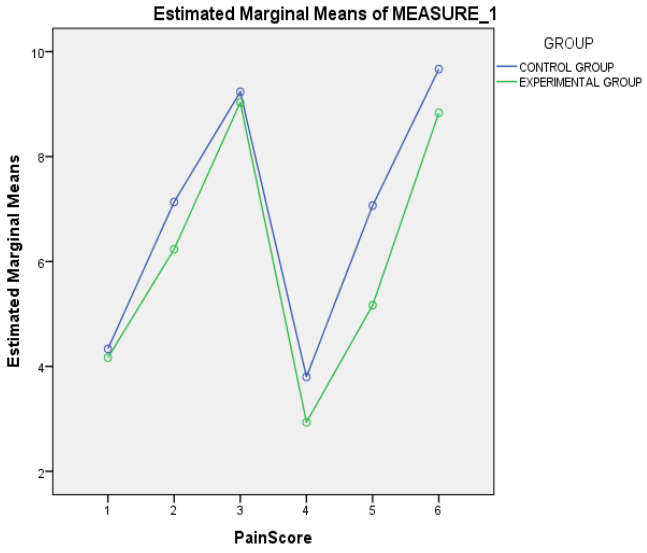

Figure 1 shows that there is continuous increase in labor pain intensity as the labor progresses in both the experimental and comparison group but the increase in labor pain intensity is less in experimental group than in comparison group.

Table 3: Comparison of Pain Score Within Subject Effect And Between Subject Effects As Computed By Repeated Measures ANOVA

Effect	Mean Square	Df	F	P	Greenhouse-Geisser
Time (pain score) (Within subject effect)	354.61	5	858.33	<0.001	<0.001
Time vs Group (Between subject effect)	5.96	5	14.42	<0.001	<0.001

Table No 3 shows that mean square between subject effect and with in subject effect were 354.61 and 5.96 respectively and F value comes out to be 858.33 and 14.42 respectively. The calculated F value is ia more than table value at 0.05 level of significance. Hence the score predicts that there was significant difference between pre and post intervention pain score in both experimental and comparison group. Hence the researcher rejects null hypothesis and accepted research hypothesis which indicate that reduction in pain score was not by chance but because of intervention. Therefore it can be concluded that abdominal effleurage was effective in reducing the pain intensity of laboring mothers more than the comparison group.

Table 4: Mean, Standard Deviation, Mean Difference, Standard Error of Mean Difference and "t" Value of Post test Fetal Heart Sound Score of Experimental and Comparison Group, N=60

Pain intensity score			Mean±SD	M_D	SE_{MD}	't' value
	E	Of_2	136.17±5.62			
	C	Of_8	137.53±6.10			
	E	Of_4	137.27±6.09			
	C	Of_{10}	136.87±6.40	0.40	1.61	0.25 NS
	E	Of_6	138.07±5.84			
	C	Of_{12}	137.73±6.64	0.34	1.61	0.20 NS

"t" (58)=1.98, NS- Not Significant, *- 0.05 level of significance

The data presented in table 4 revealed the comparison of post test and post routine maternity care fetal heart sound score (immediately after the first, second and third intervention) between the experimental and comparison groups. In the table mean, mean difference, SE_{MD} of fetal heart sound score of experimental group and comparison group are depicted. Mean of first post test fetal heart sound score (Of_2) of experimental group was (136.17) and of comparison group was (Of_8) 137.53 and the mean difference of fetal heart sound score was -1.33. This obtained difference was found to be statistically not significant with 't' value 0.88 at 0.05 level of significance. So the difference obtained was not a true difference but by chance. Further data shows the mean fetal heart sound score of third post test (Of_4) of experimental group was (137.27) and that of comparison group (Of_{10}) (136.87) and the mean difference of fetal heart sound score was 0.40. This obtained difference was found to be statistically not significant with 't' value of 0.25 at 0.05 level of significance. So the difference obtained was not a true difference but by chance.

Data in the table 15 further indicates that the mean fetal heart sound intensity score of fifth post test (Of_6) of experimental group was (138.07) and that of comparison group (Of_{12}) was (137.73) and the mean difference of fetal heart sound score was 1.61. This obtained difference was found to be statistically not significant with 't' value 0.20 at 0.05 level of significance. So the difference obtained was not a true difference but by chance. Hence research hypothesis H_5 is rejected and null hypothesis H_{05} is accepted which shows that the abdominal effleurage does not affect the fetal outcomes in terms of influencing the fetal heart sound.

Table 5: Difference in Mean Fetal Heart Rate in Experimental and Comparison Group, N=60

Groups	*Fetal Heart Rate , Mean± Sd*						F Value	P value
	O1	O2	O3	O4	O5	O6		
Experimental group	135.50±5.95	137.27±5.42	137.80±5.79	135.87±5.43	136.93±5.75	137.73±5.53	7.82	<0.001
Comparision group	134.97±4.51	135.67±4.49	136.60±4.37	136.47±4.41	136.07±5.11	136.93±4.19	2.97	0.03

General Linear model using repeated measures ANOVA was performed to evaluate the effectiveness of intervention on Fetal Heart Rate. There was significant difference in FHR score between observations within experimental and control group. The FHR was significantly increased from O_1 to O_6 in both the groups. The changes in FHR was compared between experimental and comparison group using Repeated measure ANOVA which revealed that there was no significant difference between experimental and comparison group in terms of changes in FHR from 0_1 to 0_6.

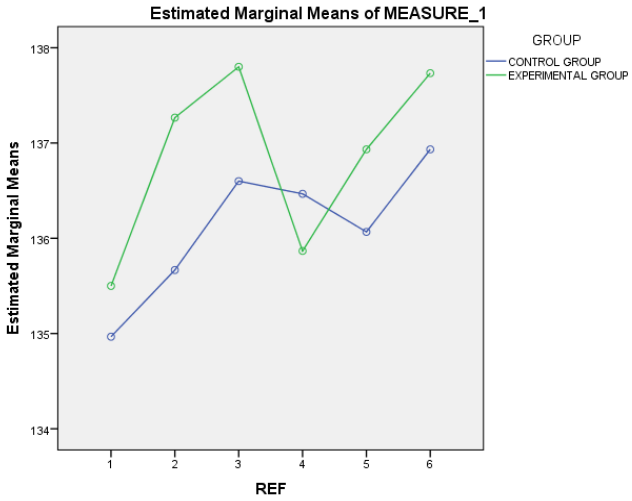

Figure 2 shows the significant difference in FHR score within experimental and comparison group. The FHR was significantly increased from O_1 to O_6 in both the groups. The changes in FHR was compared between experimental and comparison group using Repeated measure ANOVA which revealed that there was no significant difference

between experimental and comparison group in terms of changes in FHR from 0_1 to 0_6.

Table 6: Mean, Standard Deviation, Mean Difference and t value of APGAR Score of Newborns of Experimental and Comparison Group Mothers at 5 min after Birth, N=60

Groups	*Mean*	*SD*	*Mean difference*	*t value*	*P value*
Experimental group	9.37	0.718	0.1	0.53 NS	0.59
Comparison group	9.27	0.74			

"t" (28)=2.00, NS- Not Significant , * 0.05 level of significance

Data in the table 6 depicts the mean of APGAR score of experimental group was (9.37) and that of comparison group (9.27), the mean difference was 0.10. The calculated value 0.531 is not significant at 0.05 level of significance, so the difference obtained is not a true difference but by chance. Hence null hypothesis H_{06} is accepted and research hypothesis H_6 is rejected which indicates that abdominal effleurage does not have any significant influence on APGAR score of newborn at 5 minutes after birth**.**

5. Discussion

Findings of the study revealed that mean pain score of experimental group after administering abdominal effleurage were lower than the mean pain score of comparison group during all the post test observations. Hence it was evident from this study that abdominal effleurage was effective in reducing pain intensity during first stage of labor. These findings were consistent with the findings of the study conducted by **Nissi Mathew, Soney Neeraj Toppo et al**[8] with the purpose to assess the effectiveness of abdominal effleurage on labor pain intensity during first stage of labor among parturient mothers. Data analysis revealed the significant difference between the experimental and comparison groups and hence showed the effectiveness of abdominal effleurage on labor pain intensity.[42] This was also supported by another study conducted by **Mortazavi SH, Khaki S et al**[7] to assess the effects of massage therapy and presence of attendant on pain, anxiety and satisfaction levels during labor. Massage group had lowered pain intensity in second and third phases in comparison with attendant group. Another supportive evidence was obtained from the study conducted b **Isabelle Le Blanc-Louvry, Bruno Costaglioli et al**[9] to determine the effectiveness of mechanical abdominal massage on postoperative pain and ileus after colectomy. The results suggest that mechanical massage of the abdominal wall may decrease postoperative pain and ileus after colectomy

Present study reveals that significant difference in pain intensity score between experimental and comparison group was observed only during active phase not in transition phase. Another study to support the results of present study was conducted by **Chang MY, Chen CH, Huang KF et al**[10] to describe the characteristics of pain during labor with and without massage. The results of this study showed that massage lessened pain intensity at phase 1 and phase 2, but there were no significant differences between the groups at phase 3 (transition phase)[44.] One more study consistent with the findings of this study was conducted by **Mei-Yueh Chang, Shing-Yaw Wang et al**[11] which showed the effects of massage on pain and anxiety during labour. As a result, In both groups, there was a relatively steady increase in pain intensity and anxiety level as labour progressed, the experimental group had significantly lower pain intensity in the latent and active phase but no significant difference was obtained during transitional phase.

Further findings of the present study revealed that there was significant association between the labour pain intensity score and the selected demographic variables that were in contrast to the findings of **B Jaya Bharthi**[12] and **Nissi Mathew, Soney Neeraj Toppo et al** [8]which showed that there is no significant association between labor pain intensity and selected variables of control group as well as experimental group.

At the same time this study differs from previous studies in the sense that this study enriched the data by assessing the fetal outcomes also whereas most of the previous studies have analyzed only the effectiveness of massage on pain, anxiety and satisfaction level in parturient mothers during labor. However no significant results were obtained regarding the fetal outcomes but this study is unique in this aspect.

6. Conclusion

The main aim of the study was to assess and compare the labor pain intensity and labor outcomes among nullipara parturient mothers during first stage of labor. The findings of the study revealed that abdominal effleurage was effective for reducing labor pain intensity during active phase and no significant difference was observed. The findings of the study have several implications for nursing service, education, administration and research.

7. Future Scope

Staff nurses working in antenatal ward and labor room as well as patient's attendants need to include in practice the administration of abdominal effleurage to relieve pain up to some extent to intranatal mothers. The result of the study emphasized the need for correlating the concepts in order to understand and advice on using abdominal effleurage for mothers in labor in terms of reducing the intensity of pain. Thus the nurses who follow these measures in a holistic manner will be able to provide comprehensive care to clients. The midwifery students should be given an opportunity to learn the strokes of abdominal effleurage technique for the mothers in labor to reduce the intensity of pain. The findings of the study could also be used by District Community health nurse in order to sensitize the other health care workers dealing directly with intranatal care in community regarding improvement in positive outcomes of delivery.

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