

## Effect of Ice Compression on Hand and Sacrum Region in Parturient Women for Reducing Labor Pain

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### Abstract

**The aim** of this study was to evaluate the effect of ice compression on hand and sacrum region in parturient women to reduce labor pain. **Subjects and methods: research design:** Quasi Experimental design was used to conduct this study. **Settings:** The study was conducted on labor and delivery unit at the ElGlaa Maternity Hospital. **Sampling technique:** purposive sampling technique was used in collecting the data, total sample of One hundred and fifty (150) parturient women according equation of a 25% of the annual flow rate of primipara of normal vaginal delivery admitted in the hospital in 2017. **Tools of data collection was collected through three tools: The first tool** was a self-structured interviewing questionnaire that was designed by the researcher 20 multiple choice questions (MCQ). It represents general characteristics of studied groups, assessment of current Obstetrical history. **The second tool Labor Progress Record (Partograph, WHO, 2018), it was used to assess labor progress** Which includes, **Fetal condition, Labor progress and Maternal condition. The third tool Modified version of visual analogue scale (VAS)** is adopted from *Bird, Callisaya, Cannell, et al. (2016)* to assess severity of pain and consisted of a blank line (10 cm) anchored at each end of the line by adjectives that describe the extremes of pain corresponding to cervical dilatation. **Results:** The study revealed that there is slight reduce pain among the studied group more than the control group especially in hand group decrease in pain intensity. **Conclusion:** Ice cold compression reduce labor pain, but hand group had more persistent slight effects on pain intensity, in spite of slight increasing of contraction frequency in the study group than control group. **Recommendation's:** Providing continuing educational programs for nurses about the benefits of ice cold compression and continuous education about how to use it probably.

**Keywords:** Ice cold compression, parturient women.

### Introduction

Childbirth is likely to be one of the most painful events for women during their lifetime. Labor pain is due to the stimulation of nerve receptors, followed by uterine muscle contractions, and is felt in the lumbosacral, hip, and gut areas. The pain can be severe and prolonged and it might lead to confusion and loss of confidence among women. Labor pain causes an increase in epinephrine and norepinephrine levels, which increases the blood pressure, heart rate, and oxygen consumption in women. In addition,

vasoconstriction induced by catecholamine leads to a decrease in uterine blood flow, which directly increases the prevalence of dystocia and decreases the neonatal Apgar score (*Fahimeh et al., 2017*).

Labor pain is the most acute pain of a human body. It is similar to other types of visceral pain severe, colicky, and intermittent). In contrast to many other sources of pain, is not a pathological case, but a part of a normal physiological process. In the first stage of birth, it is caused by uterine contractions and dilatation of cervix to allow the exit of the fetus. In the second stage of labor, the

pain is caused by the pressure of the pelvic and the distension of enclosing structures (**Santana et al., 2016**).

The labor pain is influenced not only by the physiological and anatomical factors, but also by psychological and socio-cultural implications of three delivery positions on pain intensity during the active phase of labor to try to reduce labor pain for the parturient women (**Valiani, Rezaie, and Shahshahan, 2016**).

Management of labor pain can be divided into two categories: pharmacological and non-pharmacological. Pharmacological measures include the administration of analgesic drugs and regional anesthesia, but these measures have side effects on the mother, such as decrease in heart rate, hypotension, and vertigo, and adverse effects on the fetus that can cause respiratory suppression and diminish the suckling reflex early after birth (**National Institute for Health and Clinical Excellence (NICE), 2018**).

In contrast, non-pharmacological pain measures such as cold compression, aromatherapy, and acupressure are examples of non-pharmacological methods that not only relieve pain but also relieve fear, anxiety, and drug requirement. In addition, non-pharmacological methods for reducing labor pain are superior to pharmacological methods because of ease of implementation, noninvasiveness, ability to build confidence and increase patient participation, absence of adverse impact on the delivery process, and lack of side effects on the mother and the fetus (**Salehian & Safdari, 2015**).

### **Significance of the study:**

Labor pain and unrelieved pain can have an adverse effect on the physiological and psychological well-being of laboring women. In Egypt, there are few studies examining the effect of noninvasive method to relieve labor pain. To date, labor pain management has focused on the use of drugs that affect the sensory awareness of pain, which may have an additional effect of impeding a woman's active participation in giving birth. Also, not all nurses believe in the use of complementary and

alternative approaches to provide relief from labor pain.

Cold application is simple, cheap, non-pharmacological anxiety and pain management strategy ensuring good results. Furthermore. When cold is applied to the body it causes an initial decrease in blood flow due to the vasoconstriction of the cutaneous blood vessels. This vasoconstriction persists if the duration of the cold application is limited to less than 15-20 minutes. Direct effects: increase viscosity of the blood that results in decrease blood flow and vasoconstriction (**Raju & Singh, 2015**).

Nurses pay a little attention to manage labor pain and they go about their routine nursing care as hourly vital signs assessment and hourly fetal heart rate monitoring without attention to labor pain. They see labor pain as natural phenomena occur to each woman. Although previous studies have investigated individual noninvasive pain relief approaches, to date there is scattered studies have compared several non-pharmacological methods simultaneously (**Cho, 2017**).

Massage by ice on the hands as a type of noninvasive modality is effective in shortening the duration of the active phase of labor. The findings of the present study are applicable in nursing practice for laboring mothers to promote comfort by reducing the labor pain intensity. Large intestine (4) is a point where the energy flow of the meridian is close to the skin and can be easily stimulated with pressure, needles, and extreme cold. massage has been shown to be an effective measure and can be used in clinical practice to improve the quality of care in labor and delivery. Large intestine (4) massage with ice can be used as an alternative predominantly in early labor when resources are limited. Ice-cold massage could be an important option for women with labor pain (**Fawaz and El-Sharkawy, 2016**).

### **Aim of the study**

This study aims to evaluate the effect of ice compression on hand and sacrum region in parturient women for reducing labor pain.

### Research hypothesis

Laboring women who receive ice cold compression applied to their hand and sacrum regions will experience less pain score than control group who are not receive ice cold compression in any area of them.

### Subjects and Methods

#### Research design:

Quasi Experimental design will be used to conduct this study.

#### Research setting:

The study was conducted at labor and delivery unit at the El Glaa Maternity Hospital.

#### Sample type and size:

It is purposive sampling technique was used in collecting the data, total sample of One hundred and fifty (150) parturient women according equation of a 25% of the annual flow rate of primipara of normal vaginal delivery admitted in the hospital in 2017.

#### Criteria of the study:

Parturient women were selected in the current study according to the following **inclusion criteria:**

- Primipara.
- In normal pregnancy (single and mature fetus).
- Free from medical, gynecological and obstetric risks.
- Active phase of 1<sup>st</sup> stage of labor on 4 cm cervical dilatation at least.

#### Exclusion criteria are:

- Women which received pain relief drugs.
- Women who had previous problems in the hand or sacrum region.
- Women who receive oxytocin for augmentation of labor.

#### Tools of data collection:

Three Tools of data collection used in this study were consisted of:

#### Tools of data collection (A ppendix I):

#### 1) A Self-Structured Interviewing Questionnaire Sheet:

It was developed by the researcher based on reviewing of literatures considering the aim of the study and opinions of expertise for the content of validity.

The questionnaire sheet was constructed in the form of multiple choice questions (MCQ) and the total number of questions was (20) questions, this sheet included three parts divided as follows:-

**1<sup>st</sup>Part:** It represents general characteristics of studied sample such as, age, place of residence, educational level and occupation. (Q1-4)

**2<sup>nd</sup> part:** it designed to assess current pregnancy history It included 12 questions concerned with the assessment of Obstetrical history, such as, mode of previous delivery (normal vaginal delivery or vaginal delivery with episiotomy),gestationalage, complication of the current pregnancy, taking medication to increase uterine contraction or not. (Q5-17)

**3<sup>rd</sup>Part:** It included 3 questions concerned with the assessment of medical and surgical history such as any chronic diseases like, diabetes, liver, kidney, heart, and their medication) and surgical operation before to identify the exclusion criteria of the studied sample.(Q18-20)

#### 2) Labor Progress Record (Partograph WHO, 2018), it was used to assess labor progress.

Which includes three main sections:

##### a) Fetal condition:

Fetal condition includes fetal heart rate, color of liquor, degree of molding and **APGAR SCORE** which obtained adding pointes (0, 1 or 2) for heart rate, respiratory effort, muscle tone, response to stimulation and skin coloration.

##### ❖ Scoring system

- <4 indicate severe asphyxia.
- 4-6 indicate moderate asphyxia.
- 7-10 indicate good condition.

##### b) Labor progress:

The progress of labor includes cervical dilatation which measured from 30 minutes to

one hour. Descent of the head we can measure it also in the same time of measuring cervical dilatation It helps the doctors to evaluate how labor is progressing, we called it as a Station it is the measurement of the baby relative to the ischial spines and its started in the active phase by (-1) that's mean before the head reaching the ischial spines, and uterine contraction.

### c) Maternal condition

The maternal condition includes blood pressure, pulse, temperature, and respiration.

### 3) Modified version of visual analogue scale:

The visual analogue scale (VAS) is adopted from **Bird, Callisaya, Cannell, et al. (2016)** to assess severity of pain and consisted of a blank line (10 cm) anchored at each end of the line by adjectives that describe the extremes of pain corresponding cervical dilatation.

#### ❖ Scoring:

- (0) Indicate no pain.
- (1\_3) mild pain.
- (4\_7) moderate pain.
- (8\_9) sever pain.
- (10) Is top score which indicates the worst possible pain.

These scores will be recorded every 30 minutes for 2 groups.

### The VAS with cervical dilatation was divided into 3 main parts:

- **Part one:** Graded from 1-3 cm cervical dilatation which reflect mild pain.
- **Second part:** graded from 4- 7 cm cervical dilatation for moderate pain.
- **Third part:** graded from 8-10 cm cervical dilatation for severe pain.

In order to be easily understood by the laboring women and achieved accurate scoring, the scale was categories (green, orange, red) mild, moderate and sever respectively.

### Tools validity and reliability

**Testing validity** of the proposed tools by using face and content validity. **Face validity** aimed to inspect the items to determine whether the tools measure what supposed to measure. **Content validity** was conduct to determine

whether the tools cover the aim. Validity was tested by a jury of (5) experts: in the field of maternity and neonatal nursing department, Ain shams University; (2) professors, (3) Assistant professors of maternity and neonatal Nursing at Faculty of Nursing Ain shams university.

The experts reviewed the tool for clarity of sentences, consistency, appropriateness of content, sequence of items, accuracy, relevance, comprehensiveness, simplicity and applicability of tool; minor modification done. Finally, the final forms were developed.

**Testing reliability** of proposed tools was done by alpha Cronbach's test. It was used to examine whether the questionnaire had internal consistency; the tool had a good internal consistency indicating acceptable reliability.

### I) Operational design

Operational design included preparatory phase, validity, and reliability of the developed tools, pilot study, field work and limitation of study.

#### Preparatory phase:

It was the first phase of the study and included reviewing current and past, local and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines. This helped the researcher to be acquainted with the magnitude of the problem and guided to prepare the required data collection tools.

#### Pilot study:

A pilot study was carried out with 10% (15women) of the total study sample at the previously mentioned settings to test the study tools for its clarity, validity and time required to fill the tools. The necessary modifications were done through omission of unneeded or repeated questions and improved prior to data collection according to the pilot study results. Women included in the pilot study were excluded from the study subjects.

#### Field work:

An official permission was obtained to conduct the study. The researcher held a meeting with the women in hospital to introduce her-self and briefly explained the nature and the

purpose of the study to the approached one who full fill the inclusion criteria in the sample all women informed that their participation was voluntary.

The data collected at delivery unite of the El Glaa Maternity Hospital as the researcher attended at the previous setting for 4 days /week(Saturday, Sunday, Monday, Tuesday) from 9:00am to 01:00pm for 4 months, from July 2018 to October 2018 (because of the availability of the researcher in this time), the women's approval obtained orally to participate in the study after that the aim of the study explained to them, the sample size are One hundred and fifty parturient women, divided into three groups, hand cold compression 50 participants, sacrum compression 50 participants. Control group 50, First group exposed to ice cold compression on hand, a second group exposed to ice cold compression in sacrum region, third group controlled group.

The data of the study were collected by using the previous mentioned tool like, interviewing questioner, partograph record& Visual analogue scale started to fill in active phase, first stage of labor (in pre labor room) and will continue to measure the progress of labor & the intensity of pain (in active phase) in delivery room to evaluate the effect of cold compression on hand for first group and ice compression on sacrum region 2<sup>nd</sup> group comparing with the 3<sup>rd</sup> group (controlled group)and all of this toll written in English and filled by the researcher.

#### **Ethical consideration**

The ethical research considerations in this study included the following:

- The approval was obtained from the Scientific Research Ethical Committee in the faculty of Nursing at Ain Shams University before starting the study.
- Needed permissions were obtained through the appropriate channels.
- The researcher clarified the objectives and the aim of the study to the students included in the study.

- The researcher assured maintaining anonymity and confidentiality of the women data.
- The participant women had the right to withdraw from the study at any time.

There was no harm occurred to the participant women.

#### **Implementation phase**

At this phase the researcher assess the severity of base pain through assessment of contraction to measures frequency, duration and intensity using visual analogue scale (VAS), for three (studied groups and control group) then the severity of pain re- measured through visual analogue scale (VAS) and contraction assessment tool at the time of cervical dilation for hand group (group 2) (right and left hand) crushed ice was twisted. In terry bag was rocked over the area of the web of skin between the thumb and the fore finger. The compression was carried out in hoku point through the contraction from 5 to 20 minutes. For the third group the researcher assesses the severity of pain when ice bag was rocked over the sacrum area of the mother's back.

#### **Evaluation phase**

The researchers evaluated the effect of ice compression on reducing intensity of labor pain using VAS scale and compairing pain (severity, duration and frequency of contraction) and progress of labor between control and studied groups.

#### **II) Administrative design:**

Official letters for data collection were obtained from the Dean of the Faculty of Nursing, Ain Shams University to the manager of the laboring room of El- Galaa Maternity hospital. This letter will include the aim of the study and photocopy from data collection tools in order to get the permission and help for collection of data.

#### **III) Statistical Design:**

All data were collected, entry, organized, categorized, and analyzed through computer using the statistical package for social science (SPSS) tabulated and subjected to statistical

analysis, also Microsoft office excel is used for data handling and graphic presentation. Quantitative variables are described by the mean, standard deviation (SD), and rang.

- Data were presented using descriptive statistics in the form of number and percentage, distribution of qualitative variable as mean, standard deviation (SD), rang, Chi-square (X<sup>2</sup>) and (p- value) test were also used to test of significance (the relation between qualitative variable) and regarding significance of result, the observed difference and associations were considered as follows:

- $p > 0.05$  not significant (NS)
- $p < 0.05$  significant (S)
- $p < 0.01$  highly significant (S)

#### Limitation of the study:

- Twelve women were not motivated to complete the study after making an explanation of the study so, the researcher excluded them from the study and replaced by others to complete the required sample size.

#### Result:

**Table (1):** clarifies that regarding age 44%, 48% and 36% of the ice compression on hand, ice compression on sacrum and control group their age ranged between (20-24) years old respectively with mean age ( $21.16 \pm 0.71$ ), ( $21.36 \pm 0.15$ ) and ( $21.43 \pm 0.91$ ). According to residence area respectively; 64%, 52% and 58%. From rural area to the three groups hand, sacrum and control groups, according to level of education about half of the studied group and the control group moderate education. According to the occupation of the hand group, sacrum group and control group around two third of them working.

**Table (2)** represent that normal vaginal delivery (68%, 58% and 40%) respectively in the hand group, sacrum group and control group. In relation to gestational age of the three groups were between (38-40 wks) with mean

( $39.82 \pm 0.43$ ,  $40.67 \pm 0.43$  and  $40.23 \pm 0.52$ ) respectively of hand, sacrum and control group. Regarding to the fetal expected weight of the three groups ice compression on hand group, ice compression on sacrum group and control group were between with mean of ( $2.46 \pm 0.43$ ,  $2.97 \pm 0.65$  &  $2.41 \pm 0.87$ ).

**Table (3)** indicates that there was highly statistical significant difference ( $p < 0.001^{**}$ ) in the mean of intensity of uterine contraction the three groups after assuming the ice compression for the studied groups as **After five hours:** minimal decreasing of pain between control and studied groups, but forty one parturient women and thirty eight parturient women in the ice compression on hand group and ice compression on sacrum region respectively delivered compared to six parturient women only in the control group.

**Table (4):** reveals that there was a statistical significant difference ( $p$  less than  $0.05^*$ ) in spite of slight increasing of frequency of contraction in the study group more than control group.

**Table (5):** This table shows that after five hours assuming ice compression on hand, sacrum region the cervical dilatation was ( $8.45 \pm 0.98$  &  $8.01 \pm 0.16$ ) compared to control group ( $7.99 \pm 0.51$ ). There was a progression in cervical dilatation times among studied groups and control group, and there was a highly statistical significant ( $^{**} < 0.0001^{**}$ ) between studied groups and control group.

**Table (6):** shows that there was decreasing in the uterine contraction intervals and a highly statistical significant difference ( $P < 0.001$ ) in the mean interval of uterine contractions between the hand, sacrum groups and the control group, ( $2.32 \pm 0.47$ ,  $2.74 \pm 0.51$  and  $2.97 \pm 0.60$ ) respectively.

**Table (7):** reveals that all the studied groups had normal fetal heart rate, in spite of there is slight increased in the studied group than the control group but all within normal.

**Table (1):** Distribution of Number and Percentage of the Studied Groups in Relation to Their General Characteristics (N=150).

Items	G1 (n=50)		G2 (n=50)		G3 (n=50)	
	No	%	No	%	No	%
<b>Age (in years):</b>						
20 -	22	44	24	48	18	36
25-	12	24	16	32	17	34
30 -37	16	32	10	20	15	30
<b>Mean ± SD</b>	21.16 ± 0.71		21.36 ± 0.15		21.43 ± 0.91	
<b>Residence:</b>						
Urban area	18	36	24	48	21	42
Rural area	32	64	26	52	29	58
<b>Education:</b>						
Read and write	6	12	6	12	4	8
Moderate education	24	48	27	54	29	58
High education	18	36	17	34	17	34
<b>Occupation:</b>						
Working	38	76	36	72	33	66
House wife	12	24	14	28	17	34

G1: Ice Compression on Hand Group, G2: Compression on Sacrum Group, G3: Control Group

**Table (2):** Distribution of Number and Percentage of the Studied Groups According to their Current Obstetrics Findings on Admission (n=150)

Items	G1 (n=50)		G2 (n=50)		G3 (n=50)	
	No	%	No	%	No	%
<b>Regular contraction</b>						
No	0	0.0	1	2	4	8
Yes	50	100	49	98	46	92
<b>Gestational age( in week)</b>						
38-	32	64	33	66	31	62
41-42	18	36	17	34	19	38
<b>Mean ± SD</b>	39.82 ± 0.43		40.67 ± 0.43		40.23 ± 0.52	
<b>Mode of delivery</b>						
Normal vaginal delivery	34	68	29	58	20	40
Normal vaginal delivery with episiotomy	16	32	21	42	30	60
<b>Fetal expected weight (kg)</b>						
<b>Mean ± SD</b>	2.46 ± 0.43		2.97 ± 0.65		2.41 ± 0.87	

G1: Ice Compression on Hand Group, G2: Compression on Sacrum Group, G3: Control Group

**Table (3):** Distribution of the mean score of pain intensity level of ice compression in the studied groups (N=150).

Pain Intensity	No.	G1 (n=50)		G2 (n=50)		G3 (n=50)		F	P Value
		Mean± SD	No.	Mean± SD	No.	Mean± SD	No.		
<b>Before application</b>	50	4.87±0.28	50	4.91±0.94	50	4.97±0.47	0.32	0.72	
<b>1<sup>st</sup> hour of application</b>	50	5.66±0.87	50	5.78±0.94	50	6.81±0.16	7.53	<b>**0.001</b>	
<b>2<sup>nd</sup> hour of application</b>	50	6.51±0.16	50	6.72 ±0.27	50	7.25 ±1.15	15.35	<b>**0.0001</b>	
<b>3<sup>rd</sup> hour of application</b>	50	7.22 ±1.17	50	7.47 ± 1.21	50	8.08 ±1.26	6.64	<b>**0.002</b>	
<b>4<sup>th</sup> hour of application</b>	50	8.31 ±1.02	50	8.53 ± 1.26	50	9.02 ±0.37	6.05	<b>**0.003</b>	
<b>5<sup>th</sup> hour of application</b>	9	8.87 ± 0.77	12	8.94 ±0.51	44	9.27 ±0.20	7.66	<b>**0.001</b>	
<b>Total mean score of pain intensity level</b>		6.91±0.70		7.05±0.85		7.56±0.61	11.08	<b>**0.0001</b>	

G1: Ice Compression on Hand Group, G2: Compression on Sacrum Group, G3: Control Group

\*None significant&lt; 0.05 \*\*A Highly statistical significant &lt; 0.001

**Table (4):** Frequency means score of uterine contraction in active phase of the study sample groups (n=150).

Frequency of uterine contraction in active phase(10 min)	No.	G1	No.	G2	No.	G3	F	P Value
		(n=50) Mean± SD		(n=50) Mean± SD		(n=50) Mean± SD		
1 <sup>st</sup> hour	50	3.32±0.19	50	3.24±0.16	50	3.13±0.17	15.06	**0.0001
2 <sup>nd</sup> hour	50	3.77±0.51	50	3.63±0.41	50	3.38±0.34	10.76	**0.0001
3 <sup>rd</sup> hour	50	3.80±0.45	50	3.41±0.67	50	3.70±0.08	9.35	**0.0001
4 <sup>th</sup> hour	50	4.17±0.22	50	4.10±0.24	50	4.00±0.23	6.89	**0.001
5 <sup>th</sup> hour	9	4.27±0.28	12	4.23±0.32	44	4.15±0.27	4.07	*0.02
<b>Total mean score of uterine contraction in active phase</b>		3.87±0.33		3.72±0.36		3.67±0.22	5.66	0.004

G1: Ice Compression on Hand Group, G2: Compression on Sacrum Group, G3: Control Group

\*None significant >.05 \*A statical significant P< 0.05.

\*\*A Highly statical significant< 0.001

**Table (5):** Distribution of The Studied Sample Groups and Control Group According to The Mean Cervical Dilatation Progress Across the Time(n=150).

Cervical dilatation progress (cm/hr.)	No.	G1	No.	G2	No.	G3	F	P Value
		(n=50) Mean± SD		(n=50) Mean± SD		(n=50) Mean± SD		
After 1 <sup>st</sup> hour	50	4.35±0.47	50	4.21±0.09	50	4.00±0.10	19.47	**0.0001
After 2 <sup>nd</sup> hour	50	5.17±0.13	50	5.11±0.15	50	4.96±0.30	13.56	**0.0001
After 3 <sup>rd</sup> hour	50	6.19±0.38	50	6.14±0.39	50	5.73±0.52	16.85	**0.0001
After 4 <sup>th</sup> hour	50	7.11±0.86	50	7.03±0.91	50	6.53±0.51	8.11	**0.0001
After 5 <sup>th</sup> hour	9	8.45±0.98	12	8.01±0.16	44	7.99±0.51	8.13	**0.0001
<b>Total mean score of cervical dilatation progress</b>		6.25±0.56		6.01±0.34		5.84±0.39	10.95	**0.0001

G1: Ice Compression on Hand Group, G2: Compression on Sacrum Group, G3: Control Group

\*A statical significant P< 0.05. \*\*A highly statical significant<0.001

**Table (6):** Distribution of the Studied Groups and Control Group According to The Mean of Interval of Uterine Contraction Across TheTime (n=150)

Interval of uterine contractions(min)	No.	G1	No.	G2	No.	G3	F	P Value
		(n=50) Mean± SD		(n=50) Mean± SD		(n=50) Mean± SD		
Before application	50	4.12±0.78	50	4.19±0.94	50	4.24±0.57	0.32	0.72
1 <sup>st</sup> hour of application	50	5.26±0.87	50	5.78±0.94	50	5.38±0.81	7.53	**0.001
2 <sup>nd</sup> hour of application	50	3.51±0.505	50	3.72 ±0.57	50	4.00 ±.70	15.35	**0.0001
3 <sup>rd</sup> hour of application	50	2.72 ±0.76	50	3.26 ±.51	50	3.56 ±.61	6.64	**0.002
4 <sup>th</sup> hour of application	50	2.51 ±.50	50	3.00 ±.46	50	3.24 ±0.47	6.05	**0.003
5 <sup>th</sup> hour of application	9	2.32 ± 0.47	12	2.74 ±0.51	44	2.97 ±0.60	7.66	**0.001

G1: Ice Compression on Hand Group, G2: Compression on Sacrum Group, G3: Control Group

\*A statical significant P< 0.05. \*\*A Highly statical significant<0.001

**Table (7):** Distribution of the studied according to the mean of fetal heart rate monitoring during active phase of first stage of labor (N=150).

Fetal heart rate	G1 (n=50)		G2 (n=50)		G3 (n=50)	
	No.	Mean± SD	No.	Mean± SD	No.	Mean± SD
Before application	50	124.50±10.85	50	126.30±13.08	50	124.97±10.47
1 <sup>st</sup> hour of application	50	134.66±11.95	50	136.48±14.24	50	134.81±12.16
2 <sup>nd</sup> hour of application	50	142.51±9.60	50	138.07 ±12.57	50	137.25 ±13.15
3 <sup>rd</sup> hour of application	50	148.22 ±6.37	50	146.47 ± 9.81	50	138.08 ±12.26
4 <sup>th</sup> hour of application	50	152.31 ±11.32	50	146.13 ± 11.46	50	144.02 ±9.3.37
5 <sup>th</sup> hour of application	9	154.87 ±11.87	12	150.24 ±12.51	44	146.27 ±11.20

G1: Ice Compression on Hand Group, G2: Compression on Sacrum Group, G3: Control Group

## Discussion

This study aimed to evaluate the effect of ice compression on hand and sacrum region in parturient women for reducing labor pain at labor and delivery unit at El Glaa Maternity Hospital, Egypt.

Regarding general characteristics of the study sample age; The present study clarified that almost half of parturient women's age of both studied group were in age (20-24 yrs) with a mean age of (21.36 ± 0.15). this might be due to common marriage age in the studied society culture, this result is in conformity with *Rahimikian et al. (2018)* who studied the effects of ice pack application on pain intensity in the active phase of labor and on birth satisfaction among primiparous women, Iran, and found that (54.5%) of intervention group were age ≤24 yrs, on other hand this result contradicted with *Shirvani & Ganji, (2014)* who studied the influence of cold pack on labour pain relief and birth outcomes: a randomized controlled trial, Iran and reported that mean and SD of cold pack group were 28.53± 5.41.

As regards of parity and current pregnancy of the studied samples, the current study clarified that all the studied group primipara. This result matched with *Abdel Ghani & Berggren, (2014)* who studied Parturient Needs during Labor: Egyptian Women's Perspective toward Childbirth Experience, In relation to gestational age of the three groups was (38-40 wks), this result

congruent with *Yazdkhasti, Hanjani & Tourzani, (2018)*

According to fetal expected weight, the present study revealed that fetal expected weight of the hand group, sacrum group and control group were with mean (2.46±0.43, 2.97±0.65 and 2.41±0.87) respectively as well as this result contradicted with *Shirvani & Ganji, (2014)* as reported that mean and SD of neonatal weight of both studied and control group were 3387.5±247.24 & 3390.6±237.40 gm some women from thinking of labor pain doesn't like to eat to bring small baby to not suffer in delivery process.

There was highly statistical significant difference (p 0.001\*\*) in the mean of intensity of uterine contraction the three groups after assuming the ice compression for the studied groups as minimal decreasing of pain between control and studied groups, but forty one parturient women and thirty eight parturient women in the ice compression on hand group and ice compression on sacrum region respectively delivered compared to six parturient women only in the control group (*Al-Battawi, Mahmoud, and Essa, 2018*).

Non-pharmacologic measures of pain relief which include: physical or psychological activities that divert the mother concentration away from pain. These therapies are preferred over pharmacological methods because they are non-invasive, minimize complications for mother or fetus, provide support and enhance the satisfaction cooperation among mothers and their therapists (*Chaillet et al., 2017*).

Non-pharmacological strategies include: therapeutic touch; walking; application of heat and cold compresses; transcutaneous electrical nerve stimulation (TENS); breathing techniques; imagery; acupuncture; acupressure; homoeopathy; reflexology and ice application. Ice application or cooling has been advocated as an effective, safe and non-invasive adjuvant means of providing pain relief during the first stage of labor (*Williams & Mitchell, 2016*).

Regarding progress of labor, the present study revealed improvement in labor progression in the ice compression on hand group followed by ice compression on sacrum group regarding the frequency and duration of uterine contraction, this result is supported by *Fawaz & El-Sharkawy, (2016)* who studied effect of LI4 (Hoku point) massage with ice on labor duration during the active phase of labor among women delivering at El Manial University Maternity Hospital, Egypt, and found that the duration of the active phase (4 cm dilatation to full dilatation) was shorter in the study group compared with the control group.

Concerning cervical dilatation progress of the study sample group's present study revealed that, after five hours assuming ice compression on hand, sacrum region was ( $8.45 \pm 0.98$  &  $8.01 \pm 0.16$ ) compared to control group ( $7.99 \pm 0.51$ ). There was a progression in cervical dilatation times among studied groups and control group, and there was A Highly statical significant (\*\* $<0.0001$ \*\*) between studied groups and control group. this result is similar a study carried out by *Fawaz & El-Sharkawy, (2016)* and reported that studied group appear more cervical dilatation compared to control group, there was a statistically significant difference between the two groups over time in terms of cervical dilatation.

Concerning duration of labor, the current study revealed that women in both ice compression on hand and ice compression on sacrum groups had shorter duration of first stages of labor than women in the control group, The possible explanation for the shorter duration was offered by *Holey & Cook, (2011)*.

Concerning mother's satisfaction about ice cold compression intervention, the current study revealed that, group with ice cold compression on hand were more satisfied than sacrum group, there was statistical difference between ice compression on hand groups and sacrum group. This result in similar a study carried out by *Al-Battawi, J.I., Mahmoud, N.M. and Essa, R.M.(2018)*: As reported that mother had moderate satisfaction level with their labor pain intervention in favor of the study group (37%). Also *Abdel Ghani, (2014)* reported significantly greater birth satisfaction in the intervention group of the study.

### Conclusion

Based on the results of the present study, it can be concluded that:

- Ice compression slightly decrease labor pain intensity and duration, but hand group had more persistent effects on pain reduction than ice compression on sacrum group.

### Recommendations

In the light of the results of the present study, the following recommendations are suggested:

Providing continuing educational programs for nurses about the benefits of ice cold compression and continuous education about how to use it probably.

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