To assess the effects of Kinesio-tape on surgical incisions in subjects with lower abdominal surgery.

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Purpose: Several studies in physiotherapy using kinesio-tape are available to prevent and cure the musculoskeletal and neurological disorders in patients. However, few studies are available for using Kinesio-tape in abdominal surgery patients. Therefore, the main objective is to assess the effect of Kinesio-tape on surgical incisions in subjects with lower abdominal surgery. The secondary objectives are to assess the effectiveness of Kinesio-taping in improving patient outcomes in form of pain relief, ambulation and to determine the level of prescribing of Kinesio-taping immediately after abdominal surgery.

Participants: Total 22 participants with age between 25years to 50 years old both males and females underwent lower abdominal surgery allocated randomly.

Methods: The participants were divided into two groups: Control group received conventional treatment and experimental group received conventional treatment and Kinesio-taping. Following assessment tool was used as outcome measure in both the groups and was administered 4 hours of surgery. Documenting Surgical Incision Site Care (DSISC) and Visual Analogue Scale (VAS). Outcome measures were assessed post conventional treatment and Kinesio tape application in control and experimental group.

Results: Descriptive statistics and data was analysed on SPSS by adopting proper statistical tests. There was significant difference found between control and experimental group in pain, however, no significant difference found on surgical incision site.

Conclusion: There was faster recovery with kinesio-tape application in pain with lower abdominal surgery subjects. There was no obvious changes seen on surgical incision site.

Implications: It is recommended to apply kinesio-tape with physiotherapy in post abdominal surgery to relieve pain. Thus reducing the dose of analgesics.

Key words: Kinesio-tape, Surgical incisions, Abdominal surgery

INTRODUCTION:

Abdominal surgery consists of disease processes of various etio-pathology and may responsible to cause postoperative complications. The complications which occurs after surgical operations is connected with malfunction or failure of the alimentary canal. This malfunction may be the cause of flatulence and oedema of the stomach cover, which leads to pain. The other possible reason for post surgical complication is post-operative immobilization which is caused by hypokinesis[1].

Physiotherapy in patients after surgeries should lead to the fastest possible mobilization of the patient and the time of recovery and return to normal physical activity depends on the extent of surgical operation and patient's condition.

The advanced technique known as kinesio-taping in post abdominal surgery suggest its usefulness for treatment of pain, accelerating post-operative wound healing processes. It is a therapeutic technique which was developed by Dr. Kenzo Kase in Japan more than 25 years before. Kinesio-taping applications individually suited to patients' needs, support, curing processes and provide new quality of physiotherapy.

According to the manufacturers of Kinesio-taping, the tape causes micro-convolutions or folds in the skin which causes a lifting of the skin away from the tissue beneath. This facilitates a release in pressure on tender tissues underneath and provides space for lymphatic fluid movement, increases circulation of blood which helps to fasten wound healing. This can help relieve pain, prevent over contraction, facilitate lymphatic drainage and improve kinesthetic awareness[2].

Kinesio-taping can be applied in four basic therapeutic aims: Mechanical correction which gives stabilization, muscular and fascial tone normalization, improvement and correction of mobility range, pain and swelling reduction. Restoration of normal fluid perfusion helps in facilitation of lymph blood flow, swelling reduction and resulting reduction of incorrect sensibility and pain of skin and muscles. Provides support for muscular activity to relax muscles, fatigue reduction and restoration of mobility range and pain relief. Analgesic system activation helps in elimination of pain cause and activation of

pain inhibitors[3].

Kinesio taping is a commonly used intervention in the treatment for several musculoskeletal and neurological disorders in patients. Also in sports injuries, Kinesio-tape is useful. But very few studies are available for using kinesio-tape in abdominal surgery patients.

Therefore, need arise to assess the effects of kinesio-tape on surgical incisions in subjects with lower abdominal surgery.

AIM & OBJECTIVES:

AIM: To assess the effects of Kinesio tape on surgical incisions in subjects with lower abdominal surgery.

OBJECTIVES:

1. To study the effects of kinesio-tape on surgical incisions in post abdominal surgery.
2. To compare the effects of kinesio-tape between control and experimental group.
3. To determine the level of prescribing of kinesio-taping immediately after abdominal surgery.

Hypothesis:

Null hypothesis(H0): No significant changes in outcome measures between the control and experimental group.

Alternate hypothesis(H1): Significant changes in outcome measures between the control and experimental group.

MATERIALS AND MATHODS:

Materials: Kinesio-tape roll, Scissor, pen, paper, sanitizer

Source of data: From Surgical and maternity hospitals.

Method of data collection: Convenient and allocation of group by randomization of participants.

Inclusion criteria:

- Age between 25-50 years old both male and female, underwent lower abdominal surgery.

Exclusion criteria:

- Upper abdominal surgery
- Laparoscopy surgery
- Severe cardiac and lung conditions, known case of diabetes and post-operative complications (e.g. fever, wound infection) and neurological impairment

Study design: Randomized controlled clinical trial

Before application of Kinesio-taping, skin sensitivity test was done pre-operatively to check any allergic reaction due to Kinesio-taping.

Skin sensitivity test for Kinesio-taping: A piece of kinesio-tape was applied over flexor aspect of forearm for 6-8 hours with stretch of inhibitory technique4. Skin reaction by means of itching, redness was noted in randomly selected participants.

The participants were randomly divided into two groups.

Group 1- Control group (11 participants) only conventional treatment given

Group 2- Experimental group (11 participants) conventional treatment followed by Kinesio-tape

Sample size: 22

Assessment criteria: Basic demographic information was collected and baseline evaluations were performed at the time of post-operative. Both the groups were received standard methods of treatment by means of medical care and physiotherapy.

The participants consents were obtained to participate in the study. All the volunteered participants were randomly divided into two groups. The control group and the experimental group.

Following assessment tool was used as outcome measure in both the groups and was administered after 4 hours of surgery as the participant gets withdrawn from anaesthetic effect.

- Documenting Surgical Incision Site Care (DSISC)[5]
- VAS (Visual Analog Scale) to assess pain intensity[6]

The outcome measure were assessed post treatment on the basis of first 24hrs, 48hrs, 72hrs…till 5th day postoperatively.

In group 1 (Control group): Participants received conventional treatment by means of medical care and physiotherapy. Physiotherapy care included education about post-operative complications, bed exercises (hip, knee and ankle movements), early transfer to chair (on day of surgery or POD1) and ambulation, diaphragmatic breathing and manual techniques as clinically indicated. Informed consent form was delivered to each participant prior to procedure. Documenting Surgical Incision Site Care (DSISC) and Visual Analogue Scale (VAS) were assessed immediately after conventional treatment till 5th day. Following components of DSISC were assessed and documented: the anatomic location of the incision, the length of the incision in cm and depth measurement in mm, the appearance of the incision and surrounding skin, assess pain by Visual Analogue Scale (VAS).

In group 2 (Experimental group): Participants received conventional treatment and Kinesio-tape applications. A clear explanation about the kinesio-tape procedure was given to each participant, that was applied post-operatively after the conventional treatment and was changed every 24 hours until 5th day post-operative in addition to the standard post-operative care. Removal of tape was done gently rubbing on skin and removing the tape simultaneously.

Following kinesio-taping techniques were used over abdominal area.

Muscle inhibition application: Kinesio-taping was applied from distal to proximal attachment on external oblique (EO) muscle on the left side with 15% of stretch[7]. This technique is more preferable in very acute stage as mechanically it inhibits and relaxes the muscle and thus inhibits pain.

Muscle facilitation application: Kinesio-taping was applied from proximal to distal attachment on internal oblique (IO) muscle on right side with 25% of stretch[7]. For transversus abdominis (TA) muscle Kinesio-tape was applied proximal to distal attachment of bilaterally with 25% of stretch. During the application patient was instructed to inhale in his/her comfort zone to stimulate the stretch reflex. Kinesio-tape was applied for 24 hours. Informed consent form was delivered to each participant prior to procedure.

Documenting Surgical Incision Site Care (DSISC) and Visual Analogue Scale (VAS) were assessed after conventional and Kinesio-tape application till 5th day.

Documenting Surgical Incision Site Care (DSISC): Document the anatomic location of the incision, chart the length of the incision in cm and include depth measurement, note the appearance of the incision and surrounding skin, assess pain by Visual Analogue Scale (VAS).

Statistical methods for analysis:

All the collected data were inserted in the SPSS to apply both descriptive and inferential statistical analysis.

Mann Whitney test was used to compare the outcomes between groups and one way ANOVA was used to compare the outcomes within groups. The level of significance was at 0.05.

RESULT:

Total 22 patients (20 females, 2 males) were participated in the current study with mean age (40.83±5.99). They underwent different lower abdominal surgeries, the experimental group (8 LSCS, 2 abdominal hysterectomy, 1 appendicectomy) and the control group (9 LSCS, 1 abdominal hysterectomy, 1 appendicectomy).

Regarding the length of the incision both experimental (1.55±0.52) and control group (1.32±0.22) did not show significant difference between group in length of the incision, between Day1 and Day5 ($p>0.05$).

Further, the width of the incision was compared in both experimental (1.97±0.83) and control group (1.73±0.61) and there was no significant difference between group from Days1 and Day5 ($p>0.05$).

In addition, the appearance of incision both experimental and control group and there was no significant difference between group from Day1 and Day5.

Regarding VAS both experimental (4.55+_ 0.79) and control group (2.25+_0.41) showed between group a significant difference between Day1 and Day5 ($U= 1.5$) ($p<0.05$).

Table 1. Gender distribution

Gender			
Group		Frequency	Percent
Experimental Group	F	10	90.91
	M	1	9.09
	Total	11	100.0
Control Group	F	10	90.91
	M	1	9.09
	Total	11	100.0

Table 2. Difference in DSISC and VAS score in both groups

	Experimental		Control		Man Whitney	P Value
DSISC	**Mean**	**SD**	**Mean**	**SD**		
Difference length of incision day1 and day5	1.55	0.52	1.32	0.22	2.5	0.098
Difference depth of incision day1 and day5	1.97	0.83	1.73	0.61	1.5	0.099
Difference VAS Day1 and Day5	4.55	0.79	2.25	0.41	0	<0.05

DISCUSSION:

The current study showed significant ($p<0.05$) pain reduction in experimental group in VAS and the possible explanations to this reduction are, Kinesio tape's elasticity creates skin folds which can lift the skin to increase space between skin and muscle to improve circulation of blood and lymph. Since this space contains a variety of nerve receptors that send specific information to the brain. Kinesio tape modulates the information that is sent by the receptors to the brain and makes less reactive responses in the body. This process allows the body to have an adaptive normal function by moving out of the barrier which naturally slow down the recovery process[8]. In this study there was significant pain reduction noted at or near the incisional site.

In addition taping activates neurological suppression in order to reduce pain and increase joint range of motion. Also, Kinesio tape lift the fascia and soft tissue above the areas of pain, align fascial tissues and provide positional stimulus through the skin[9].

Yoshida and Kahanov stated that Kinesio tape is to decrease pain by stimulating the neuromuscular system; assists in restoration of proper muscle function and realignment of joints as a result of injury or disease. Finally, Kinesio tape enhances comprehensive body function by improving the flow of blood and lymphatic fluid throughout the body[10].

Marcin Krajczy et al concluded that kinesio taping is an effective method of physiotherapy support in patients after abdominal surgery, there was regular and significant reduction was obtained in abdominal circumference what caused pain relief and use of fewer analgesic agents[3]. Another possible theory to be taken into account for the analgesic effects of KT is the gate control theory of pain modulation. The tape has been suggested to stimulate neuromuscular pathways via afferent feedback. Increased afferent stimulus to large diameter nerve fibers might reduce pain perception level due to an input decrease from the small diameter nerve fibers conducting nociception[11, 12]. One more study by Marcin Krajczy et al. on Kinesio taping in patients after laparoscopic cholecystectomy found that Kinesio taping employed in physiotherapy of patients after laparoscopic cholecystectomy leads to a decrease in pain perception and significantly reduces pain relief medicines' intake, improvement in effort tolerance achieved and provides effective support for physiotherapy and through postoperative wound stabilization, reduces functional activity disorders resulting from cholecystectomy allowing for shortening of hospitalization time[14] .

Ana Luiza Machado et al. studied Kinesio taping effects on healing area and revealed a significant reduction in the scar area in all tissues subjected to KT strains, a significant increase in the vascular density of scar tissue subjected to 80% strain, in addition to the predominance of type III collagen fibers and reduction of type I collagen fibers. Thus KT bandaging was able to cause changes in scar tissue and may influence the healing process of the skin, but further molecular studies are still required to find out how the mechanisms occur, however potential benefits of KT in modulating the architecture and function of cutaneous repair tissue was noted[19]. In the present study there was no significant changes found on incision healing by means of length, width and appearance of incision. However, subjects were less in number. In future, with large number of subjects the effects of KT on surgical incisions recommended.

Ethical clearance- Ethical clearance is received from Institutional Ethical Committee for Human Research (PU-IECHR).

Declaration- The prior consent of the participants was taken before application of Kinesio-taping and the work was carried out after getting clearance from the institutional ethics committee.

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