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Immediate effect of kinesiotaping to rectus abdominis muscle on peak expiratory flow rate (PEFR) in post abdominal surgery patients

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ABSTRACT

The purpose of this study was to determine the changes in the PEFR values after application of Kinesiotape to rectus abdominis in post abdominal surgery patients. This study was conducted on 30 subjects who underwent abdominal surgery. The study was conducted within 3 days post-surgery. The PEFR levels were recorded before applying kinesiotape using wright peak flow meter.3 readings were taken in sitting position and mean was recorded. Kinesiotape was then applied to the rectus abdominis muscle area over abdomen in the stretch position where the arms were flexed overhead. After application 3 PEFR readings were recorded and mean was calculated. On comparing the pre and post values, there was increase in the PEFR values post application of kinesiotape. Thus this study says that there is immediate effect of Kinesiotaping to rectus abdominis on PEFR in post abdominal surgery subjects.

Keywords: Immediate, Kinesiotape, Abdominal surgery, Peak expiratory flow rate, PEFR, Rectus abdominis

INTRODUCTION

Surgeries give rise to body function disorders and pain is one of the significant problems [1]. The respiratory muscles are affected due to the side of the operation and the type of surgery [1]. In abdominal surgeries common muscles which are cut are the internal oblique, External oblique, Rectus Abdominis since these muscles are expiratory muscles, and the expiratory function is impaired. The internal and external oblique abdominal muscles are forced expiration muscles that help the exhalation of air by increasing the abdominal pressure during forced expiration. The diaphragm, which is a primary respiratory muscle, acts as a piston. It lowers pleural pressure and inflates the lungs by moving in the caudal direction with the ribs [4].

Physical immobility causes reduction in lung volume and it affects the respiratory and cardiovascular system than the musculoskeletal system, also the recovery is slower. It has been suggested that respiratory muscle dysfunction may be responsible for a number of pulmonary

complications including atelectasis and pneumonia. Perioperative stay of more than 7 days associates with an increase chances of Pain in the abdomen from operative trauma, or else the inflammation gives rise to rigidity of the anterior abdominal wall and there is associated reflex inhibition of the diaphragm, The lower lobes of the lungs then do not freely expand and contract, so that congestion of the blood with oedema sets in [2].

The aim of giving physiotherapy in surgery patients is to prevent complications that occur after surgery and treatment of postoperative functional disorders that have set in [1]. This study shows the effect of kinesiotape on the PEFR which is simplest form of checking the lung function to carry out early physiotherapy.

Kinesiotaping: one of the recently used technique in musculoskeletal injury, management of scar tissue, lymph oedema as well as in sports injuries. Kinesiotaping simultaneously facilitates the reduction in oedema, increases the lymph and blood circulation, through the mechanism of proprioception normalizes the muscle function and support of ligaments and tendons. It results in faster reduction of pain and improvement in the joint and muscle function [5]. The method is used to support the body's healing process. Its effects of mechanism vary depending on the technique used.

Peak expiratory flow rate (PEFR). This is the highest flow that can be achieved during a forced expiration from a full inspiration [9]. Peak flow measures the ease with which the lungs are ventilated and reflects resistance in the large airways, expiratory muscle strength and effort [9, 7].

METHODOLOGY

The study conducted was experimental study with purposive sampling. The study was carried out at rural hospital on 30 subjects who underwent abdominal surgery. Patients with unstable medical condition, allergic to kinesiotape, patients having open wounds over taping region were excluded from the study.

Procedure

Informed written consent was taken from the subjects. Study procedure was explained to them. Screening of the subjects was done. 30 subjects were selected as per the inclusion criteria. Demographic data was recorded. Demonstration was given to the subjects. Pre data was recorded with patient in sitting position with wright peak flow meter placed at 90 degree [3] readings were taken by asking the subject to perform deep inspiration and expire forcefully. The subject was then asked to lie supine on the plinth and asked to elevate his/her arms above head in order to stretch the Rectus Abdominis muscle and then Kinesiotape was applied from the ASIS towards the xiphisternum with no stretch [5] to facilitate the Rectus abdominis muscle. 3 PEFR readings were taken after application of kinesiotape and mean was recorded.

STATISTICAL ANALYSIS AND GRAPH

Values of the PEFR before and after application of Kinesiotape to Rectus Abdominis were statistically analysed using paired t-test.

MEAN PEFR	
PRE(L/min)	POST(L/min)
178.26	239.22

	PRE RESULTS	POST RESULTS	DIFFERENCE
MEAN	178.26	239.22	60.957
STANDARD DEVIATION(SD)	64.301	70.468	40.289
STANDARD ERROR(SE)	11.721	12.866	7.356
p-VALUE	<0.0001		

The p value = 0.0001 which is considered as extremely significant.

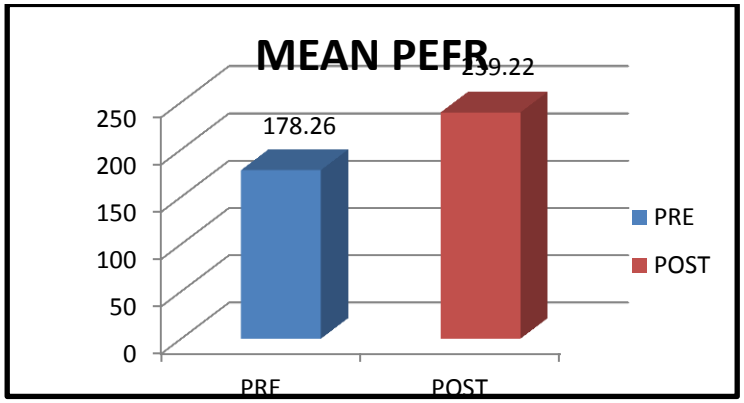

Fig. 1

DISCUSSION

The current study was undertaken to assess if there is significant difference in the PEFR values post taping over abdominal muscles. The study was performed on 30 subjects who underwent abdominal surgery within age group of 18-30 years. All 30 subjects were in experimental group who had completed not more than 72 hours post-surgery period. Kinesiotape was applied to each patient over the rectus abdominis muscle and pre and post taping PEFR values were noted. According to Dr. Kase et al, (1979) the possible beneficial effects when the tape is applied include the following: Improves the contraction ability of muscle, Adjust malalignment of the muscle, myofacia and joint. When the muscle is relaxed after application in stretched position, the tape will form convulsions which increase circulation and help to allow the muscle to return to its normal length. When kinesiotape is applied over the Rectus abdominis the possible mechanism can be like the abdominal binder.

As the muscle is activated, its efficient contraction will cause the lungs to expire completely allowing the lungs to fully inflate in the following inspiration. According to the studies by Heather M. Murray, PhD (2000) the muscle activation with KT via EMG was noted in the affected muscles post application of kinesiotape, while not much difference was seen in normal individuals [8]. So after application of kinesiotape the pain is also reduced which helps to reduce the shallow breathing pattern.

As studies have shown the effect of Kinesiotaping to external and internal oblique muscles that increased the lung volumes significantly (Marcin Krajczy et. al) the current study shows increase in the peak expiratory flow rate which is a measure to check the forceful expiration after applying Kinesiotape to Rectus abdominis muscle [1]. Clinically the patients could feel the ease while expiration after applying kinesiotape. This will help the patient to take part in early physiotherapy. A combination inspiratory and expiratory exercise can be given. As there are risks of pulmonary infection, these chances can be reduced if the respiratory function is restored to normal. As abdominal binder is also recommended in early post op, more studies can be undertaken to compare the effects of the same on different outcome measures.

CONCLUSION

The study concludes that there is significant increase in PEFR immediately after applying kinesiotape.

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