

Effect of Physiotherapeutic Intervention on Pain and Physical Exertion in Patients with Postoperative Abdominal Surgeries

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ABSTRACT

Background: With an estimated 234 million surgeries carried out each year, abdominal surgery has become a crucial component of worldwide health care. Surgery plays a part in the treatment of a wide range of illnesses and the reduction of suffering in people. While primarily focusing on physical rehabilitation, physiotherapy may have an impact on a number of the other domains. Physiotherapy aims to facilitate recovery from surgery by preventing or resolving post-operative complications and providing physical rehabilitation to assist a return to pre-morbid physical function.

Methods: 40 patients with abdominal surgery above 18 years, both males and females were included in the study and were divided into two groups i.e. group A and group B. Group A were on physiotherapeutic intervention along with breathing exercises and group B were on only breathing exercises. All the patients evaluated for pain and exertion before and after the treatment. The duration of intervention was of 2 months with therapy session per week for 30-40 minutes for weeks.

Results: The finding of present study shows statistical significant improvement in score of VAS in both groups and in score of BORG only in intervention group whereas control group showed no statistical significant improvement in score of BORG in control group.

Conclusion: It is concluded that breathing exercise along with physiotherapeutic intervention is more effective than only breathing exercise, indicating the improvement in the intensity of pain and level of exertion at the end of treatment session.

Keywords: Deep breathing exercises, BORG, early mobilization, VAS, postoperative pain, level of exertion.

Abdominal surgeries are performed for the diagnosis and treatment of many diseases besides that could be to remove cancerous tissue, to resolve visceral tissue perforations or to remove inflammatory bowel segments, benign growths, or vascular aneurysms. The World Bank in 2002 reported that an estimated 164 million disability-adjusted life years, representing 11% of the entire disease burden were attributable to surgically treatable conditions(1). Postoperative pulmonary complications (PPCs) following abdominal surgery are very common and are responsible for increased morbidity and mortality as well as the length of hospital stay and health related cost of care.

Physiotherapy aims to facilitate recovery from surgery by preventing or remediating post-operative complications and providing physical rehabilitation to assist a return to pre-morbid physical function, and

whilst primarily focusing on physical rehabilitation, physiotherapy may impact on a number of the other domains. Physiotherapists currently undertake post-operative screening utilizing a variety of assessment tools, and treat patient with a combination of early mobilization and respiratory interventions post-operatively.(2)

Surgical care has a role in treating a broad spectrum of diseases in the alleviation of human suffering. A significant proportion of the population has undergone one or the other forms of surgical procedures at one or more points in the life time of an individual.(3) Surgery has become an integral part of global health care, with an estimated 234 million operations performed yearly. In Asia, It is estimated that 50% of patients with IBD, in particular crohn's disease require surgical intervention within 10 years from diagnosis and upto 80% will require surgery in their lifetime. In an urbanized community of Delhi, Cross-sectional study, conducted from October 2008 to April 2009 in Vivek Vihar—an urban affluent colony in Delhi. A total of 3,043 individuals residing in 622 households were interviewed as part of the study. Total number of households with some member having ever undergone surgery was 306 (49.2%). Surgery can be preventative, as in reducing HIV transmission through circumcision, or curative as in many cancers. It is often a component of acute emergency care, such as bowel perforations and trauma, as well as the treatment of chronic diseases such as inflammatory bowel disorders. Additionally, surgical care is important in the diagnosis and supportive care of numerous conditions. (1)

Common causes of an acute abdomen include acute appendicitis, cholecystitis, pancreatitis, and diverticulitis. Acute peritonitis is a cause of acute abdomen and can result from rupture of a hollow viscus or as a complication of inflammatory bowel disease or malignancy. The major causes of abdominal emergencies vary from region to region, and even within the same region socio-economic, cultural or geographical factors may alter the pattern. (4)

Major Systemic postoperative complications were defined as complications that occurred within 30 days after surgery that involved an increased risk of death. They included: (1)respiratory complications (pulmonary infections, conditions requiring ventilator use for >48 h, respiratory failure or unplanned intubation, and acute respiratory distress syndrome); (2) cardiovascular complications (various types of arrhythmias, unstable blood pressure requiring the use of drug support, myocardial infarction, or heart failure); (3) neurological complications (stroke, cerebral hemorrhage or postoperative delirium); (4) surgical site infections, including sepsis or septic shock and (5) hematological complications (deep vein thrombosis or excessive bleeding requiring infusion of blood products).

Following abdominal surgery, patients have a variety of issues, including pain at the surgical site, a protracted healing period, and an extended hospital stay. After abdominal surgery, postoperative problems are frequent, with one-third to half of patients experiencing some kind of issue. With physiotherapy interventions, issues such postoperative pulmonary complications, cardiovascular complications, and the after effects of extended immobility may be avoided.

With the help of this study, patients who have undergone abdominal surgery will be efficiently treated to lessen their pain, exertion level, and rebuild their strength, enabling them to function independently.

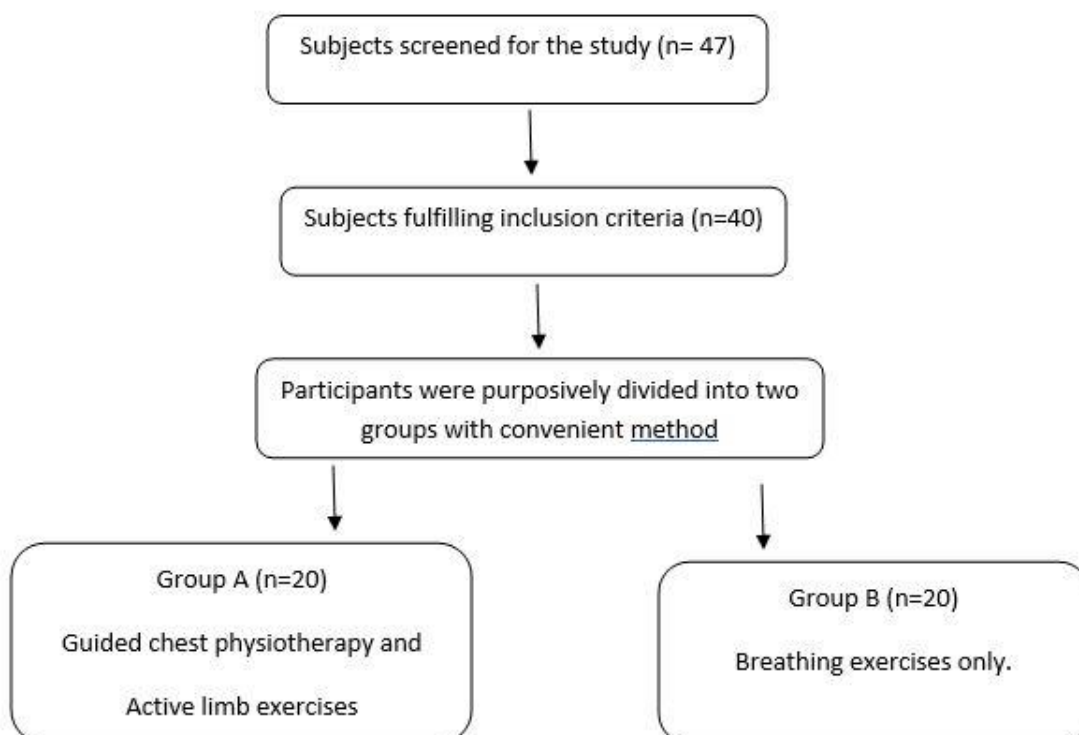
The paper demonstrates how physical therapy helped the patient recover after abdominal surgery and the progress of individuals receiving physiotherapy treatment.

MATERIALS AND METHODS

The inclusion criteria includes age above 18 years, patients who underwent general anesthesia, patients without heart, pulmonary and/or neuromuscular diseases, patients who had not been on mechanical ventilation and/or in intensive care for more than 48 hours. Patients who are unwilling, undergoing any other surgery and laparoscopy surgery, patients with an indication for liver transplantation, or who presented aneurysm of any arterial segment were excluded since these patients stay in the intensive care unit for a longer time during the postoperative period. The subjects were screened at the Inpatient department of surgery. Out of 47 screened subjects, 40 subjects were included as per the selection criteria. The demographic profile and detailed medical history was taken through individual interviewing. Further, the selected subjects were divided into Group A and Group B using convenient sampling. After that, the patients were assessed before the intervention for the level of exertion and pain using Modified Borg Rating of perceived exertion and visual analogue scale respectively.

Group A perform Breathing exercise program consists of Deep breathing exercises (3-5 repetitions for half hour), Coughing – 1-3 times/day during initial days of postoperative surgery (atleast for two weeks), Sitting at the edge of bed – twice a day (first for 20 minutes then gradually increasing the time each day) for two months.

Exercises incorporated after two weeks of breathing exercise program were: Bilateral Ankle toe pumps – 10 each leg -twice a day, Bilateral Knee bending – 10 reps. each leg -twice a day, Abdominal isometrics, Pelvic tilting, Bilateral Knee rolling side to side – 5 reps.-3 times a day with 5 sec. hold, Walking – at least for 10m (around bed space, to the toilet, or just walking).After 4th week, these exercises were progressed with increased holding duration and repetitions. In group B, the patients were administered only breathing exercise program mentioned above in group A. Breathing exercises included deep breathing exercise and Diaphragmatic breathing exercise for 30 minutes with adequate rest intervals. The subjects were reassessed after the two months of interventional programs.



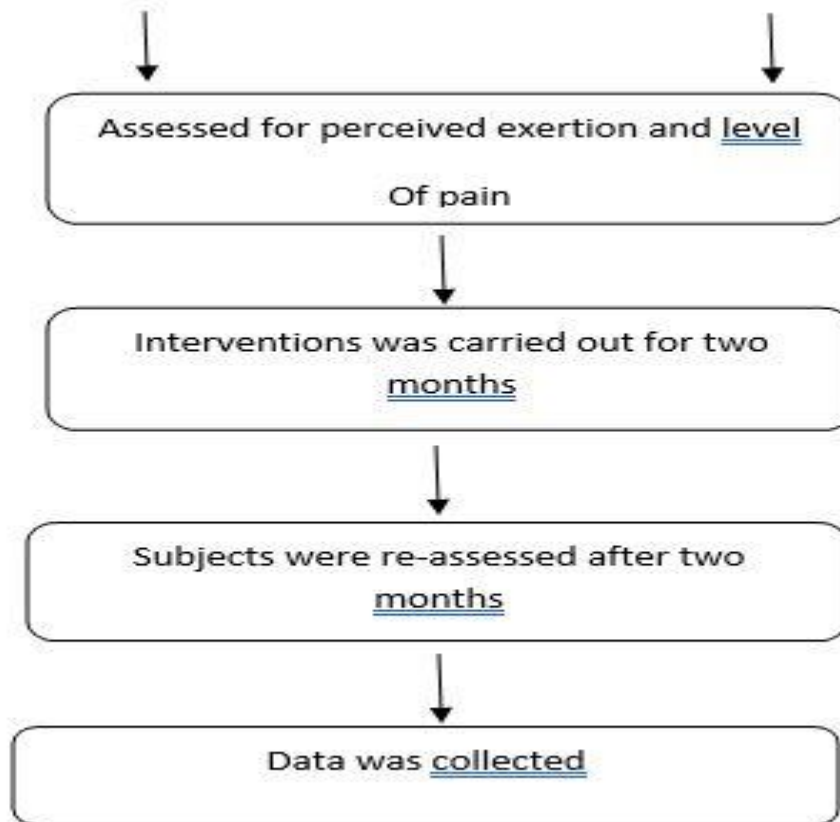


FIGURE 4.1: FLOW CHART DEPICTING THE PROCEDURE

RESULT

In this study, total 40 patients of abdominal surgery of different causes were included. The demographic data was calculated and matched which showed non-significant results.

All the patients were assessed for exertion rate and pain using BORG and VAS scales respectively. The comparison of mean score of BORG scale revealed statistical significant results in only group A using paired t test with p value 0.0003 whereas the patients receiving breathing exercises in group B showed statistical non-significant results and depicted in Table 1.

Table 1: Comparison of mean scores of BORG & VAS scores within two groups A and B

| Parameter | Group A | | Group B | | t value | P value |
|-----------|---------------------------|----------------------------|---------------------------|----------------------------|---------|---------|
| | Pre intervention Mean ±SD | Post intervention Mean ±SD | Pre intervention Mean ±SD | Post intervention Mean ±SD | | |
| VAS | 5.9±1.64 | 2.75±0.94 | 7.55±1.24 | 3.6±0.916 | 14.26 | 0.0001 |
| BORG | 8.65±1.314 | 6.5±2.269 | 8.9±0.99 | 8.65±1.27 | 4.45 | 0.0003 |

The comparison of mean score of VAS scale revealed statistical result in both the groups with the p value for group A was 0.0001 and for group B was 0.0001 respectively. Further, analysis of improvement of mean scores of VAS indicated statistical significant improvement in group A only with p value 0.0001 and it was described in Table 2.

Table 2: Comparison of improvement of mean scores of VAS between groups A and B

| Parameter | Group A Mean ± SD | Group B Mean ± SD | t value | P value |
|-----------|----------------------|----------------------|---------|---------|
| VAS | -3.15±0.99 | -3.95±1.05 | 1.42 | 0.171 |

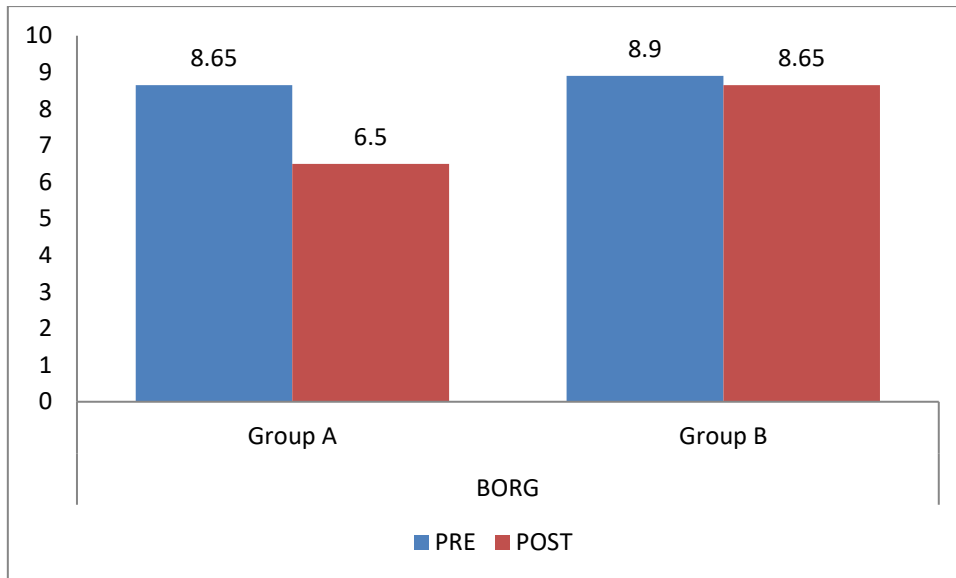


Figure 5.3 Graphical display of comparison of mean score of BORG

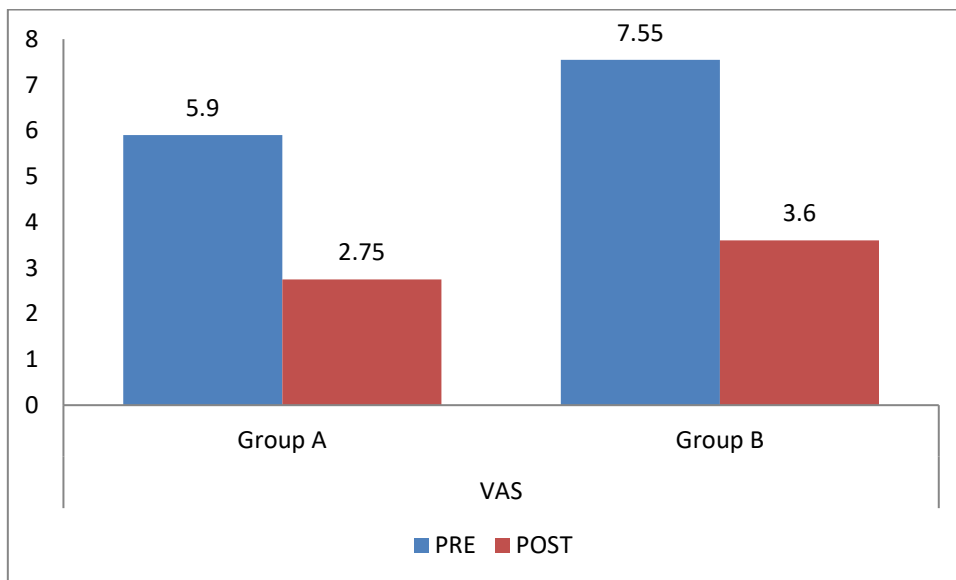


Figure 5.4 - Graphical display of comparison mean score of VAS

Discussion

In the present study total 47 patients were screened and only 40 patients fulfilled inclusion-exclusion criteria. This study was carried out without any adverse effects or subject withdrawal. Two scales were used for this study one was BORG and the other was VAS. The parameters used for the assessment using these scales were exertion and pain respectively. The study showed highly significant improvement in the group receiving physiotherapy program in context of fatigue using BORG scale whereas both the groups showed significant improvement in reducing pain using VAS scale. Therefore

the effect of conventional physiotherapy and breathing exercise after immediate postoperative periods was proven.

The BORG rating of Perceived Exertion is a way of measuring physical activity intensity level. It is based on the physical sensation of the person experiences during physical activity, including increased heart rate, increased respiration or breathing rate, increased sweating, and muscle fatigue. There have been studies that report exertion in patients after abdominal surgeries. Studies report that 44% patients reported that their IBD limited their exercise for reasons including fatigue, joint pain, weakness and others.

In the present study, one of the parameter assessed was of exertion using BORG which have revealed significant result in group A patient receiving conventional physiotherapy and breathing exercise program.

In the present study, the result showed significant improvement in group A only which is an accordance with the study conducted by Fatima Zaid Aldhuhoori et al. (2021),(5) on Physiotherapy Practice for Management of Patients Undergoing Upper Abdominal Surgery. In this study they documented improvement in the BORG scale in their interventional group. Breathing exercises also prevent postoperative pulmonary complications.

On the contrast, Shane Patman (2017)(6) documented in their study that there is no improvement in patients receiving only breathing exercises which is also documented in current study.

There have been studies which report postoperative pain after abdominal surgeries. During surgeries like an appendectomy, gynecological surgery or hernia repair, it is possible for abdominal or pelvic nerves get to cut, stretched or damaged. Sometimes, having surgery can damage nerves. This can lead to pain after surgery (postoperative pain). Nearly 20 per cent of patients experience severe pain in the first 24 h after surgery, a figure that has remained largely unchanged in the past 30 years. Reported worldwide prevalence varies from 14% to 70% depending on the intensity considered, type of surgery and anaesthesia, time of data collection, institutional protocol for pain management, etc. In the current study, both the groups namely intervention group and control group reported significant result in both the groups.

Fatima Zaid Aldhuhoori et al. (2021),(5) documented in their study that there is significant improvement in postoperative pain after intervention. Aleisha Robinson (2019)(7), also documented in their study that there is positive impact of physiotherapy treatment on postoperative pain.

Further, investigating the improvement in the mean score of VAS showed significant improvement in group A only Whereas group B showed no significant improvement.

CONCLUSION

According to present study, both groups experienced a significant decrease in pain measuring on VAS scale but only group A shows reduction in exertion measuring on BORG scale when compared to group B. As a result, we draw the conclusion that a treatment programme that combines breathing exercises and exercise therapy is more effective than one that uses just breathing exercises.

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