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Effect of Modified Breathing Exercise to Improve Abdominal Strength in Caesarean Section Women

Dasarapu Indrani*, Jagatheesan Alagesan, Prathap Suganthirababu, Dubba NagaRaju.Vishnu Priya Suresh.

Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences, Chennai.

*Email: indranidasarapu@gmail.com

Abstract

Background: The present National Policy for Health Promotion places a strong emphasis on raising public awareness of the importance of various forms of health and exercise. The women musculoskeletal system is impacted by several physiological events that take place during pregnancy. The inter-recti distance (IRD) typically increases and the abdominal muscles are stretched greatly which weakens the abdominal muscles. One of the lives saving procedures used on women most frequently today is a caesarean section (CS) for delivery.
Objective: To evaluate the effect of modified Breathing Exercise and Abdominal Draw-in Maneuver to improve Abdominal strength in Post CS Women.
Methods: A single blinded pilot randomized controlled trial was conducted on CS women. Post CS women were divided into 2 groups, that is group ADM (Abdominal Draw-in Maneuver) and group CBE (Corset Breathing Exercise) based on inclusion and exclusion criteria. The outcomes used in the study were pressure biofeedback unit and Abdominal curl test. Group ADM are treated with Abdominal Draw-in Maneuver and group CBE treated with Corset Breathing Exercise.
Result: The result of the study showed that there was a significant difference between the groups. Statistical analysis of posttest vales of pressure biofeedback unit and Abdominal curl test revealed that post CS women who received Corset Breathing Exercise in group CBE showed marked improved compared to group ADM, the p value for both the outcomes are less than 0.001($P< 0.001$).
Conclusion: This study concluded that both groups ADM and CBE resulted in positive outcomes but group CBE with Corset Breathing Exercise showed more positive outcome in improving abdominal muscle strength.

Keywords

Lower Segment Caesarean Section, Postpartum women, abdominal Draw-in Maneuver, Corset Breathing Exercise.

Introduction

The present National Policy for Health Promotion places a strong emphasis on raising public awareness of the importance of various forms of health and exercise. It is challenging to think that a new mother will not engage in quite strenuous activity after she has healed, she should

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engage in a lot of exercise, however women differ greatly in their opinions about exercising (Vijaya Rani et al., 2016). The women musculoskeletal system is impacted by several physiological events that take place during pregnancy. The inter-recti distance (IRD) typically increases and the abdominal muscles are stretched greatly which weakens the abdominal muscles (Deering et al., 2018). One of the procedures used on women most frequently today is a caesarean section (CS).

Data from 150 nations show that 18.6% (6%–27.2%) of births today are caused by CS (Fan et al., 2020). In India, the birth rate in 2021 is 17.1% per 1000 people and the national rate of caesarean sections is 21.5 percent greater than the optimum range of 10 to 15%, according to the 5thNFHS. The trend of c-section deliveries has increased recently, sometimes because it is essential (large baby, contracted pelvis, prolonged labour), and other times because the mother does not desire a vaginal delivery owing to fear, lack of cooperation, etc. (Macwan P et al., 2022) Function of the abdominal muscles after giving birth may also be influenced by other variables, such as the delivery method and level of physical activity. The anterior abdominal wall is severely disrupted after a caesarean delivery than vaginal delivery, which is linked to more reports of postpartum pain and a delayed, more difficult recovery (Lobel and DeLuca, 2007). Hence our study was undertaken with an intention to provide modified breathing exercise to improve abdominal strength in caesarean section women. This study was to determine whether Abdominal Draw-in Maneuveroffer any advantage overCorset Breathing Exercise.

Methodology

A single blinded pilot randomized controlled trial was conducted on CS womenon 30 subjects using convenient sampling technique based on inclusion and exclusion criteria. Postpartum women between age of 20 to 35years, women with 8weeks of postpartum were included in the study. Postpartum women with severe co morbidities, women with postpartum complications are excluded from the study. After receiving informed consent, the CS women were fully explained about the study. The outcomes used in the study were pressure biofeedback unit and Abdominal curl test. Post CS women were divided into 2 groups, that is group ADM (Abdominal Draw-in Maneuver) and group CBE (Corset Breathing Exercise) Group ADM were treated with Abdominal Draw-in Maneuver and group CBE treated with Corset Breathing Exercise.

In Group ADM subjects were treated with Abdominal Draw-in Maneuver, Subjects were instructed to lie down in supine position in yoga mat. There were asked to go to hook-lying position, in this position subjects were instructed to pull their Navel deeply to the lumbar region for 10 times to 10sets for 5days per week for a period of 12weeks.In Group CBE subjects were treated with Corset Breathing Exercise.Subjects were instructed to lie down in supine position in yoga mat. They were asked to go to hook-lying position, in this position subjects were instructed to pull and contract the corset muscles deeply to the lumbar region followed with exhalation of breath through mouth. Then relax the corset followed with inhalation through nose for 10 times to 10sets for 5days per week for a period of 12weeks. Subjects were evaluated with were pressure biofeedback unit and Abdominal curl test before starting the procedure and after 12weeks (Ramalingam et al., 2023).

Results and Discussion

The data was analysed statistically by using inferential and descriptive statistics, mean and standard deviation was done by using paired and independent t tests. For between groups analysis of the pre-test and post- test values unpaired 'T test' was utilised. To find the analysis of within group Paired T- test was utilised. Subjects were completely assessed and examined by using Pressure biofeedback unit and Abdominal curl test outcome measures before starting the procedure.

Table 1. Pressure biofeedback unit Pre-Test and Post-Test values of Group ADM

	Pre -Test	Post -Test	T value	P value
Mean	4.31	6.27		
Standard Deviation	0.52	0.31	-8.753	P<0.0001

Table 2. Pressure biofeedback unit Pre-Test and Post-Test values of Group CBE

	Pre -Test	Post -Test	T Value	P Value
Mean	4.27	8.18		
Standard Deviation	0.48	0.56	-3.799	P=0.98

In between the post-test mean and standard deviation of both group ADM and group CBE with Pressure biofeedback unit was 6.27(0.31) and 8.18 (0.56) and there was a significant difference in-between the group ADM & CBE among the values of (P<0.0001) While the pre and post-test mean and standard deviation of group ADM and group CBE with Abdominal curl test was 62.8(0.28) and 81.2 (0.93) respectively. Statistical analysis of posttest vales of pressure biofeedback unit and Abdominal curl test revealed that post CS women who received Corset Breathing Exercise in group CBE showed marked improved compared to group ADM, the p value for both the outcomes are less than 0.001(P< 0.001). This study is to find out whether Abdominal Draw-in Maneuver or Corset Breathing Exercise is useful for Post CS women. Coreset breathing exercise needs complete attention of the subject where the complete coreset is pulled inwards along with breathing pattern which provides strength to abdominal and thoracic muscles by creating pressure.

Table 3. Abdominal curl test Pre -Test and Post-Test values of Group ADM

	Pre -Test	Post- Test	T Value	P Value
Mean	43.2	62.8		
Standard Deviation	0.35	0.28	8.876	P<0.0001

Table 4. Abdominal curl test Pre and Post-Test values of Group CBE

	Pre -Test	Post -Test	T Value	P Value
Mean	43.9	81.2		
Standard Deviation	0.87	0.93	2.137	P=0.043

Table 5. Difference between Post-Test values of Group ADM&CBE

Group	Mean	Standard deviation	T value	P value
Pressure biofeedback unit				
Group A	6.27	0.31	2.086	P<0.0001
Group B	8.18	0.56		
Abdominal curl test				
Group A	62.8	0.28	6.368	P<0.0001
Group B	81.2	0.93		

During respiration, the lungs cannot contract by themselves. Instead, they passively contract and relax as a result of the breathing muscles in the thoracic cage contracting and relaxing, which causes gas exchange between the lungs and the air. While the diaphragm passively recoils during relaxed expiration, the diaphragm is pulled upwards during forced expiration due to an increase in intra-abdominal pressure brought on by the contraction of the abdominal muscles. Additionally, the diaphragm, a part of core stability, contributes to breathing by regulating intra-abdominal pressure and easing abdominal strain through joint action with the abdominal muscles (Kim and Lee, 2013). Physiotherapist created the pressure biofeedback unit (PBU) as a tool to evaluate and assist the retraining of stabilising muscles using specific workouts, and monitors the movement of relative size of the given muscle to an air-filled reservoir. Utilizing such pressure sensors for visual assessment using biofeedback (Cairns et al.. 2000). Abdominal curl test (Moran et al.,2018) has its own validity and reliability which provides equal amount of work when performed during equal repetition and it can be used for

assessment and treatment as well. Hence the present study was undertaken with an intention to provide modified breathing exercise to improve Abdominal strength in post LSCS women.

Conclusion

This study concluded that both groups ADM and CBE resulted in positive outcomes but group CBE with Corset Breathing Exercise showed more positive outcome in improving abdominal muscle strength than ADM.

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