

Effect of Graded Theraband Exercise on Myofascial Dysfunctions in Breast Cancer Survivors

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Abstract

Background: Cancer is the leading cause of morbidity and mortality. Breast cancer is the most common form of cancer among women. Many breast cancer surgeries lead to dissection of muscles and soft tissue structures. After the breast cancer treatment many complications are seen in breast cancer survivors. In that myofascial dysfunctions are common. These dysfunctions are one of the common sources of pain and discomfort. Not only pain but this dysfunction also leads to decreased range of motion, decreased strength, and altered posture. Because of dysfunctions, an upper body function decreases and affects the activity of daily living. Graded theraband exercises are effective in improving muscle strength and shoulder range of motion in breast cancer survivors. And also helps to enhance functional capacity. Early rehabilitation can be implanted to reduce pain, improve strength and flexibility which will be helpful in minimize restrictions in daily living activities and improve quality of life. This effectiveness study will help to enlighten the status of myofascial dysfunctions in breast cancer survivors. The objectives of the study were as follows: To find out the effect of graded theraband exercise on myofascial dysfunctions in breast cancer survivors.

Methods: A total 40 females who underwent breast cancer surgeries along with chemotherapy or radiotherapy or hormone therapy, were included based on inclusion criteria. All the females received theraband exercises along with medications for five days per week and pre and post assessment was done with manual muscle testing (MMT), shoulder range of motion (ROM), and Shoulder Pain and Disability Index (SPADI) questionnaire.

Result: The result concluded that strengthening with theraband showed better effect in the breast cancer survivors. Strengthening exercise program with resistance band showed significant improvement in the shoulder strength, ROM and activities of daily life.

Keywords: SPADI, MMT, Thera-band, myofascial dysfunctions, Breast cancer survivors (BCS)

Introduction

Breast cancer refers to cancers originating from breast tissue, most commonly from the inner lining of milk ducts or lobules that supply ducts with milk¹.

Prevalence of breast cancer in India is 25.8 per 100000². When cancer cells metastasize to nearby tissues or to distant areas of the body it is known as malignant tumor³. When cancer cell grows but does not spread it is known as benign tumor. There are many risk factors such as sex, aging, estrogen, family history, gene, unhealthy lifestyle which increases the risk of developing breast cancer⁴. Since from few years, awareness is increased about breast cancer. Many surgeries are performed to remove the lump. Recently more selective and less invasive methods of treatments are available⁵. Breast cancer treatment includes surgery, chemotherapy,

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radiation, hormone therapy, it can be used alone or with combination. This increases life expectancy for women in breast cancer and they have given special importance to improve quality of life⁶. After the surgeries many complications are seen in that pain, reduced total loss of movements, muscle strength, reduce flexibility, postural changes, scarring complications, sensitivity alterations⁷. Many breast cancer survivors reported significant limitations in upper body strength which is important for daily life activities such as pushing, lifting and reaching to an object especially problematic for the Indian women⁸. Patients having difficulty to completing task. Also it affects on patients quality of life. 18- 23% of breast cancer survivors have muscle weakness of upper limb. Chemotherapy shows a loss of muscle mass⁹. The muscle weakness can also progress and lead to loss hand function.¹⁰ Mainly in the breast cancer management muscles of shoulder complex are involved which causes difficulty in moving hand. In breast cancer management pectoral muscles, rhomboid, serratus ant, trapezius are important which causes difficulty in flexion, abduction, internal rotation of the shoulder joint. ¹¹ Graded Thera-band exercises have shown interesting effects in reducing fatigue levels, improve functional capacity, and muscle strength and inducing positive changes in body composition which shows direct effect on patients quality of life. This graded Thera-band exercises is useful in improving functional capacity, muscle strength

and hand mobility. Thera-bands are cost effective, easy to handle, portable, and versatile. Theraband exercises are very easy and simple, hence patient can do easily at home also.

Materials and Method

It was an interventional study which was carried out in Krishna hospital, Karad. The study duration was the 6 months. The study was conducted in Krishna Hospital, Karad. An informed consent was taken from the subjects who were included in the study. Total numbers of subjects included in the study were 40, this sample size was calculated using formula $n = 4pq/L^2$. Subjects were taken by using simple random sampling techniques. The duration of the study was 6 months, and the treatment was given for 30 minutes per day and 5 days / week. All the subjects were included in this study based on inclusion criteria. An inclusion criterion includes breast cancer survivors, stage I and stage IIA. Histological confirmed breast cancer survivors with no evidence of recurrent or progressive disease since last six months. Completed surgery, radiotherapy and or chemotherapy. Females with age between 40 to 55 years. Breast cancer survivors receiving hormone therapy. An exclusion criteria includes breast cancer survivors with known case of fracture dislocation, stroke, peripheral neuropathy, skin diseases. Infections in the axillary area. Materials used in this study are Thera-band, SPADI Questionnaire and Goniometer.

| Thera-band colour | Resistance level | Workout level |
|-------------------|------------------|-----------------------|
| Yellow | Thin | Beginner |
| Red | Medium | Beginner/intermediate |
| Green | Heavy | Intermediate |

All the exercises are started with 2-3 sets of 10-15 repetitions. Gradual progression to next colour when breast cancer survivors is able to easily complete 3 sets of 10-15 repetitions.

1. The Shoulder Pain and Disability Index (SPADI) is the self-administered questionnaire that consists of two dimensions, one for pain and the other for functional activities. The pain dimension consists of five questions

related to severity of pain. Functional activities are assessed with eight questions design to measure the difficulty an individual has with various activities of daily living that require upper extremity use.

2. Manual Muscle Testing (MMT): It is the method of diagnostic evaluation used by physiotherapist. It is the important part of physical therapy examination which is useful in differential diagnosis and treatment of musculoskeletal and neuromuscular disorders. It is graded from 0-5 which is determined by the patients capability to move tested body part depending upon muscle contractility, gravity assisting and antigavity positions.

Procedure

The study was conducted to find out the effect of graded theraband exercises on myofascial dysfunctions in breast cancer survivors. After getting ethical approval from the institutional ethical committee of Krishna institute of medical sciences "Deemed To Be University", Karad. The total 40 subjects were selected as per inclusion and exclusion criteria. All the subjects were assessed for disabilities of the shoulder function and strength, mobility of the shoulder complex before intervening with the treatment. Subjects were explained about the procedure and importance of the study. The subjects received exercises of shoulder flexion, extension,

abduction, adduction, internal rotation, external rotation by using theraband. All the exercise started with 2-3 sets of 10-15 repetitions. The exercise started with the yellow colour theraband and progressed to red and then green colour. Progression to next colour considered when individual was able to easily complete 3 sets of 10-15 repetitions. The study was done 5 times per week for 8 weeks. After the 8 weeks the post treatment assessment for shoulder range of motion, disability and strength by using SPADI Questionnaire, goniometer, MMT. After that the subjects taken for statistical analysis and the result of the study was done on the basis of comparing pre and post-test assessment. The study resulted by statistical analysis of the entire outcome measures.

Statistical Analysis

Statistical analysis was done manually and by using instat software to verify the result. The statistical analysis was done by using paired T-test. P and T test was calculated by using instat software. Effect of graded theraband exercises on myofascial dysfunctions in breast cancer survivors was analysed.

Result

Data Presentation

Table no.1 Sociodemographic data

| AGE | PRESENT | PERCENTAGE |
|-------------------|---------|------------|
| Above 50 | 23 | 57.5 |
| Below 50 | 17 | 42.5 |
| PAST HISTROY | PRESENT | PERCENTAGE |
| | 23 | 57.5 |
| TREATMENT HISTROY | PRESENT | PERCENTAGE |
| Radiotherapy | 2 | 5 |
| Chemotherapy | 12 | 30 |
| Hormonal therapy | 5 | 12.5 |
| Surgery | 21 | 52.5 |
| WORKING STATUS | PRESENT | PERCENTAGE |
| Workers | 19 | 47.5 |
| Non-workers | 21 | 52.5 |
| HABBITS | PRESENT | PERCENTAGE |

Cont... Table no.1 Sociodemographic data

| | | |
|-------------------|----------------|-------------------|
| Masheri | 26 | 65 |
| Tobacco | 7 | 17.5 |
| Cigarette | 0 | 0 |
| Alcohol | 2 | 5 |
| OBESITY | PRESENT | PERCENTAGE |
| Obese | 27 | 67.5 |
| Non-obese | 13 | 32.5 |
| POPULATION | PRESENT | PERCENTAGE |
| Urban | 16 | 40 |
| Rural | 24 | 60 |

INTERPRETATION: Above table represents sociodemographic data that includes age, treatment history, habits, working status, obesity and past history; which gives information about patients history.

Table no. 2: shoulder manual muscle testing.

| | Flexion | Extension | Abduction | Adduction |
|------|----------------|------------------|------------------|------------------|
| Pre | 1.8 | 1.8 | 1.8 | 2.25 |
| Post | 2.9 | 2.9 | 3.2 | 3.3 |

INTERPRETATION: Above table shows pre and post comparison within the group .post treatment showed significant improvement seen in strength of shoulder according to prevalence rate.

Table no. 3: shoulder range of motion.

| | Flexion | Extension | Abduction | Adduction |
|------|----------------|------------------|------------------|------------------|
| Pre | 99.3 | 19.6 | 99.4 | 24.3 |
| Post | 140.8 | 25.8 | 113.1 | 38.3 |

Interpretation: The above tables shows pre and post comparison of the treatment. Post treatment showed significant improvement in shoulder range of motion.

Table no. 4: The Shoulder Arm Disability Index (SPADI)

| Pre test | Post test |
|-----------------|------------------|
| 81 | 72.9 |

Interpretation: Above table shows pre and post comparison within the group. Post test showed significant improvement seen in shoulder mobility by using SPADI questionnaire.

Discussion

Many studies are undertaken to find out the prevalence rate of myofascial dysfunctions but there was not awareness about the rehabilitation programme. This dysfunction have direct relation with the QOL of breast cancer survivors that's why it was necessary to put some light on rehabilitation programme. It will help to improve QOL and functional mobility in breast cancer survivors. Knowing about the importance of the research, this topic has been approved by institutional ethical committee and there after research began. Sample size included in this study was 40 females which was selected by simple random sampling techniques who are undergone breast cancer management. After that the protocol is given to each patient and explain about all the information and importance of the study. This study is on "effect of graded thera -band exercises on myofascial dysfunctions in breast cancer survivors" was conducted to find out the effect of strengthening with thera-band and find the effect on muscles strength and arm mobility. Breast cancer survivors have shown interesting effect to decrease fatigue level, improve functional capacity and muscle strength. Graded thera -band exercises showed improvement in SPADI scores with prevalence rate <0.0001 and showed improvement in shoulder movements. The result showing that strengthening with thera-band showed better effect compared to previous status of breast cancer survivors. Also graded thera-band exercises helps to improve patients quality of life. Thera-band strengthening exercises have been shown to be practicable alternative to weight cuffs and other strength training methods. Thera-bands are easily available in hospitals and physiotherapy clinics. This thera -bands easy to use, breast cancer survivors can also do all the exercises at home also. When comparing this research with previous studies, Ausanee Wanchai (2018) concluded that resistance exercises is beneficial for effective lymphedema management.¹² Where in our study exercise programme is focused on myofascial dysfunctions related to upper body which shows better effect and progression in health status of breast cancer survivors. Roger T. Andreson showed that many of the studies used manual resistance exercises.¹³In which the resistance is applied by the therapist, where in our study resistance force is applied by the thera- bands which are easy to handle and more convenient. Cornie et al. concluded that progressive resistance exercises

significantly improved muscle strength, muscle endurance and quality of life in women with breast cancer related lymphedema.¹⁴ In present study thera-band exercises started earlier in breast cancer survivors. When the body system are started exposed to a greater than usual but proper level of resistance, they react with a number of acute physiological response and later adapt to the newly imposed physical demands. In thera-band exercises, the speedy get to in tension producing capacity of skeletal muscles is largely attributed to neural responses not adaptive muscle changes itself. All of this response might have contributed in improvement in SPADI questionnaire. Comparably high levels of muscle activation during exercises are achieved resistance training with elastic products than weights and it is feasible alternative to training with machines and heavy weights. Also, resistance training with thera-band is subjective force as the subject might stretch minimally or as tolerated the initial few days and as neural and muscle adaptation occurs may more stretch more to experience more resistance. Which will eventually add to increase in flexibility and strength, which isn't the case in traditional weights as the resistance cannot be altered. Although it is known that regular exercises and physical activity can improve health related status of the breast cancer survivors. There is a critical need for developing correct treatment and early rehabilitation protocols related to myofascial dysfunctions which causes negative effect on patients health status.¹⁵To improve activity of daily and quality of life graded theraband exercises are needed.

Conclusion

The present study concluded that the thera-band exercises improved better strength than the previous status of breast cancer survivors. All the activities of daily living also improved and that is confirmed again with the SPADI questionnaire.

Conflicts of Interest: The authors declare that there are no conflicts of interest concerning the content of the present study.

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Abbreviations:

MMT: Manual Muscle Testing

ROM: Range of Motion

SPADI: Shoulder Pain and Disability Index

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