Original Article

Effect of Task Oriented Approach on Cancer Related Fatigue and Functional Capacity among Subjects with Blood Leukaemia

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Abstract

Background: Cancer is the second leading cause of mortality worldwide.19.3 million new cases and 10.3 million deaths from cancer were reported worldwide. Cancer-related fatigue (CFR) has a complicated aetiology. Fatigue has a more detrimental influence on daily tasks and quality of life (QoL) than other ailments like pain or grief. This study aimed to determine the effect of task oriented approach on cancer related fatigue and functional capacity among subjects with blood leukaemia.

Methods: A randomised, clinical trial was conducted with a total of 30 blood cancer survivors. Subjects were randomised into a radiation therapy group (RT group) (n=15) and non-radiation therapy group (NRT group) (n=15). Both groups included a task oriented approach for 1section/day, 5 days /week for 4 weeks. The main outcome was fatigue as assessed by the Brief fatigue inventory, Other evaluated outcomes were functional capacity and Quality of life measured using 6 minute walk test and EORTC QLQ C30 (Version 3) . Data were collected at baseline and post-intervention.

Result: There is a significant improvement in both group in cancer related fatigue after the intervention, two groups, non-radiation group show much better improvement comparing to participants under radiation with a mean difference of 3.4 in Brief Fatigue Inventory, 5.93 in 6 minute walk test, 16.46 in EORTC QLQ C30 (Version 3).

Conclusion: It has been concluded that Task oriented approach has better effect on reducing the fatigue caused by cancer and enhancing the functional capacity, quality of life among blood leukaemia individuals. Participants who are not under radiation therapy have better prognosis than participants under radiation therapy.

Keywords: EORTC QLQ C30 (Version 3), Task oriented approach, Radiation or Non-radiation therapy, Fatigue, Blood Cancer.

Introduction

Cancer is an unchecked cell proliferation that has the potential to spread to other bodily areas. According to the type of cancer, the mortality rates of the various cancers vary[1]. While rates varied greatly between countries, globally, the incidence rate for all malignancies combined was 19% higher in males (222.0 per 100,000) than in women (186 per 100,000) in 2020[2]. With over 1 lakh people receiving a blood cancer

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diagnosis each year, blood cancer has become one of the leading causes of mortality in India. Leukaemia accounted for 309,006 cancer fatalities and 437,033 new diagnoses in 2018, ranking as the 15th most often diagnosed cancer and the eleventh leading global cause of cancer-related mortality. The prevalence of the leukaemia disease is higher in men than in women worldwide. Male mortality was also greater than female mortality (4.2 per 100,000 versus 2.8 per 100,000)[3]. According to GBD estimates, population growth and aging were responsible for 97% of the increase in leukaemia incidence from 2005 to 2015, which was a global increase of 26%[4]. The estimated number of cancer cases in India is 600,000[5]. One of the frequent and the toughest symptoms reported by cancer sufferers is cancer-related fatigue (CRF). "NNCN (The National Comprehensive Cancer Network) defines CRF as "a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning"[6].After the end of treatment, CRF may continue for up to 5 years or even longer[7-9]. Even though the cause of CRF is uncertain, some molecular factors, including Pro-inflammatory cytokines, dysregulation of the hypothalamus -pituitary-adrenal axis[10], circadian rhythm desynchronization, skeletal muscle atrophy and genetic dysregulation, have been proposed[11]. The subsequent CRF risk elements were discussed in Bower[12]: inherited dangers (like single nucleotide polymorphisms), psychological warning symptoms (like melancholy), and psychological risk factors (like bodily inactivity). Exercise may focus on some of these elements. For instance, resistance training can prevent the wasting of skeletal muscle. In the 'Implementing Evidence in Practice' tool from the Oncology Nursing Society, work out and bodily activity were recommended as an initial-line therapy for CRF[13]. CFR has a complicated aetiology. Reduced physical activity and circumstances connected to the illness or its treatment combine to cause it. The continuation of physical activity is crucial in the management of weariness. Applying certain physiotherapy helps patients become more active, feel less worn out, as well as enhance their functional status, all of which directly enhance their QoL[14]. Work out and other non-pharmaceutical therapies have been used to lower CRF during and after treatment for the majority of cancer types[15]. Certain studies have shown that there is the efficiency of aerobic activity, exercise with resistance to cancer related fatigue but the concentration and attention of the patients during these exercises were questionable.

Aim

The aim is to determine the effect of task oriented approach on cancer related fatigue and functional capacity among subjects with blood leukaemia.

Material and Method

It was an experimental study, conducted from June 2022 to January 2023. Total of 64 blood leukaemia patients were screened for study. 30 samples were selected according to the inclusion and exclusion criteria.

Inclusion Criteria:

- Both males and females.
- Patients stage of I, II in rai staging system (American cancer society staging).
- Patients scoring mild to moderate in the scale of Brief Fatigue Inventory were included.

Exclusion criteria:

- People with recent fractures.
- People with other comorbidities like neurological and psychological impairments were excluded.

Outcome measures:

Assessment was performed at baseline and after 4 weeks of study.

- Brief Fatigue Inventory[16]
- 6 Minute walk test[17]
- EORTC QLQ C30 (Version 3)[18]

Procedure:

The aim and objective of the study were explained to them, and a written informed consent form was obtained. The mean age of participants is 44.6 ± 5.32. Out of 30, 18 were male, 12 were female. All participants were divided into two groups according to their treatment protocol and the group is named as the radiation therapy group (RT group) and non-

radiation therapy group (NRT group) Task oriented approach will be explained and demonstrated. Pre-test and post-test value of Brief Fatigue Inventory, Six minute walk test and lifestyle quality by using EORTC QLQ C30 (Version 3) were calculated and tabulated. The intervention is given to the subjects for 1 section/day, 5 days /week for 4 weeks. Exercises are Mentioned in the below Table 1: Task Oriented Approach

Exercise	Description
1. Stand and Reach	Standing and reaching in various directions for things that are farther away from the body to encourage loading of the lower limbs
2. Catch and throw	A soft ball will be thrown towards the person; he/she collects it and throws it back.
3. Sit to stand	Use different chair heights to sit and stand to build strength
4. Dodgeball	A soft ball is given to participants, they were asked to throw the ball over each in aim to hit his/ her opponent and
5. stepping forward and backward	stepping up and down on various heights of blocks
6. Stepping sideways	stepping sideways into various heights of blocks
7. Forward step-up onto blocks	Stepping up forward onto various-height blocks
8. Heel(s) raise and lower	Raising and lowering the heel(s) while maintaining a standing position

Fig 1: Stand and Reach

Fig 2: Heel(s) raise and lower

Data Analysis and Result:

Total of 30 blood leukaemia survivors met the inclusion criteria and were randomly allocated into two groups using an opaque concealed envelope (NRT, n = 15; NRT, n = 15) with no dropouts or losses to follow-up No intergroup differences were observed at baseline. Pre, post mean, standard deviation, Z- score, p-value were presented in table using Brief Fatigue Inventory.

BRIEF FATIGUE INVENTORY for NRT Group					
NON - RADIATION GROUP (NRT)					
MEAN		SD		Z Score	P Value
Pre	Post	Pre	Post		
7.86	4.46	0.83	1.12	3.78	<0.01
6 MINUTE WALK TEST For NRT Group					
NON - RADIATION GROUP (NRT)					
MEAN		SD		Z Score	P Value
Pre	Post	Pre	Post		
336.45	385.23	8.23	144.23	4.23	<0.01
EORTC QLQ C30 (Version 3) for NRT Group					
NON - RADIATION GROUP (NRT)					
MEAN		SD		Z Score	P Value
Pre	Post	Pre	Post		
94.26	77.8	2.86	4.79	3.40	<0.01

Inventory, 6 minute walk test and Quality of life in table (1-6) respectively. There is a significant improvement in both group in cancer related fatigue after the intervention, two groups, non-radiation group show much better improvement comparing to participants under radiation with a mean difference of 3.4 in Brief Fatigue Inventory, 5.93 in 6 minute walk test, 16.46 in EORTC QLQ C30 (Version 3).Result Data were mentioned in Table 2 & 3.

Table 2: Mean, SD, Z score and P Value for NRT Group Table 3: Mean, SD, Z score and P Value for RT Group

BRIEF FATIGUE INVENTORY for RT group.					
RADIATION GROUP (RT)					
Mean		SD		Z Score	p Value
Pre	Post	Pre	Post		
8.6	5.46	0.88	1.18	3.295	<0.001
6 MINUTE WALK TEST for RT group.					
RADIATION GROUP(RT)					
Mean		SD		Z Score	p Value
Pre	Post	Pre	Post		
315.9	365.5	6.57	12.82	3.35	<0.001
Mean, SD, Z score and P value using EORTC QLQ C30 (Version 3) for RT group.					
RADIATION GROUP(RT)					
Mean		SD		Z Score	P Value
Pre	Post	Pre	Post		
98.86	85.06	3.18	3.19	3.42	<0.001

Discussion

The present study evaluated the effect of task oriented approach for both groups consisting of NRT and RT group on cancer related fatigue, functional capacity and lifestyle quality in Blood leukemia survivors suffering from CRF. An improvement in exhaustion, practical ability and lifestyle quality was observed of blood leukaemia survivors who underwent Task Oriented Approach with NRT rather than RT. One of the frequent adverse consequences of cancer is fatigue, which is more common in people with blood leukaemia than other cancer types. Exercise adherence in cancer patients is very low due to complexity of those exercises. Cancer related fatigue has an impact on reduced functional capacity in turn reduces quality of life. Author Virginia Prieto-Gómez in her study states supervised therapeutic exercise has better improvement in fatigue and function capacity in breast cancer survivors, our study also converges into that result stating task oriented exercise has a better effect on fatigue and functional capacity among blood leukemia survivors. One of the most universal and distressing cancer manifestations is exhaustion, which has a negative impact on one's lifestyle quality. Cancer-related fatigue (CRF) has an unclear pathogenesis, but it is likely complex and involves interconnected cytokine, muscle, neurotransmitter, and neuroendocrine alterations in every individual. The central and peripheral hypotheses that underlie the postulated CRF processes. Adenosine triphosphate and the capabilities of muscles to contract are related to peripheral mechanisms, whereas theories regarding the dysregulation of cytokines, disruption of the hypothalamic-pituitary-adrenal axis, disruption of the biological rhythms, 5-hydroxytryptamine, and vagal afferent nerve function are related to central mechanisms. These theories are currently largely supported by data from other illnesses where fatigue is a common symptom. Understanding pathophysiology may help with straightforward treatment strategies for cancer patients[19]. Agarwal S et al (2020), did a study of cross- sectional descriptive study examined the prevalence, predictors and effects of CFR on patients of palliative cancer with advanced cancer revealed that, Indian patients with advanced cancer who were receiving palliative care had a significant prevalence of fatigue, which had a detrimental effect on QOL. Albumin was discovered to be an independent predictor of CRF, as were pain, physical functioning, performance status, and albumin[20]. Banipal RPet al (2017), done a cross- sectional observational study on cancer related fatigue with cancer patients undergoing many treatments, revealed that cancer survivors have substantial levels of fatigue and it has to be assessed earlier once the patient is diagnosed with cancer before the treatment starts[21].

Patel JG et al (2017), said about aerobic exercise impact in cancer related fatigue states that, Rest and sleep do not always relieve CRF, and the severity of its symptoms is disproportionate to the intensity of actual physical exertion. According to the findings of the study, individuals with solid tumours who engaged in aerobic exercise for six weeks following chemotherapy and/or radiotherapy had a decrease in the type and severity of fatigue[22]. Dermal ridge has been associated with breast cancer and acts as a biomarker of the gene. Exercise or activity is much more important to reduce fatigue. Task oriented approach is a type of exercise which is designed with simple activity which we do in our day to day activities; the adherence of exercise training in this training is high. These exercises can be used in clinical trials too.

Conclusion

According to the above result it has been concluded that a task oriented approach has a better effect on reducing the cancer related fatigue and improving functional ability, quality of life among blood leukaemia individuals. Participants who are not under radiation therapy have better prognosis than participants under radiation therapy.

Conflicts of interest: There are no conflicts of interest.

ISRB clearance:

ISRB clearance was taken from the institutional ethical committee.

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