

“Effectiveness of yoga on patients with chemotherapy induced cognitive impairment (CICI) in lung cancer at tertiary care center, Mumbai-A pilot study”.

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ABSTRACT

INTRODUCTION

Lung cancer is the most prevalent cancer globally. In 2022, there were 2,480,675 new cases of lung cancer globally. In 2022, India was placed 4th with a total of 81,748 cases. Chemotherapy-induced cognitive impairment (CICI), commonly known as "chemo brain" or "chemo fog," is an adverse effect that manifests during and after chemotherapy, characterized by difficulties in memory, attention, concentration, processing speed, and executive functions. CICI affects up to 75% of patients during the period of chemotherapy and about 35% patients suffer for several months post chemotherapy.

Exercises such as super brain yoga, bhastrika, kapalabhati, bhrumari and siddha walk increases blood flow to the brain improving oxygenation thus stimulating and boosting cognitive clarity.

OBJECTIVES

- To assess the effect of yoga on patients with chemotherapy induced cognitive impairment in lung cancer receiving third or fourth cycle of chemotherapy.
- To identify the degree of cognitive impairment and to see the trend of changes in cognition measured by ACE III among patients with lung cancer at tertiary care center.
- To compare the association between the cognitive function and the clinical data of patients with lung cancer at tertiary care center.

METHODOLOGY

The study enrolled 30 lung cancer patients receiving third or fourth cycle of chemotherapy by using non-probability convenient sampling technique and design as quasi-experimental one group pre-post design. Intervention consisted of yoga containing 5 exercises such as super brain yoga, bhastrika, kapalabhati, bhrumari and siddha walk were performed 3 times a day for a period of 30 days were assessed for effectiveness of yoga by using ACE III tool. The statistical evaluation was done by Friedman Test for effectiveness of yoga, Chi Square Test to identify the degree of cognitive impairment and Wilcoxon Signed rank Test to see the trend of changes in score from day 0 to day 21, from day 21 to day 30 and from day 0 to day 30.

RESULTS

The mean attention score was 13.76 on day 0, 14.72 on day 21 and 14.90 on day 30. The mean memory score was 11.07 on day 0, 13.86 on day 21 and 14.69 on day 30. The mean fluency score 7.72 on day 0, 9.76 on day 21 and 10.48 on day 30. The mean language score was 16.66 on day 0, 17.69 on day 21 and 17.97 on day 30. The mean visuospatial score was 9.45 on day 0, 10.97 on day 21 and 11.45 on day 30. The p-value for attention, memory, fluency, language and visuospatial score were found statistically highly significant ($p < 0.001$).

CONCLUSION

The result of the study suggests that yoga is effective in improving attention, memory, fluency, language and visuospatial domains of cognition which can improve quality of life of patient and in executive functions in daily life.

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OBJECTIVES

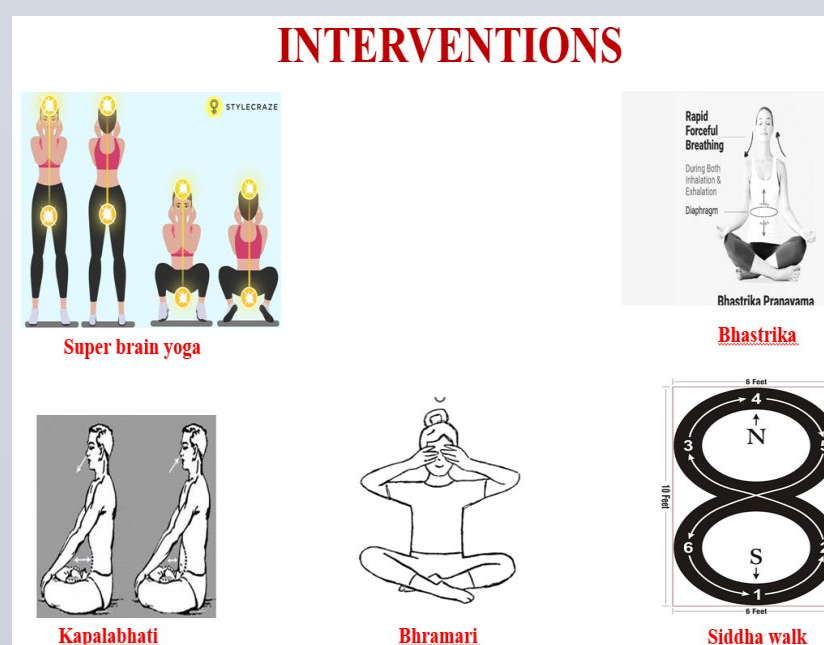
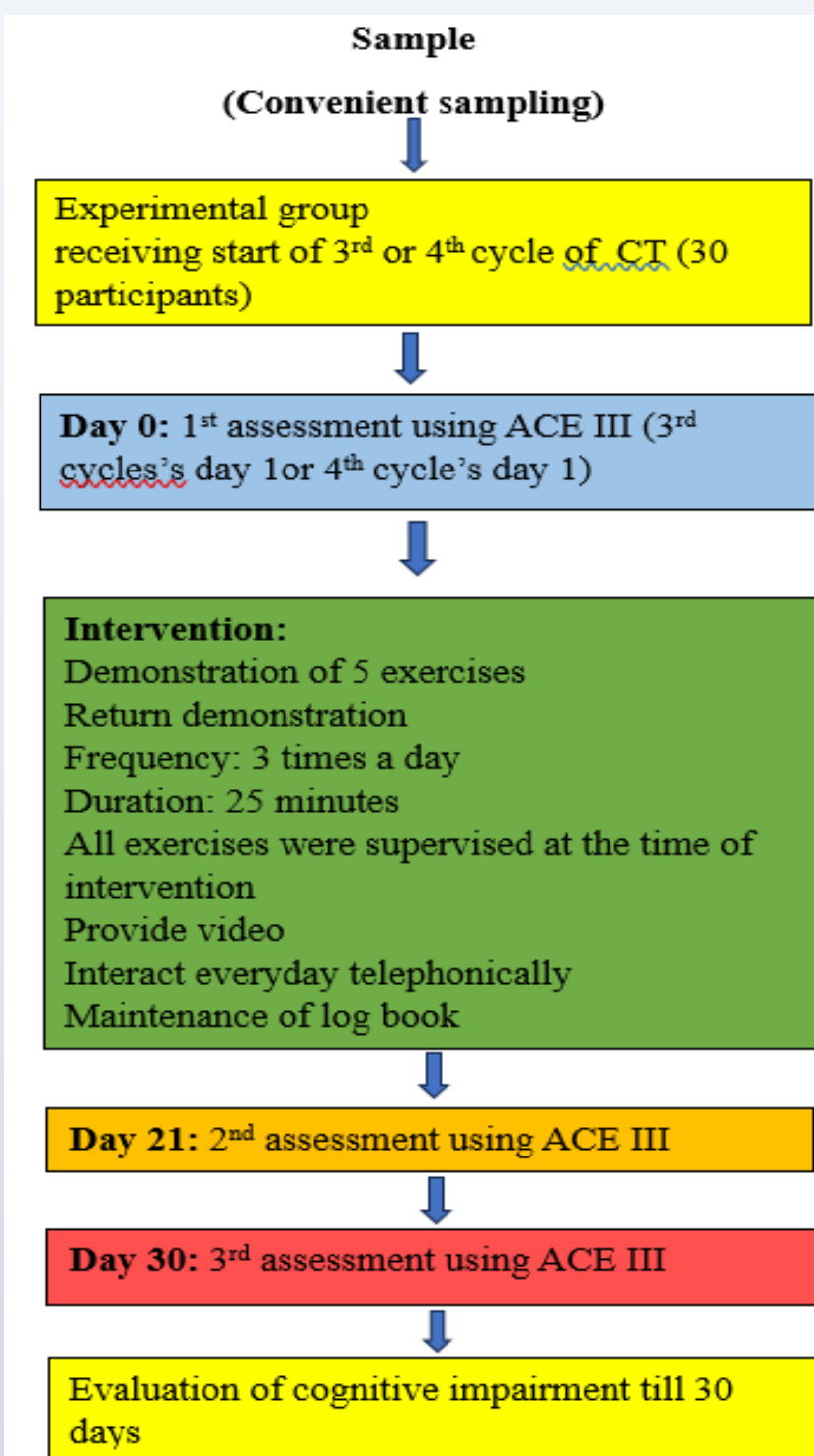
Primary objective:

To assess the effect of yoga on patients with chemotherapy induced cognitive impairment in lung cancer patients receiving third or fourth cycle of chemotherapy.

Secondary objectives:

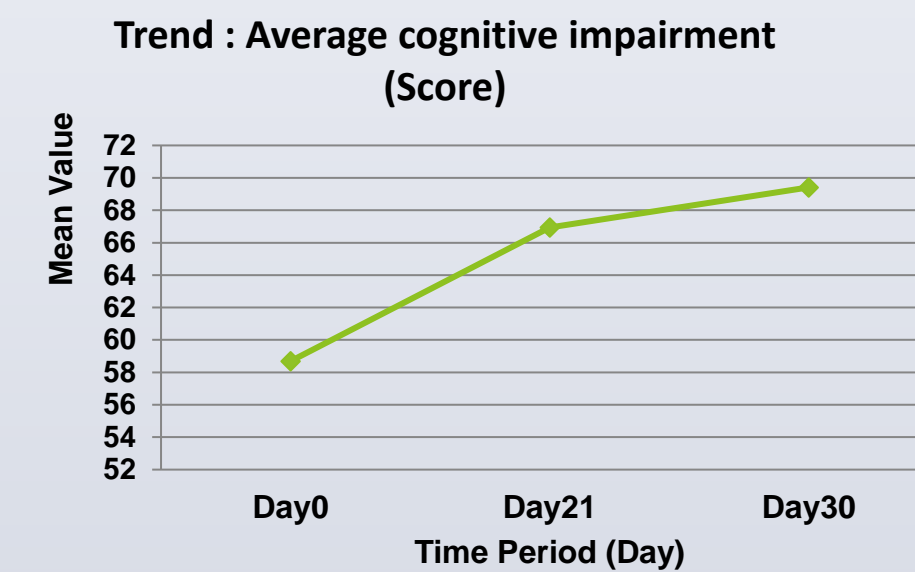
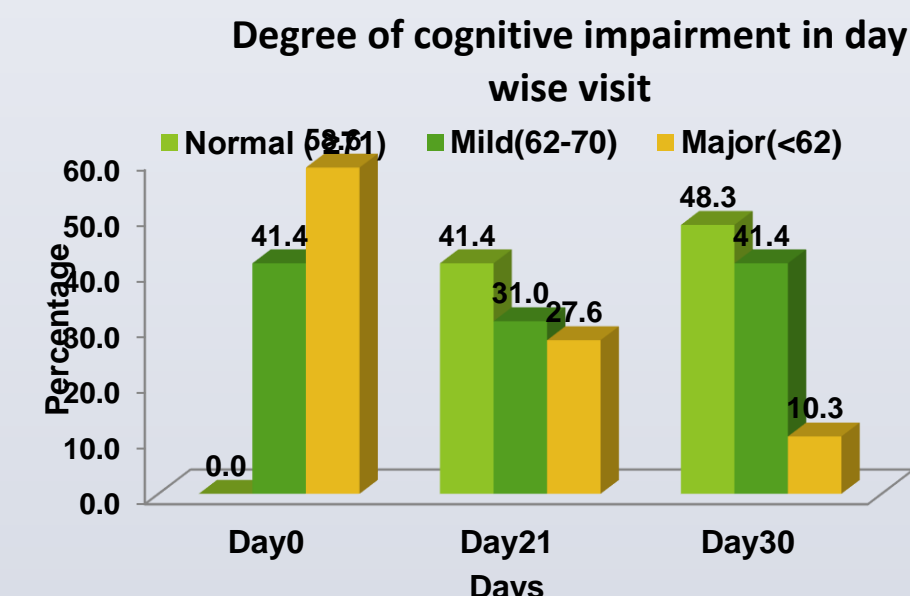
- To identify the degree of cognitive impairment and to see the trend of changes in cognition measured by ACE III scale among patients with lung cancer at tertiary care center.
- To compare the association between the cognitive function and the clinical data of patients with lung cancer at tertiary care center.

METHODOLOGY



RESULTS

Assessment		Day0		Day21		Day30		Friedman Test	P- Value	Sig. at 5% level
Domain wise	N	Mean	Stdev	Mean	Stdev	Mean	Stdev			
Attention Score	29	13.76	2.63	14.72	2.02	14.90	2.04	22.656**	P<0.001	Yes
Memory Score	29	11.07	3.38	13.86	3.47	14.69	3.16	37.232**	P<0.001	Yes
Fluency Score	29	7.72	1.91	9.76	1.38	10.48	1.27	47.319**	P<0.001	Yes
Language Score	29	16.66	2.47	17.69	2.88	17.97	2.96	19.283**	P<0.001	Yes
Visuospatial Score	29	9.45	2.67	10.97	2.51	11.45	2.44	32.066**	P<0.001	Yes
Total Score	29	58.69	8.63	66.93	8.28	69.41	8.26	45.243**	P<0.001	Yes



Assess the effect in Day 0		Day 0		Wilcoxon Sum Rank Test	P- Value	Sig. at 5% level
Domain wise	N	Mean	Stdev			
Attention Score						
Chemo – Cycle 3	21	14.0476	2.7473	0.986	0.324	Not
Chemo – Cycle 4	8	13.0000	2.2678			
Memory Score						
Chemo – Cycle 3	21	10.3810	3.2477	1.671	0.095	Not
Chemo – Cycle 4	8	12.8750	3.2266			
Fluency Score						
Chemo – Cycle 3	21	7.6190	1.6576	0.548	0.584	Not
Chemo – Cycle 4	8	8.0000	2.5635			
Language Score						
Chemo – Cycle 3	21	17.0000	2.2583	1.063	0.288	Not
Chemo – Cycle 4	8	15.7500	2.9155			
Visuospatial Score						
Chemo – Cycle 3	21	9.3810	2.5588	0.495	0.621	Not
Chemo – Cycle 4	8	9.6250	3.1139			
Total Score						
Chemo – Cycle 3	21	58.4286	8.0534	0.513	0.608	Not
Chemo – Cycle 4	8	59.3750	10.5822			

DISCUSSION

Babakhani M in his study, super brain yoga for a period of one month has shown effective for haemodialysis patient. The mean scores for cognitive function, urea, creatinine, and dialysis adequacy were 26.07 ± 3.72 , 133.83 ± 34.19 , 9.37 ± 2.55 , and 1.22 ± 0.24 in the control group, and 28.97 ± 1.62 , 174.17 ± 52.8 , 13.38 ± 4.16 , and 1.26 ± 0.22 in the interventional group, respectively. In our study, super brain yoga along with other four exercises were taught to perform for a period of 1 month and it showed statistically highly significant ($p < 0.001$).

Von Ah D, et al. in their study, the cumulative impact of chemotherapy on cognition in breast cancer patients, involving 60 individuals, indicated that cognitive deterioration typically manifests after the initial chemotherapy cycle and exacerbates with increased chemotherapy exposure. In our study, it is found that there is no association between chemotherapy cycle and cognitive function. The participants receiving either 3rd or 4th cycle of chemotherapy exhibited cognitive impairment and there is no significant differences in scores. It can be the gap between the 2 cycles was only 21 days and the investigator has not followed up throughout the cycles after 4th cycle of chemotherapy.

Janelsins MC et al. in his study done on prevalence, mechanism and possible interventions for CICI on breast cancer patients found that 30% of patients manifested CICI before chemotherapy, 75% throughout treatment and 35% had even manifested after years of treatment. In our study among 29 participants, 17 (58.6%) participants had major neurocognitive disorder (MNCD, score <62) and 12 (41.4%) participants had mild cognitive impairment (MCI, score 62-71) on day 0 receiving 3rd or 4th cycle of chemotherapy.

CONCLUSION

This study was undertaken to assess the effect of yoga on patients with CICI in lung cancer receiving 3rd or 4th cycle of chemotherapy. After the intervention, patients' degree of cognitive impairment was significantly reduced ($P < 0.001$). So, we can recommend it as standard operating practice on patients with chemotherapy induced cognitive impairment in lung cancer.

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