Early initiated postoperative rehabilitation prevents a temporary deterioration in fatigue and HRQoL in patients with operable lung cancer: A randomized trial

Maja Schick Sommer[1], Jette Vibe-Petersen[1], Morten Quist[2]
[1]Copenhagen Centre for Cancer and Health, Denmark
[2]The University Hospitals for Health Sciences, University Hospital of Copenhagen, Denmark

Background

Despite significant improvements in terms of treatment efficacy and tolerability, lung cancer has a disappointing long-term survival rate and patients are generally symptomatic and clinically vulnerable

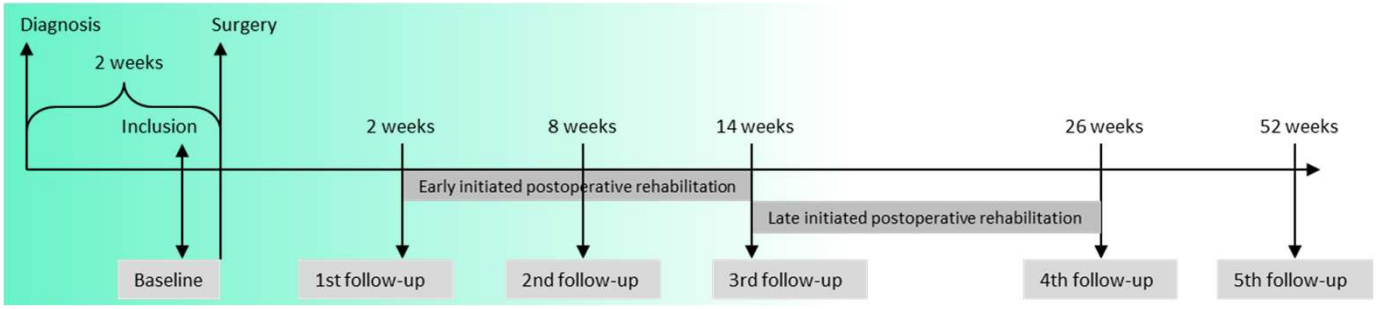
Objective

The Postoperative Rehabilitation in Operation for LUng CAncer (PROLUCA) investigated in a municipality setting the effect of early (14 days) versus late initiated (14 weeks) postoperative rehabilitation in patients with operable lung cancer on exercise capacity, fatigue and Health Related Quality of Life (HRQoL)

Methods

- A two-armed randomized controlled trial with an early rehabilitation group (14 days after surgery (ERG)) or a control arm with a late rehabilitation group (14 weeks after surgery (LRG)) Figure 1 Timeline
- The primary outcome was a change in maximum oxygen consumption (VO_2peak) from baseline to post intervention 26 weeks following lung resection
- Secondary outcomes were measured with EORTC QLQ C30 and FACT-L measured at the following time-points; baseline, 14 weeks, 26 weeks and 52 weeks after surgery

Figure 1: Timeline of the PROLUCA trial



Maja Schick Sommer
Physiotherapist, PhD
Copenhagen Centre for Cancer and Health
E-mail: zr3s@kk.dk
Web: www.kraeft.kk.dk

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Results

- From April 2013 to June 2016 119 patients were randomized to the ERG and 116 to the LRG (figure 2 Flow chart)
- Due to the impact of the surgery a decrease in VO_2peak was expected in both groups from baseline to 14 weeks (table 1)
- The LRG had both a significant decrease in VO_2peak ($p < 0.001$) and deterioration in fatigue ($p=0.017$) (table 1)
- In the ERG there was a minimal but significant ($p=0.027$) decrease in VO_2peak and a minor deterioration in fatigue from baseline to 14 weeks post surgery (table 1)
- In the ERG, HRQoL showed a continuous improvement up to 26 weeks post surgery after which HRQoL decreased after further 26 weeks without structured intervention (figure 3)
- In the LRG results showed a non-significant deterioration over the first 14 weeks post surgery, and an increase in HRQoL after participation in the 12 weeks rehabilitation program, but without reaching the same level as the early group (figure 3)

Figure 2: Flow chart of the study population

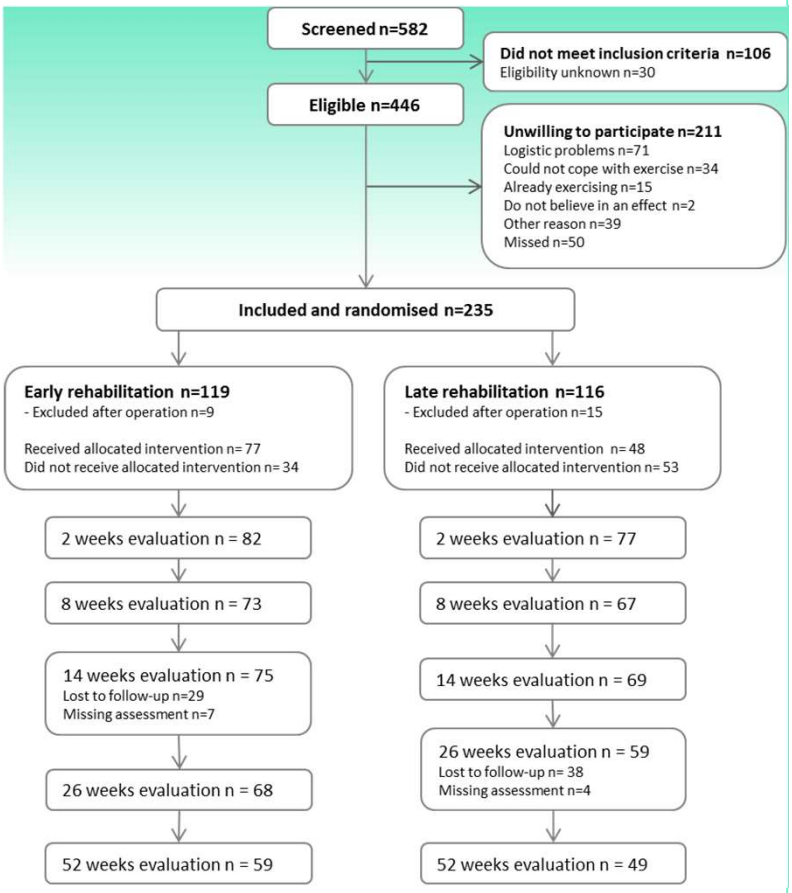

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Table 1. VO2peak is expressed ml O2/min, Abbreviations: SD, standard deviation; CI, confidence interval

Group	N	Mean	SD	N	Mean	SD	change	95% CI	Pr > |t|	Diff.	95% CI	P
					Baseline		**14 Weeks**					
ERG	108	1590	435	69	1503	421	-66	-124 to -7	0.027	-139	-224 to -54	<0.001
LRG	98	1591	526	63	1394	432	-202	-263 to -141	<0.001			
					14 weeks		**26 Weeks**					
ERG	68	1510	407	56	1503	401	17	-34 to 68	0.504	-142	67 to 214	<0.001
LRG	63	1472	445	45	1641	488	159	-104 to -214	<0.001			
					Baseline		**26 Weeks (primary outcome)**					
ERG	108	1612	420	59	1536	462	-46	-104 to 12	0.119	-3	-88 to -82	0.945
LRG	98	1687	521	47	1626	462	-43	-105 to 18	0.167			
					Baseline		**52 Weeks**					
ERG	108	1583	419	50	1510	387	-44	-119 to 31	0.244	11	-96 to 119	0.834
LRG	98	1721	515	44	1639	474	-56	-133 to 22	0.158			

EORTC – C30 Fatique: Score range 0–100 A high score for a symptom scale / item represents a high level of symptomatology / problems

Group	N	Mean	SD	N	Mean	SD	change	95% CI	Pr > |t|	Dif	95% CI	P
					Baseline		**14 Weeks**					
ERG	98	26	24	67	29	21	0	-5 to 6	0.911	10	2 to 18	0.017
LRG	91	31	24	56	38	22	10	4 to 16	<0.001			
					Baseline		**14 Weeks**					
ERG	74	28	19	56	26		-2	-7 to 2	0.278	-7	-14 to -1	0.02
LRG	61	35	21	50	26		-10	-14 to -5	<0.001			
					Baseline		**26 Weeks**					
ERG	98	29	26	56	27		-2	-8 to 4	0.506	-3	-11 to 6	0.551
LRG	91	28	22	53	26		1	-6 to 7	0.850			
					Baseline		**52 Weeks**					
ERG	98	27	27	55	26		0	-6 to 6	0.912	-3	-12 to 5	0.431
LRG	91	27	22	50	27		4	−2 to 10				

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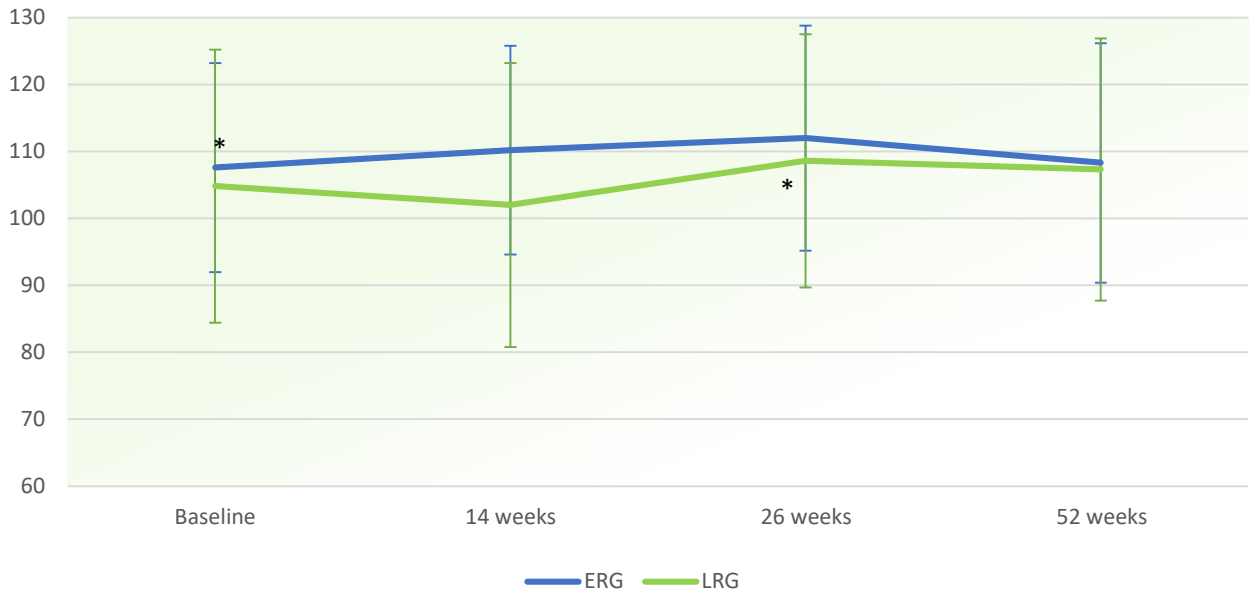
Figure 3 Quality of life FACT-L total score



Scores are presented in mean with standard deviation.
A high score indicate good health-related quality of life-
* Indicates a P-value below 0.05

Conclusion

Early postoperative exercise after lung cancer surgery avoid a temporary deterioration in VO_2peak, fatigue and HRQoL

Clinical impact

To relieve the postoperative burden of lung cancer surgery this study indicates the importance of starting exercise early after surgery

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References

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