

Intravenous vitamin C synergy with mEHT significantly improve QoL and prolong overall survival time in late stage NSCLC patients

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BACKGROUND

Intravenous vitamin C (IVC) and modulated electrohyperthermia (mEHT) are widely used by integrative cancer practitioners for many years.¹⁻³ However, there are no sufficient data in quality of life (QoL), clinical response and survival time of the above treatments in patients with stage III-IV Non-Small Cell Lung Cancer (NSCLC). Our phase I clinical trial proved that IVC simultaneously with mEHT were safe for NSCLC patients.⁴

METHODS

A randomised phase II controlled trial was performed to compare best supportive care (BSC) with and without IVC + mEHT concomitant treatment (In the active arm: patients were given 1 g/kg·d simultaneously with mEHT, three times a week for 25 treatments in total) on tumour size, progression-free survival (PFS) and overall survival (OS) in advanced Chinese NSCLC patients. Subsequently, 97 patients were analysed at the data cut-off (1 May, 2019). Enhanced chest and abdomen CT scans, brain MRI and bone scans were carried out at baseline, and every 4 weeks for the first 12 weeks from the start of the study. Response measurements were carried out according to RECIST 1.1. 3 month disease control rate (DCR) was measured 3 months after the therapy and defined as the percentage of subjects with complete response (CR), partial response (PR) or stable disease (SD) at 3 months relative to all randomly assigned patients.

RESULTS

After a median follow up of 24 months, both the PFS and OS were significantly improved by IVC + mEHT compared to control (PFS: 3 month vs. 1.85 months, $P < 0.05$; OS: 10 months vs. 7.5 months, $P < 0.05$). The average scores for the functioning scales increased continuously, so that the QoL improved in the active arm despite the advanced stage of the disease ($P < 0.05$). 3-month DCR after treatment was 42.9% in the active arm and 16.7% in the control arm ($P < 0.05$). Both interleukin-6 and c-reactive protein were significantly decrease after treatments in active arm in comparison with control arm ($P < 0.05$). However, no significant differences were observed between parameters of adenocarcinoma and squamous cell carcinoma and between EGFR(+) and EGFR(-).

CONCLUSIONS

IVC + mEHT treatment significantly improves QoL, prolongs PFS and OS, and moderates cancer-related inflammation, and so is a feasible treatment for patients with advanced NSCLC. This trial is registered in ClinicalTrials.gov (ID: NCT02655913).

Table 1 Tumour size and DCR

Parameters	Study arm		P value
	Control (n=48)	Active (n=49)	
Number of death (%)	46 (95.8)	30 (61.2)	
PR (%)	0 (0)	7 (14.3)	
SD (%)	8 (16.7)	14 (28.6)	
PD (%)	40 (83.3)	28 (57.1)	
DCR (%)	16.7	42.9	0.0073

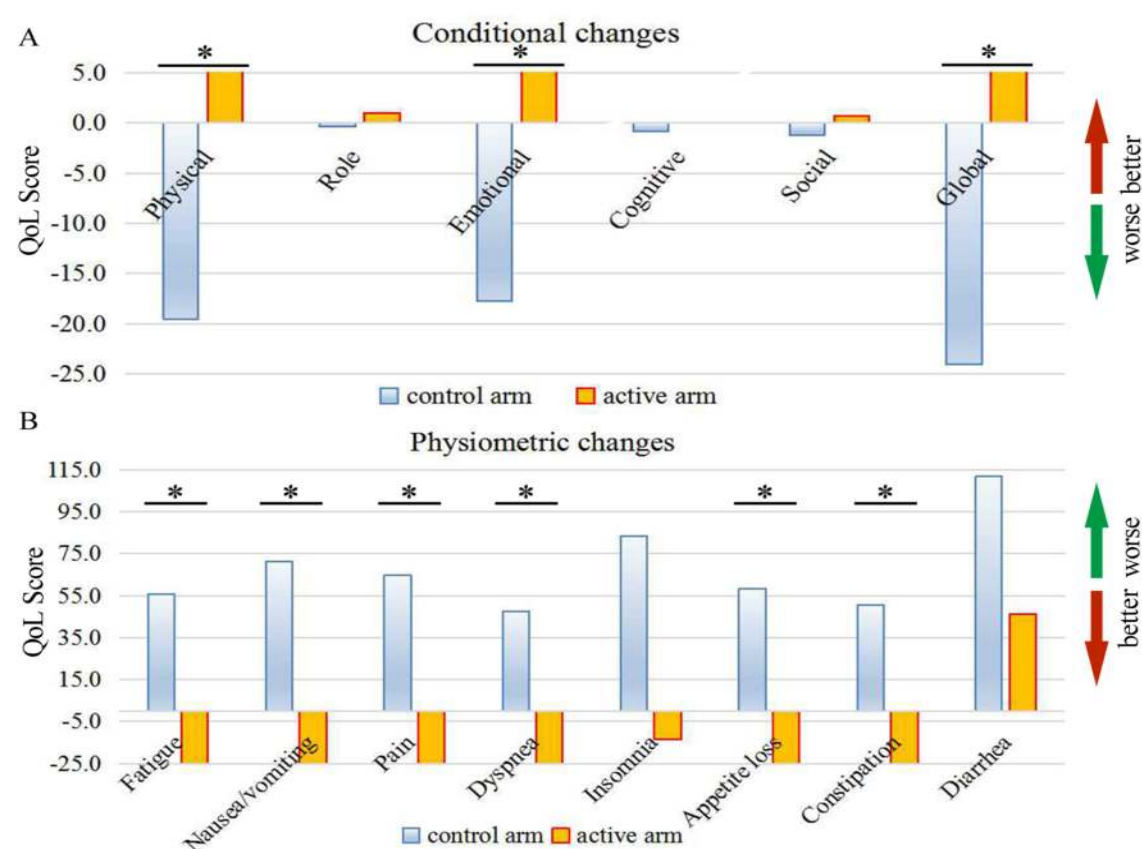


Figure 1 Function subscale(A) and psychometric parameters(B)

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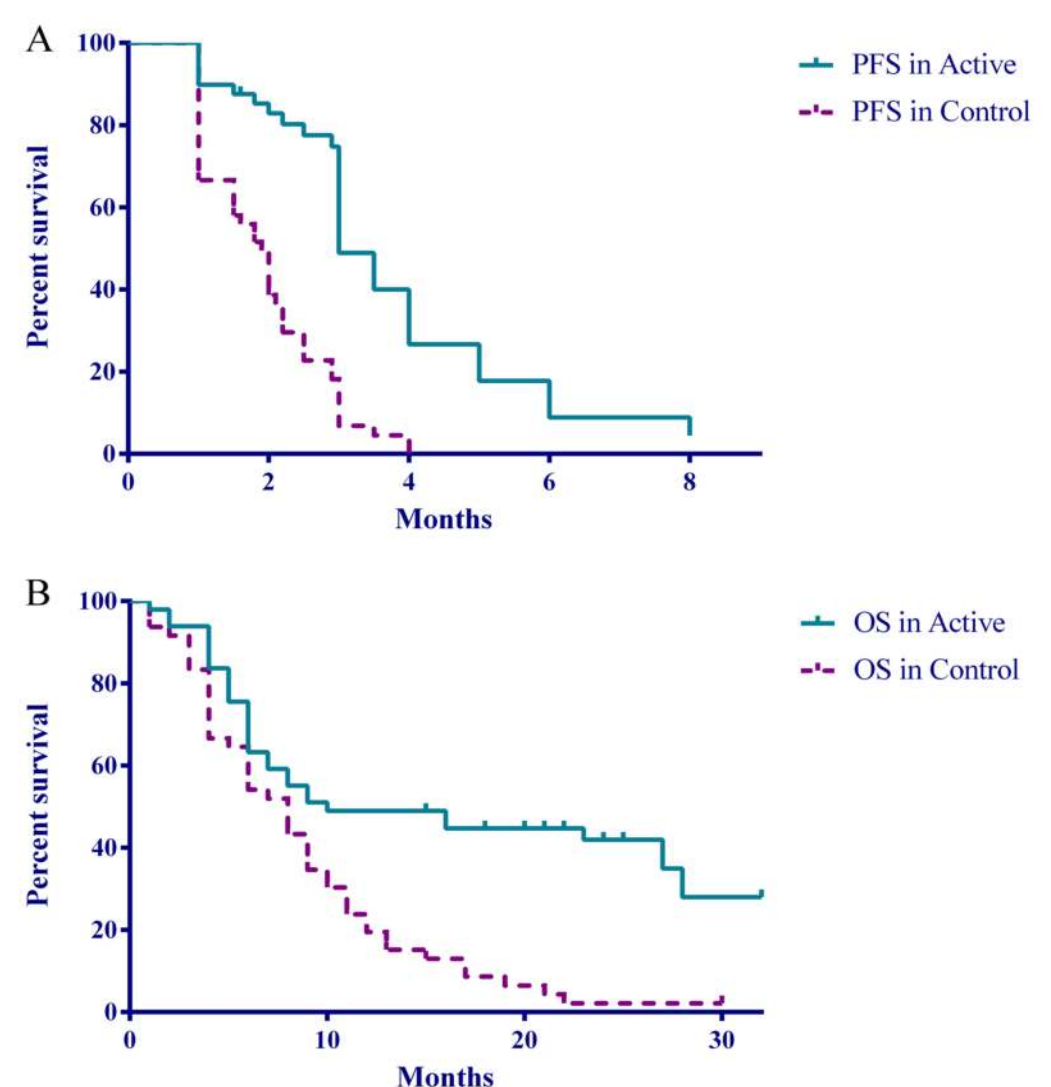


Figure 2 Progression free survival time(A) and Overall survival time(B)