CANCER-RELATED FATIGUE: THE ROLE OF MOBILE TECHNOLOGY IN ASSESSMENT

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BACKGROUND

- Cancer-Related Fatigue (CRF) is common[1]
- Pathophysiology remains poorly understood[2]
- Aetiology central or peripheral: originates anywhere from brain to muscle[3,4]
- Specialized laboratory required to evaluate
- Mobile electromyography (EMG) and wireless electroencephalography (EEG) may allow evaluation in routine clinical setting

OBJECTIVES

1. Determine feasibility & acceptability of mobile EEG-EMG to evaluate CRF in outpatients
2. Correlate subjective and objective fatigue

METHODS

Study Design

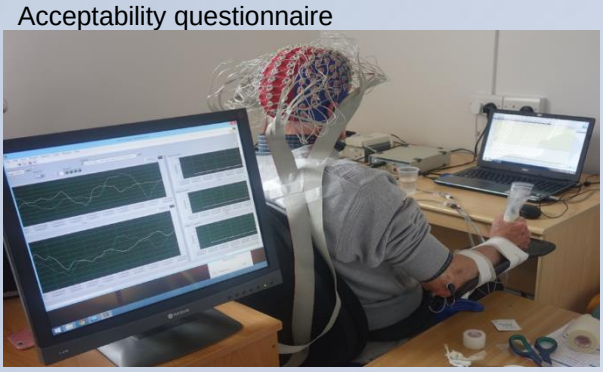
- Prospective observational feasibility study
- Preceded by healthy volunteer pilot (n=10)

Population

- 10 inoperable, treatment-naive, non-small cell lung cancer patients
- Right hand dominant

Data Collection

- Subjective: Brief Fatigue Inventory (BFI)
- Objective: EEG & EMG during right-sided hand-held dynamometer fatigue task
- 2 evaluation stages: First & last 20 secs of task
- Acceptability questionnaire



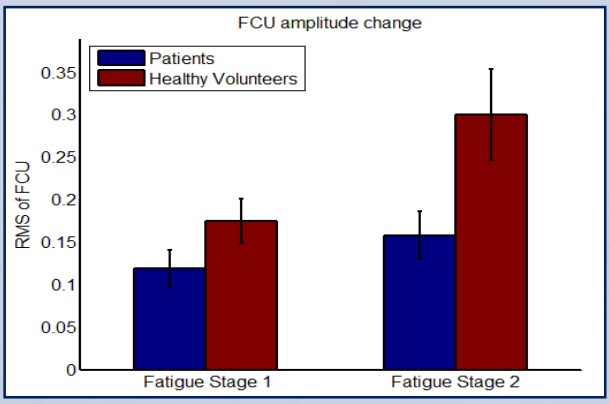
RESULTS

Fatigue Task

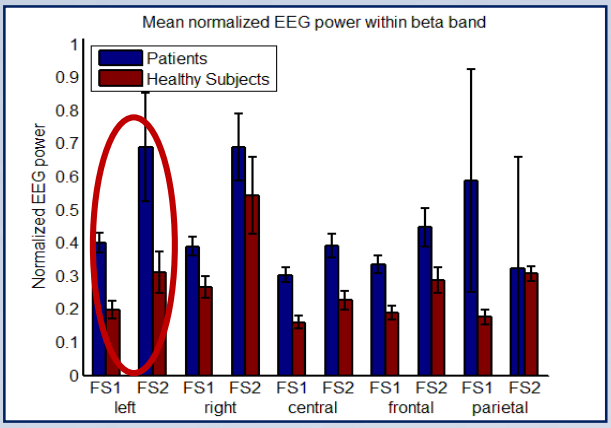
MEASURE	PATIENT	VOLUNTEER
Mean Age*	64	28
Mean BFI*	3.4	1.6
Mean Endurance Time (secs)*	137	208
Mean Maximum Voluntary Contraction (N)*	222	379

*p<0.05

EMG Amplitude



EEG Power



FS1= Fatigue Stage 1 FS2= Fatigue Stage 2

Subjective v Objective

- BFI >3 correlated poorly with objective EEG-EMG measurements

Acceptability

- All patients report acceptable form of evaluation
- Mild EEG discomfort: 2 patients

DISCUSSION

- Mobile EEG-EMG feasible in the outpatient setting
- Cancer patients
  - Perceive physical exhaustion sooner
  - Less voluntary muscle recruitment
  - Higher EEG Power → Lower EMG Response
- Relatively good performance status

CONCLUSIONS

1. Mobile EEG-EMG effectively evaluates CRF
2. High acceptability
3. More central fatigue in cancer patients v volunteers
4. Peripheral muscle abnormalities also evident
5. Further research: a. Longitudinal evaluation
   b. Motor cortex localization

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