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The effects of a 2-week whole-body electromyostimulation in cancer patients

Submission date
06/11/2024

Recruitment status
No longer recruiting

Registration date
07/11/2024

Overall study status
Completed

Last Edited
10/01/2025

Condition category
Cancer

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Various studies show that regular physical activity is an efficient approach to increase medical therapy tolerance and may even improve its effectiveness in cancer patients. However, it is not always possible for patients to perform strenuous and time-consuming exercise programs. For that reason, whole-body electromyostimulation (WB-EMS) may be an interesting alternative form of exercise for cancer patients. In contrast to voluntary muscle contraction caused by small electrical impulses from the central nervous system, WB-EMS generates muscle contraction by an external EMS device. Therefore, the primary aim of this study was to examine whether 2 weeks of WB-EMS exercise are feasible and effective in cancer patients during medical treatment.

Who can participate?
Patients aged over 18 years with different types of cancer and disease stages, undergoing acute therapy and after medical treatment

What does the study involve?
Patients participated in supervised WB-EMS sessions four times over 2 weeks. Before and after the WB-EMS exercise period, patients were assessed regarding physical performance, body composition and patient-reported outcomes.

What are the possible benefits and risks of participating?
The participants were able to try out a new exercise method over the course of the study's 2 weeks, which can be described as very time-efficient and not too strenuous. Besides the known risks associated with any physical activity, no additional risks were expected with this exercise method.

Where is the study run from?
University of Cologne (Germany)

When is the study starting and how long is it expected to run for?
May to September 2019

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Ms Jane Kersten, jane.kersten@uk-koeln.de

Contact information

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Additional identifiers

Protocol serial number
17-165

Study information

Scientific Title
Short-term whole-body electromyostimulation in cancer patients: a single-arm trial

Study objectives
Whole-body electromyostimulation (WB-EMS) could be an interesting and promising exercise technology for cancer patients, even for shorter periods such as the prehabilitation phase.

As an effective and beginner-friendly exercise method, WB-EMS could be considered in patients whose operation is imminent.

The primary aim of this study was to examine whether 2 weeks of WB-EMS exercise are feasible and effective in cancer patients during medical treatment.

As a secondary objective, the study aimed to examine whether short-term WB-EMS could already have a positive impact on body composition, physical performance, quality of life, anxiety and depression, fatigue syndrome, and perceived physical condition

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 05/03/2018, Medizinische Fakultät der Universität zu Köln (Kerpener Straße 62, Cologne, 50937, Germany; +49 (0)221-478-82900; ek-med@uni-koeln.de), ref: 17-165

Study design
Single-arm non-randomized trial

Primary study design
Interventional

Study type(s)
Prevention, Quality of life, Safety

Health condition(s) or problem(s) studied

Cancer patients, with diverse entities, disease stages, under acute therapy and after medical treatment

Interventions
The patients performed four WB-EMS exercise sessions in 2 weeks. The training duration was 15 minutes in the first week, increasing to 17 minutes in the second week. The training was performed with an EMS device from Miha-Bodytech (Augsburg, Germany). During the electrical impulse stimulation, patients performed active body-weight movements such as Squats. The recovery time between two sessions was at least 48 hours.

Intervention Type
Device

Phase
Not Applicable

Drug/device/biological/vaccine name(s)
EMS device from Miha-Bodytech (Augsburg, Germany)

Primary outcome(s)
Feasibility is measured using drop-out rate, training adherence and adverse events at the end of the intervention

Key secondary outcome(s))
1. Body composition measured using Bioelectrical Impedance Analysis (BIA) at baseline and post-test
2. Physical performance measured using modified step test according to the World Health Organization (WHO) scheme, the hypothetical one-repetition maximum and the handgrip method at baseline and post-test
3. Quality of life measured using the Quality-of-Life Questionnaire (EORTC-QLQ-C30) developed by the European Organisation for Research and Treatment of Cancer at baseline and post-test
4. Anxiety and depressive symptoms measured using the Anxiety and Depression Scale at baseline and post-test
5. Fatigue syndrome measured using the Multidimensional Fatigue Inventory at baseline and post-test
6. Perceived physical condition measured using the German WKV-Questionnaire before and after every WB-EMS exercise session

Completion date
11/09/2019

Eligibility

Key inclusion criteria
1. Diagnosed with a solid tumor
2. Receive concurrent medical therapy, including chemotherapy, radiation, immunotherapy or were cancer survivors, including receiving endocrine therapy

3. Over 18 years of age
4. Gave informed consent
5. Received medical clearance to exercise by a physician

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Total final enrolment
13

Key exclusion criteria
1. Acute severe cardiovascular or neurological diseases
2. Patients with electrical implants (s.a. pacemaker or defibrillation)
3. Osteosynthesis-related metal in the body or ongoing pregnancy
4. Patients with acute venous thrombosis
5. Major surgeries in stimulation areas (e.g. heart surgery, abdominal or pelvic surgeries, orthopedic surgeries, neurosurgical procedures) within the last 3 months

Date of first enrolment
01/06/2019

Date of final enrolment
01/09/2019

Locations

Countries of recruitment
Germany

Study participating centre
Center of Integrated Oncology Aachen Bonn Cologne Düsseldorf, University Hospital of Cologne
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Sponsor information

Organisation
University Hospital Cologne

ROR
https://ror.org/05mxhda18

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon request from Jane Kersten (jane.kersten@uk-koeln.de)

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		07/01/2025	10/01/2025	Yes	No