

Emma Rheel, PhD¹, Sophie Pleysier, MSc¹, Anneleen Malfliet, PhD^{1,2}, Tine Vervoort, PhD³, Kelly Ickmans, PhD^{1,2,4}

¹ Pain in Motion research group (PAIN), Department of Physiotherapy, Human Physiology and Anatomy, Faculty of Physical Education & Physiotherapy, Vrije Universiteit Brussel, Brussels, Belgium; ² Department of Physical Medicine and Physiotherapy, Universitair Ziekenhuis Brussel, Brussels, Belgium; ³ Department of Experimental-Clinical and Health Psychology, Ghent University, Ghent, Belgium; ⁴ Movement & Nutrition for Health & Performance research group (MOVE), Department of Movement and Sport Sciences, Faculty of Physical Education and Physiotherapy, Vrije Universiteit Brussel, Brussels, Belgium.

BACKGROUND & AIMS

Children with cancer frequently report pain across the disease trajectory starting from diagnosis and sometimes persisting into survivorship [1-3]. Additionally, many children with cancer experience changes in body composition during the cancer continuum [4,5].

Associations between pain and body composition have been found in adult cancer populations [6,7], yet have not been investigated in children with cancer.

Aims:

Therefore, the aim of this study was to gain insight into the differences in and associations between pain and body composition in children with cancer compared to healthy controls.



METHODS

Setting & Ethics

- Cross-sectional case-control study
- Approved by the Ethics Committee of the Vrije Universiteit Brussel/University Hospital Brussels and Ghent University/University Hospital Ghent
- Pre-registered at clinicaltrials.gov (NCT04004455)
- Children with cancer: Pediatric Hemato-Oncology and Stem Cell Transplantation department of the University Hospital Brussels and Ghent, Belgium
- Healthy controls: schools nearby participating Hospitals, and family/acquaintances of researcher team
- Recruitment and participation: July 2019 - May 2022



Participants

- 30 children with cancer; 30 healthy age- and sex-matched peers
- 8-18 years old
- 26 girls; 34 boys
- Exclusion criteria: 1) developmental disabilities, 2) mental impairment or psychiatric disorders, 3) significant vision or hearing impairment, 4) underlying primary chronic pain disorders, 5) cancer relapse (i.e., not first cancer diagnosis), and 6) child or parent unable to read/speak Dutch

Measures

- **Socio-demographics**
 - Sex and age (child-report), diagnosis, date of diagnosis, medication (parent-report and medical record)

METHODS

Measures

- **Pain variables**
 - Pain experiences past 2 weeks (yes/no, frequency, intensity, impact on daily activities)
 - Chronic pain (yes/no)
 - Pressure pain thresholds (PPTs): musculus tibialis anterior (MTA) and trapezius pars descendens (MTD)
- **Anthropometric variables**
 - Waist circumference (WC) (cm)
 - Body fat (%)
 - Fat mass (kg)
 - Fat free mass (kg)
 - Muscle mass (kg)
 - Body water (%)
 - Body Mass Index (BMI) (kg/m²)

RESULTS

Between-group differences

- Chronic pain children with cancer > healthy peers (p=.011)
- PPT MTA children with cancer < healthy peers (p=.030)
- Body water % children with cancer < healthy peers (p=.020)
- WC children with cancer > healthy peers (p=.012)
- Body fat % children with cancer > healthy peers (p=.029)
- No other sign. diff.

Associations

- Both children with cancer and healthy controls:
 - higher muscle mass ~ higher pain intensity (p=.049; p=.013)
- Children with cancer:
 - higher fat free mass ~ higher pain intensity (p=.013)
 - Higher muscle mass ~ higher PPT MTA (p=.013)
 - Higher fat free mass ~ higher PPT MTA (p=.013)
 - Higher WC ~ higher PPT MTD (p=.044)
 - Higher fat free mass ~ higher PPT MTD (p=.007)
 - Higher muscle mass ~ higher PPT MTD (p=.007)
- Healthy controls:
 - Higher WC reported ~ more pain locations (p=.029)

CONCLUSIONS

- A comprehensive pain testing protocol in future studies might provide a more complete insight in pain processing alterations in children with cancer.
- Somatosensory abnormalities as well as changes in body composition are prevalent in children with cancer during treatment.
- First proof for differential relationships between pain and body composition in children with cancer compared to healthy controls.



(paper in progress)

CONFLICT OF INTEREST

All authors disclose no conflict of interest.

CONTACT



emma.rheel@vub.be

www.paininmotion.be

REFERENCES

- [1] Lu Q, et al. Pain. 2011;
- [2] Van Cleve L, et al. Nurs Res. 2004;
- [3] Tutelman PR, et al. Clin J Pain. 2018;
- [4] Yang HR and Choi HS. Nutr Res Pract. 2019;
- [5] Chow EJ, et al. Cancer. 2007;
- [6] Leysen L, et al. Support Care Cancer. 2017;
- [7] Balderas-Peña LM, et al. Nutrients. 2020.