

PELVIC FLOOR MUSCLE ASSESSMENT IN PATIENTS WHO HAVE UNDERGONE GENERAL REHABILITATION FOLLOWING SURGERY FOR COLORECTAL CANCER: A PILOT STUDY

Hypothesis / aims of study

The effects of a multidisciplinary oncology rehabilitation program on pelvic floor outcomes (bladder, bowel, and sexual dysfunction) are currently understudied. Although various outcome measures exist to evaluate pelvic floor outcomes, including patient-reported outcome measures (severity of symptoms) and clinician reported outcome measures (muscle strength testing, anorectal pressure manometry and ultrasound), little is known about the relationship between patient-reported and clinical outcome measures for the pelvic floor in a colorectal cancer (CRC) population. The aims of this pilot study were (1) to explore the effect of a general oncology rehabilitation on the severity of pelvic floor symptoms and pelvic floor muscle (PFM) function in patients following surgery for CRC, (2) to investigate the correlation between different clinical outcome measures and (3) to assess the associations between clinical outcome measures of PFM function and severity of pelvic floor symptoms.

Study design, materials and methods

This pilot study is an exploratory analysis of the results of a multidisciplinary oncology rehabilitation program on pelvic floor outcomes in patients following surgery for stage I-III CRC. Ten participants were enrolled in this pilot study between July 2014 and August 2015, and all provided written informed consent before enrolment. The oncology rehabilitation program included an eight week, twice-weekly supervised, group-based exercise and education program conducted by a physiotherapist, exercise physiologist, psychologist and dietician. Pelvic floor signs and symptoms (Australian Pelvic Floor Questionnaire (APFQ), the International Consultation on Incontinence Questionnaire Bowel module (ICIQ-B) and bladder and bowel diaries), anorectal/PFM function (digital rectal examination, anorectal pressure manometry, and transperineal ultrasound) were measured before (T1) and immediately after the eight-week oncology rehabilitation program (T2) and at 6-month follow-up (T3). Repeated measures analysis of variance (ANOVA) was used to compare different assessment time-points. Relationships between the clinical outcome measures were evaluated using Spearman's rank correlation coefficient Rho; linear regression analyses were performed to examine the relationship between clinical outcome measures and patient reported outcome measures. All analyses were tested with a significance level of $p < 0.05$.

Results

Ten patients (7 males, mean age 70.0 ± 6.2 years) participated in the oncology rehabilitation program. Eight out of 10 participants (80%) had a diagnosis of colon cancer. All participants had undergone surgery for CRC (50% anterior resection and 50% hemicolectomy), and six participants had received adjuvant treatment (chemotherapy and radiotherapy) before and/or after surgery. Of the 10 participants, six had prior pelvic/pelvic floor surgical history.

Pelvic floor muscle maximum voluntary contraction values measured with anorectal pressure manometry increased immediately post-oncology rehabilitation and were sustained at 6-month follow-up, but the difference did not reach significance (T1 = 105.6 cmH₂O; T2 = 119.7 cmH₂O; T3 = 122.7 cmH₂O, $p = 0.06$). There were no significant changes of PFM function in ultrasound variables, although there was a trend toward increased levator hiatus anterior-posterior distance (sagittal plane) at maximum voluntary contraction (T1 = 4.5 cm; T2 = 5.0 cm; T3 = 5.3 cm, $p = 0.09$).

The APFQ bowel domain score improved from 2.3 ± 1.5 to 1.5 ± 0.8 immediately post-oncology rehabilitation, and to 1.9 ± 1.3 at 6-month follow-up ($p = 0.04$). Similarly, improvements noted in ICIQ-B bowel control domain following oncology rehabilitation were sustained at 6-month follow-up ($p = 0.03$). No significant changes were observed in relation to the objective measures of pelvic floor symptoms from bladder and bowel diaries except the average 24-hour voided volume, which increased significantly immediately post-oncology rehabilitation and was maintained at 6-month follow-up (T1 = 1671.2 ml; T2 = 1973.1 ml; T3 = 2158.9 ml, $p = 0.02$).

Statistically significant correlations for muscle strength were found only between maximum voluntary contraction measured by anorectal pressure manometry and muscle strength of the external anal sphincter (Spearman's rho 0.73, $p < 0.05$) as assessed at digital rectal examination immediately post-oncology rehabilitation program. Linear regression analysis showed that clinical outcome measures (anorectal pressure manometry and transperineal ultrasound) were not significantly associated with pelvic floor symptoms (APFQ and ICIQ-B) at any assessment time-point.

Interpretation of results

To our knowledge, this is the first study with a pilot of ten patients providing preliminary results to demonstrate the effects of a multidisciplinary oncology rehabilitation program on pelvic floor outcomes in patients following surgery for CRC. The findings showed no significant differences in clinical outcome measures following the rehabilitation program, but patient-reported bowel symptoms significantly improved immediately post-oncology rehabilitation and were maintained 6 months after the start of study. Maximum voluntary contraction measured with anorectal pressure manometry was the only variable correlated with digital muscle strength testing of the external anal sphincter. No associations were found between clinical outcome measures and patient-reported pelvic floor symptoms. The finding of this pilot study coincides with a study by Zutshi et al. [1], which showed that ultrasound findings had no correlation with manometry results and incontinence scores in patients following surgery for faecal incontinence.

Concluding message

From this exploratory analysis, a multidisciplinary oncology rehabilitation program appears to be effective for improving patient-reported bowel symptoms following surgery for CRC. Moreover, it seems that there is a strong positive correlation between digital rectal examination and anorectal pressure manometry following oncology rehabilitation. However, further studies with larger sample sizes are needed to establish the optimal outcome measure for pelvic floor outcomes in a CRC population. The results of this pilot study provide useful foundation for future studies to design a large randomized controlled trial to study the impact of general oncology rehabilitation or a PFM training program [2] on pelvic floor outcomes.

References

1. Zutshi M, Salcedo L, Hammel J, Hull T. Anal physiology testing in fecal incontinence: is it of any value? International Journal of Colorectal Disease 2010 Feb;25(2):277-82.
2. Lin KY, Granger CL, Denehy L, Frawley HC. Pelvic floor muscle training for bowel dysfunction following colorectal cancer surgery: A systematic review. Neurourology and Urodynamics. 2015 Nov;34(8):703-12.

Disclosures

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Clinical Trial: Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics Committee:** Cabrini Hospital Human Research Ethics Committee **Helsinki:** Yes **Informed Consent:** Yes