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Introduction
Colorectal cancer (CRC) is responsible for 8.5% of all cancer deaths yearly worldwide and is the second most common cancer in women and third most common in men. Surgery is usually the preferred treatment. Adjunct treatment includes radiotherapy and chemotherapy. All potential treatments may impact normal pelvic floor function. Fecal incontinence is a prevalent symptom after CRC surgery, negatively affecting QoL. Pelvic floor muscle training is a highly recommended treatment for non-cancer patients, but there is a gap in the literature that explores this treatment in the CRC population.

Aim/Primary Aim
To systematically investigate the effect of PFMT on bowel dysfunction in patients after surgery for CRC.

Study Design/Methods
Systematic review conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA).

Search strategy: Electronic databases search from 1806-March 2014 by one reviewer using different combinations of key terms for articles written in English.

Study selection: Inclusion criteria as follows:
Type of studies: Quantitative study designs including RCTs, cohort studies and case series published in peer reviewed journals.
Types of participants: Subjects of any age who had undergone surgery for and stage of colon or rectal cancer.

Type of intervention: Studies which included PFMT/"Kegel exercise"/anal sphincter exercise, with or without visual, sensory, or auditory biofeedback. This could include EMG or pressure feedback for strengthening and/or sensory training.

Types of outcomes: Included if primary outcome was bowel function measured by patient-reported outcome measures or anal manometry. Two reviewers independently assessed studies based on titles or abstracts for inclusion. Full texts of those chosen the reviewed to evaluate further for eligibility.

Statistics: Kappa statistics and percentage agreement calculated to establish agreement between reviewers using SPSS for Windows statistical software package. Values of kappa> 0.8 reflect “excellent” agreement.

Results
Study characteristics: Eight studies met inclusion criteria, six of which were prospective non-randomized studies, 2 retrospective studies. Table II outlines
characteristics of the 374 subjects included. Mean age 55.0 (11.3) to 67.0 (8.8) yrs, total male-211, female-134. 75% of the studies included participants who had undergone chemotherapy and/or radiotherapy.

**Intervention:** Table III outlines type, duration, and frequency of PFMT. Six of the studies used manometric training, one with EMG, all but one included home practice, and length of intervention ranged from 3 weeks to 20 months.

**Risk of Bias and Level of Evidence:** Table I. Risk of bias mean score 4.9 (ranged from 3-7) Level of evidence range from III-2 to IV.

**Outcomes:**
- Patient-reported outcome measures: Table IV. Of the 3 studies reporting on FI, 2 of the studies reported significantly reduced (P<0.05) using manometric pressure biofeedback. Four of the six reporting on bowel frequency significantly improved after intervention (P<0.05)
- Manometric measures: Only 1/6 studies that reported on anorectal manometry to assess physiological function demonstrated a significant improvement in mean resting pressure, maximal squeeze, and maximum tolerable volume.
- Health-related QoL: Only 3 studies assessed with 2 studies significant improvement in some domains and one significant improvement in total score after intervention.
- Questionnaires: 4/5 studies using questionnaires to assess severity of FI demonstrated significant improvement: 1/1-Modified Cleveland Incontinence Score (MCIS) and 3/4-Wexner Incontinence Scale (WIS)

**Discussion**

After systematic review of evidence for the effect of PFMT after CRC for cancer, determined PFMT may improve bowel function and quality of life post-operatively of colon and rectal cancer patients. All but one study included biofeedback with PFMT, therefore cannot make recommendation of PFMT alone. Although reduced stool frequency and improved quality of life most often noted, no changes to manometric measurements post-intervention except in one study. Findings from this systematic review of post-op cancer patients has similar findings as the 2012 Cochrane review *Biofeedback and/or sphincter exercises for the treatment of faecal incontinence in adults.*

Weakness of methodical design noted, and concluded “some elements of biofeedback therapy and sphincter exercise may have a therapeutic effect, but this is not certain.”

**Strengths & Weaknesses**

**Strengths**
- First systematic review to include all colorectal surgery for cancer.
- Reported males vs females

**Weaknesses**
- No RCT, small n, and use of retrospective studies.
- Review does not separate out surgery vs surgery plus radiation vs surgery plus chemotherapy, surgery vs radiation and chemotherapy.
- Only 2 studies included had long-term follow-up, and they had conflicting findings.
- PFMT programs all different regarding the components of training.
- Almost all with biofeedback

**Clinical Application/Discussion Questions:** Included in Visser summary

**Articles of interest:** Included in Visser summary