Constipation and defecation dynamics

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Acknowledgements

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Outline

• Constipation
  • Functional - Structural - Behavioural
• Differential diagnosis
• What physiotherapists can contribute
• The ins and outs of rectal balloon therapy
  *Disclaimer: The pun is unintentional
  *Further disclaimer: …Maybe the pun is intentional

• Bowels are evil and complex REALLY super fantastically interesting and them team work can be really rewarding!
What I WON’T be talking about

- In depth lifestyle changes
- Dietary contributors
- Pharmacy/medications
- The aging population
- Aperients
- Slow transit constipation
- Neurological/systemic/metabolic contributors
- Toilet position, bowel regimes, detailed defecation dynamics
- Internal therapies and informed consent
- Surgical or medical management (i.e. Botox)
- The importance of the multi-disciplinary team

Constipation is MASSIVE!!!!!!!!!!!
“Have you heard of the movie “Constipation”?"

“I can’t say I have”

“That’s because it hasn’t come out yet”

……. You’re welcome
How do we define constipation?

Rome 3 Criteria for functional constipation
(http://www.theromefoundation.org/assets/pdf/19_RomeIII_apA_885-898.pdf)

Fewer than 3 bowel movements per week
Straining ≥ 25% of the time
Lumpy or hard stools ≥ 25% of the time
Sensation of anorectal obstruction/”blocking” ≥ 25% of the time
Sensation of incomplete emptying ≥ 25% of the time
Manual maneuvering required to defecate ≥ 25% of the time
What else?

Other symptoms to watch for –

Abdominal bloating or discomfort
Pain on defecation – anal or abdominal
   Rectal bleeding
   Spurious diarrhea
   Low back pain
Feeling of incomplete emptying
   Digitating stool
   Tenesmus
Prevalence and other interesting stuff

• Global prevalence 11-18% (Suares & Ford, 2011)

• Many studies incorporate standard measures such as fibre intake adjustment, increasing fluids, increasing exercise +/- the use of aperients prior to biofeedback modalities (McCrea, Miaskowski, Stotts, Macera, & Varma, 2008)

• Push effort during defecation should be no more than 50-70% of maximum push effort (Rao & Patcharatrakul, 2016)
Structure and function

• Structural and functional issues can co-exist
• Proximal colonic activity - ? Volume and stool consistency
• Rectum acts as a reservoir for storage of stool
• During rectal filling
  • Requirement for rectal wall compliance
  • Autonomic neurons for sensation/perception of stool volume and consistency
  • Activation of rectoanal inhibitory reflex
  • Voluntary EAS contraction until able to reach toilet
• Intact IAS for continence

(McCrea, Miaskowski, Stotts, Macera, & Varma, 2008; Wald et al 2014)

Image adapted from https://medical-dictionary.thefreedictionary.com/Rectum
Defecation

- Reach level of critical fill
- Squat position – straighten anorectal angle
  - More obtuse to 15-20°
- Relaxation of EAS and puborectalis
- ↑ IAP coordinated with ↓ pelvic pressures
  - Allows stool to enter lower rectum
  - Mobile perineum to allow for descent
  - Spontaneous rectosigmoid contraction
    - Continuous until the rectum is perceived as empty

(Nikjooy et al., 2015; Bharucha, 2006)
Constipation - Behaviour
Constipation – behaviour and adaptation

- Maladaptive learning
  - Painful defecation in childhood
  - Painful defecation post surgically
  - Pelvic trauma or sexual abuse
  - Toilet aversion/social impact
  - Stress/anxiety
  - Dietary changes – elderly?

(Whitehead, di Lorenzo, Leroi, Porrett, & Rao, 2009; Leroi, Berkelmans, Denis, Hémond, & Devroede, 1995; McCrea, Miaskowski, Stotts, Macera, & Varma, 2008; Rao, Tuteja, Vellema, Kempf, & Stessman, 2004)
Differential diagnosis in constipation

Assessment modalities

- Digital rectal examination (DRE)
- Anorectal Manometry (ARM)
- Defecography
- EMG of the pelvic floor
- Balloon expulsion test (BET)
- Magnetic Resonance Imaging (MRI)

Structural and functional issues can co-exist

- Lack of adequate specificity of tests
  - Dx – No single test – combination required

(Wald, Bharucha, Cosman, & Whitehead, 2014)
Differential diagnosis

• DRE
  • Accessible
  • Sensation testing
  • Good NPV(91%)
  • Simulated defecation
    • ↓ Anal canal pressure
    • Palpate puborectalis
      – ? Widening of anorectal angle
  • Appropriate training?? Under utilized??

(Lawrentschuk and Bolton 2004; Wald, Bharucha, Cosman, & Whitehead, 2014)
Differential diagnosis

DRE and BET (Caetano, Santa-Cruz, & Rolanda, 2016)

- BET
  - Sensitivity 67% (Caetano, Danta-Cruz, & Rolanda, 2016)
  - Sensitivity 50% (Rao, 2008)
  - Specificity 80%
  - NPV 72%
  - Left lateral lie V’s seated (Ratuapli, Bharucha, Harvey, & Zinsmeister, 2013)

- DRE
  - Sensitivity 80%
  - Specificity 84%
  - NPV 64%

Neither suitable for screening when used in isolation
Differential diagnosis

ARM

• Contraction V’s relaxation
  • Canal pressures/rectal pressure activity
  • Rectal propulsive force
    • > 20% reduction in canal pressures

(Rao, 2008; Wald, Bharucha, Cosman, & Whitehead, 2014)
Differential diagnosis

Defecography (Rafiei et al., 2017)

- Barium injection and radiographic analysis
What is DD (Dyssynergic Defecation)?

- Reportedly present in 28%-33% of people presenting with constipation (Nyam et al 1996; Rao et al 2010)
- Inappropriate relaxation and coordination of the PFM complex at time of emptying
- Impaired push effort due to:
  - Inappropriate relaxation of the PFM complex
  - Poorly coordinated rectal, anal and abdominal muscles (Lee, Jung & Myung, 2013; Rao 2008)
- < 20% reduction in anal canal pressure during simulated defecation
- Inadequate expulsion at defecation
  - Consider balloon expulsion test (Bharucha, Wald, Enck, & Rao, 2006; Wald, Bharucha, Cosman, & Whitehead, 2014; McCrea, Miaskowski, Stotts, Macera, & Varma, 2008))
Anorectal angle – what we expect

(Nikjooy et al., 2015)
EMG patterns – what might we see with anal BFB EMG?  
(Lee, Jung, & Myung, 2013)
DD Profiling….

• Profiling (Rao et al., 2004)
DD – Social impact (Rao et al., 2004)

![Bar chart showing adverse effects in different life categories: Work life, Sexual life, Family life, Social life. The chart indicates a higher adverse effect in Social life compared to others.]
Physiotherapy

• Introduce role/Introduce the session
• Voluntary reporting – do we need to dig?
  • The importance of the subjective assessment and measures such as Bowel diary and Bristol stool chart
• Standard treatments for constipation will not impact dyssynergic defecation – *Psst…..Clinical hint!!!!*(Pourmomeny et al, 2011)
• Biofeedback interventions superior to aperients, diet, exercise and diazepam in DD *(Chiaroni et al., 2006; Heyman et al., 2007; Rao et al., 2010)*
“Standard treatment”

- Avoid constipating medications
- Stool softeners if required
- Increase fibre – 30g daily
- Increase fluids
- Increase general exercise
- Bowel regime
- Avoid manual manoeuvres such as digitating
Recommended pathway for DD

- Education
- Simulated defecation training (+ pelvic floor relaxation)
  - 15 minutes of diaphragmatic breathing 3 x daily
  - ? Positioning ? Appropriate context  (Nikjooy et al., 2015)
  - ? Individualised
  - +/- Internal therapy
- Practicing simulated defecation
  - Internal therapy i.e. Balloon expulsion, endo anal biofeedback

(Wald, Bharucha, Cosman, & Whitehead, 2014)
Rectal balloon therapy

Why

- Defecation training
  - Improving abdominal push effort
  - Ano-rectal coordination (EAS/levator ani coordination)
  - Functional training
- Coordination training for FI
  - EAS coordination
- Sensation testing and training
  - Internal sphincter de-sensitisation/improve sensory threshold
  - Impaired sensation
- Specificity
  - 80-90%
- Sensitivity 50%

(Rao, 2008; Chiarioni, Kim, Vantini, & Whitehead, 2014; Rao, Ozturk, & Laine, 2005)
Rectal Balloon Therapy

• Why again…. (Staring to sound like my 3 year old)
  • Inexpensive
  • Bedside/community level
  • Can identify patients with DD

• Validation and reproducibility
  • Found to be reliable for assessment of DD
  • High level of agreement with anorectal manometry and EMG
  • 2 minute upper limit for evacuation = 100% reproducible
  • 1 minutes upper limit = 98% reproducible

(Chiarioni, Kim, Vantini & Whitehead, 2014; Lee & Kim, 2014)
Rectal balloon therapy

What - Equipment

• Rectal balloon – Consider latex V’s latex free
• 60mls syringe
• 3 way Luer lock
• Lubrication
• Gloves
• Tissues
• Bluey
• ? Commode
Filling the balloon

To deflate balloon

Maintains balloon volume and allows drawing of air to syringe

Allows addition/subtraction of air
What does the process look like?
Getting to know the balloon
Rectal Balloon Therapy

How

• No standard methodology
• General -
  • Double glove – ?? Latex allergy
  • Patient in side lie – Knees/hips flexed
  • Insertion of deflated balloon – Lubricated++++
  • Insert to above anal verge
• Filling
  • 10mls increment filling with air or;
  • Fill with water (50mls) to mimic full rectum/sensation to defecate (Pourmomeny, Emami, Amooshahi & Adibi, 2010; Chiaroni, Kim, Vantini & Whitehead, 2014)

What are we looking for?

(Chiaroni, Kim, Vantini & Whitehead, 2014; Lee & Kim, 2014)
Rectal balloon therapy for DD

- Muscular coordination at 1st sensation
  - Diaphragmatic breathing/body scanning
  - Increased IAP/Increased rectal pressure/Reduced EAS pressure
  - X 10-15 reps
- Functional training
  - May wish to use enema 1-2 hours prior to session
    - Confidence and comfort
    - Although not necessary (Lee & Kim 2014)
  - 50mls air/water
  - Seated on commode
  - May increase if 1st sensation not yet met
    - ??? Ability to expel (Rao, 2007)
  - Aim for expulsion within 1-2 minutes
  - Repeat
  - Typically 4-6 sessions – reinforce at 3, 6 and 12 months (Lee, Jung, & Myung, 2013)
The literature - Consensus....

- Standard constipation measures are important
- Differential diagnosis is important
- High heterogeneity in methodology
- An adjunct to usual therapy
- BFB/Internal therapies are labour intensive
  - One study demonstrated BFB to be superior to balloon therapy
- Importance of multi-disciplinary team - ?? Feasibility
- Minimal studies around home based training
Biopsychosocial

- Bio – Check ✓
- Psychosocial
  - Psychological stressors may exacerbate symptoms (Rao et al., 2004)
  - BFB therapy can assist with improving quality of life in patients with DD
  - Correlation between constipation severity and mental and physical health QOL outcomes (Albiani, Hart et al. 2013)
  - ↑ Prevalence of OCD, anxiety, depression, psychotocism and somatization (Rao et al., 2007)
  - Successful therapy goals = ↑ QOL and ↑ patients satisfaction (Lewicky-Gaupp, Morgan, Chey, Muellerleile, & Fenner, 2008)

Goals must be REALISTIC, FLEXIBLE, NEGOTIABLE!!!!
Conclusions

• Constipation requires a MDT approach
• Differential diagnosis is important
• Psychological impact across all domains
• Biofeedback techniques are accessible and inexpensive
  • HOWEVER – more research needed
  • Adjuncts only
• Rectal balloon therapy/BET can be a very useful and reliable way to assess and manage DD – Practice!
• Goal setting – Talk to your patients and reassure!
References


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