Acute GI effects of radiotherapy

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Learning Objectives

Acute Radiotherapy Effects

To learn about

- Presentations of GI toxicity
- Consequences of GI toxicity
- Treatment of GI toxicity
- Prevention of GI toxicity
Clinical Case
MJ aged 48

- Stage 3B adenoCa cervix
- Pelvic radiotherapy with IMRT
- Concomitant cisplatin and infusional 5FU
Clinical course

- Initial mild constipation
  - Analgesia induced
- Nausea during week 1
- Mild diarrhoea week 3
- More diarrhoea week 4
- Severe diarrhoea week 5, urinary frequency, anal pain
Presentation and Treatment
Radiotherapy Induced Nausea and Vomiting

- Pathophysiology unknown
- Rates with standard RT alone 28-39%
- Risk depends on
  - Location
  - Size of field
  - Dose
  - Type of RT
  - Patient factors F>M
<table>
<thead>
<tr>
<th>Emetogenic Potential</th>
<th>Risk of emesis w/o antiemetic prophylaxis</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>High</td>
<td>&gt;90%</td>
<td>Total-body irradiation (TBI), total nodal irradiation (TNI)</td>
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<tr>
<td>Moderate</td>
<td>60-90%</td>
<td>Upper abdominal irradiation, hemibody irradiation (HBI), upper body irradiation (UBI)</td>
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<tr>
<td>Low</td>
<td>30-60%</td>
<td>Cranium, craniospinal, head and neck, lower thorax, pelvis</td>
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<tr>
<td>Minimal</td>
<td>&lt;30%</td>
<td>Breast and extremities</td>
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Treatment of RINV

- 5 HT3 receptor antagonists appear to be preferred agent
- Possibly combined with steroids if high risk
- Prophylaxis appears better than rescue
- Benefit highest in first week of RT
- NK-1 receptor inhibitors not widely studied but appear to be safe
Upper GI Effects

- Care on Treatment
  - Nutrition
    - regular dietician review
  - NG/PEG feeding
  - Dental hygiene
  - Skin nurse assessment
  - Speech and Language review
  - Physician review
RT associated diarrhoea

- 17,000 patients pa in UK undergo pelvic RT
- Up to 80% develop GI symptoms
  - Increased frequency
  - Urgency
  - Change in stool consistency
  - Pain
  - Bloating
Management

- No recognised guidelines
- Grade 1
  - Hydration, consider low irritant fibre diet, stool bulking
  - Prn loperamide
- Grade 2
  - Regular loperamide
- Grade 3
  - Consider admission
  - Consider opiates, octreotide
  - Stool cultures
- Grade 4
  - Admission, IV fluids
Consequences
Late Radiation Gastrointestinal Toxicity

- Incidence of late toxicity is correlated with acute toxicity
- One million people in UK have survived abdominal or pelvic cancer
- 90,000 suffer from pelvic radiation disease
- 50% of these suffer symptoms sufficient to inhibit daily living
Prevention
Lifestyle Modification

- Retrospective studies show increased GI symptoms in
  - Smokers
  - High BMI
  - Physically inactive
Diet

- Probiotics
  - Meta-analysis of 6 trials
  - Decreases acute diarrhoea
  - Doesn’t appear to affect stool consistency/need for loperamide

- Fibre
  - Traditionally low fibre diet advised-no evidence for this-may worsen toxicity
  - Early results of Fibre study show high fibre may be beneficial

- Elemental diet
  - May decrease diarrhoea but unpalatable and don’t result in weight improvement
Bladder Filling Protocol

We suggest:
- Empty bladder and begin drinking

放射治疗

1 hour

Stay reasonably comfortable for 30-60 minutes more

1 1/2 - 2 hours total time
A comfortably full bladder

Too full - you will be uncomfortable and you may not be able to stay still, the treatment could be less accurate.

About half full - just right! You will be comfortable and most of your bladder will not be treated.

Too empty - too much bladder is treated.

Prostate

Treatment area
Effects of empty bladder

Small amount of bowel irradiated

Larger bowel volumes irradiated
Prevention

- Theory-more conformal radiotherapy will automatically lower side effects and allow for dose escalation
Dose distribution comparison: intact cervix

3D-CRT

RapidArc
Dose distribution comparison: post-op case

3D-CRT

RapidArc
Pharmacological prevention

- Amifostine
  - Free radical scavenger
  - Reduces acute GI toxicity in 7 RCTs
  - Only 2 showed decreased late toxicity

- Statins
  - One prospective study showed decreased acute toxicity

- Anti-inflammatory
  - 5 RCTs-3 had increased toxicity-closed early
  - 2 had reduced diarrhoea

- Orgotein
  - Antioxidant superoxide dismutase
  - 3 RCTs show reduced acute GI toxicity
Don’t appear to be useful

- Sucralfate enemas
- Butyrate enemas
- Misoprostol
- Octreotide
  - No benefit in prevention
  - Can be used in treatment
- Glutamine
Clinical Case
Clinical course

- Initial mild constipation
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Initial Management

Prior to RT

- Healthy balanced diet-no fibre modification
  - Treat constipation gently
  - Continue usual laxatives but prepare to tail off
  - Consider bulk forming laxative
- Good skin care esp in perineum
- Encourage good hydration
- Category 1 patient-the RT must continue!
Nausea

- 1\textsuperscript{st} line with chemo
  - Ondansetron, dexamethasone domperidone

- 2\textsuperscript{nd} line with chemo
  - Add apprepitant

- Consider RINV
  - Ondansetron 8mg \( \frac{1}{2} \) hr before RT daily
Diarrhoea

- **Initial**
  - Move from normal diet to high fibre, low irritant

- **Later**
  - Add loperamide prn

- **More severe**
  - Regular loperamide
  - Consider codeine

- **Severe**
  - Consider admission
  - Stop 5FU
  - Ensure bladder filling and hydration
  - Treat anal pain—proctocedyl, predfoam
Conclusions

- Prevention is best approach
- Early treatment is essential
- Admit if symptoms not controlled at home
- More PROMS data needed to see effects of changing treatment modalities such as IMRT