Two Novel Treatments for the Prevention and Treatment of Radiation Induced Moist Desquamation

Authors: Claire Bode, Helen Woodman, Radiotherapy Department, Queen Elizabeth Hospital, Birmingham, B15 2TH
1 – Training and education facilitator, 2 – Macmillan Paediatric Liaison Radiographer

Introduction

- A skin care working party was set up to produce evidence based practice skin care guidelines, including recommendations for the treatment and prevention of moist desquamation. Of 259 patients in 2008 revealed that 7% of patients developed moist desquamation.
- A literature search by members of the skin care working party found several studies looking at the prevention of skin reactions.

Methods and Materials

- 40 patients were identified at high risk of developing friction related moist desquamation (RTDG score 2b and above) using the results gained from the previous audit (see table 1).
- Of these 40 patients, 11 were given PolyMem to use during their treatment. The application started twice weekly. Once RTDG 2b was reached, the applications were increased to every other day. Their RTDG score was initially recorded weekly, then increased to twice weekly once 2c was reached. Each patient was issued with a 28ml spray bottle and given verbal instructions for use.
- 20 patients developed RTDG 2b were given PolyMem dressings applied at the patients discretion and their RTDG score recorded twice weekly. Their pain score was recorded before and after application using the following adapted pain management scale by McCaffrey and Bovee (1986) as supplied by Actisheal Health Ltd.

Results - CNSBF

- Of the 40 patients identified as being at high risk, 17 (42.5%) patients developed stage 2b or greater skin reactions, 3 of these later developed stage 3 and none of the patients in the study developed stage 4 (Graph 1).
- Stage 2b was not observed in any of the cases until week 3. Table 2 shows a summary of the weekly skin reactions observed in different patient groups including risk factors associated with these reactions. 8 of these patients went from 0 to 2b in the space of a week, 3 from 1 to 2b and 2 from 2a to 2b.
- The Radiographers observed a marked improvement in the skin reactions generally and in particular for patients treated for anal carcinoma that used CNSBF where the 2b area tended to be limited to the perineal region. In two anal carcinoma patients their groin and perineal areas were missed in the application process, stage 2b was reached at week 3 in these areas, compared to week 5 for the perineum.
- Some skin reactions did not follow the usual gradual progression through stages 1, 2a, 2b, and instead went straight to 2a or 2b.

Graph 1: RTDG skin reaction scores in 40 high risk patients using CNSBF

We are unable to offer an explanation as to why the skin reactions appeared to miss stages of reactions.
- Initially patients were asked to apply the CNSBF themselves, however Radiographers noted a better coverage and consequently a better reaction if the CNSBF was applied by Radiographers, this also encouraged Radiographers to assess the skin reaction more frequently and intervene earlier with PolyMem.
- The application process takes 30 seconds and due to the small size of patients requiring application, this has no overall impact on treatment unit throughput.
- In 2B patients there was a build up of CNSBF when the patient was unable to adequately wash the treatment area although this did not appear to effect the overall results. One breast patient stopped using CNSBF as her perfuse sweating caused a build up of fluid beneath the film causing discomfort.

Table 1: Patient groups identified as being at high risk of developing RTDG 2b skin reactions

<table>
<thead>
<tr>
<th>Treatment site</th>
<th>African-american</th>
<th>Latina</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groin</td>
<td>5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Breast</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Scrotum</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Vulva</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Anal</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

PolyMem

- Of the 17 patients reaching stage 2b+ in the CNSBF audit, 11 were given PolyMem to use (one patient was non compliant and a second patient had a dressing area that did not use it). The remaining patients were given gentian violet to apply by the clinician before PolyMem was used.
- A total of 20 patients were given the dressing. Table 3 shows at which RTDG stage PolyMem dressings were instigated and to which sites.
- PolyMem was generally used after the patient had received a minimum of 20Gy.

Table 2: RTDG weekly score

<table>
<thead>
<tr>
<th>Week Number</th>
<th>RTDG Score</th>
<th>Diagnosis</th>
<th>Risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2b</td>
<td>3 x Breast</td>
<td>As above (pro)</td>
</tr>
<tr>
<td>4</td>
<td>2b</td>
<td>2 x Anus</td>
<td>As above (pro)</td>
</tr>
<tr>
<td>5</td>
<td>2b</td>
<td>1 x Rectum</td>
<td>As above (pro)</td>
</tr>
<tr>
<td>6</td>
<td>2b</td>
<td>1 x Value</td>
<td>As above (pro)</td>
</tr>
<tr>
<td>7</td>
<td>2b</td>
<td>1 x Grains</td>
<td>As above (pro)</td>
</tr>
</tbody>
</table>

Table 3: RTDG score and number of patients issued with PolyMem dressing

<table>
<thead>
<tr>
<th>RTDG Score</th>
<th>No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Discussion

- From the results of the study there appears to be a delay in the presentation of acute skin reactions. This is highlighted in two anal carcinoma patients where stage 2b was reached at week 2 and week 3 respectively. By comparing the CNSBF application 2 weeks before the areas that had CNSBF applied.
- 52.5% of high risk patients did not reach the expected 2b skin reactions negating the need for further interventions, overall this may reduce the cost in treating these patients skin reactions long term as well as improving overall cosmetic results and the patients experience of treatment.

PolyMem

- There is a significant pain reduction for many patients. This is due to an inhibition by the polymeric membrane of the dressing on the receptor group, which has been shown to reduce inflammation, bruising and oedema10 on both broken and intact skin.
- The wound cleansing properties of the dressing ensured that the risk of infection was reduced while the dressing was in place as well as ensuring ease of dressing changes and the time required was minimised.
- Wound healing commenced in some patients even whilst continuing with radiotherapy treatment.
- PolyMem also acted as an anti-inflammatory when it was instigated at stage 2a, particularly in the anal-rectal region.
- Feedback from patients was positive, from ease of use to pain and oedema relief properties. No patients showed signs of sensitivity.
- Some areas still remain difficult to dress and ensure the dressing is secure e.g. scrotal, vulval regions. Often this was effectively managed by encouraging patients to use socotra supports and nettoilant pants.

Cost implications

- (as per October 2005 NHS supplies catalogue prices)
- 1 bottle of spray (£8.26) lasted for 4 weeks of application (18 patients). 22 patients required another bottle.
- Of these 40 patients, 11 received PolyMem dressings. Two sizes were ordered (10/15cm roll (£12.21 per roll) and 12x3 cm dressings (£4.21 per dressing), both dressings were cut to size as required and changed daily. Total cost per patient was dependent on when the dressing was issued the maximum cost for a single patient was £5 rolls (£5.05). As the dressing is freely available in the community GPs were able to prescribe the dressing for the patients once its effectiveness was established with only 1 dressing needing to be issued by the department.

Conclusion

- Due to the effectiveness of the CNSBF it is now routinely applied by Radiographers to pre-identified high risk patients, however all patients are tested for sensitivity prior to its application.
- CNSBF is also used to preserve skin marks required for superficial x-ray and electron treatments.
- PolyMem is now issued by Radiographers to all patients presenting with 2b skin reactions.
- In patients being treated for lower rectal / anal cancers the authors would recommend the instigation of PolyMem at 2a skin reactions, particularly when the patient has a heavy mucus discharge and therefore the skin is likely to macerate and breakdown.
- Future studies are warranted in the use of CNSBF where patients are asked to use their own control to fully establish CNSBF its effectiveness in the prevention of acute radiotoxicity induced moist desquamation.

References

5. European Society for Medical Oncology, Management of Acute Radiation Skin Stratification, London: University of Nottingham, 2006.