Insufficiency fractures in postmenopausal gynaecological patients receiving pelvic radiotherapy treatment – can we prevent them by optimising bone health?

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Aims

To reduce the incidence of pelvic insufficiency fractures in women who have undergone gynaecological radiotherapy by producing a tool to help clinicians optimise bone health.

Methods

We conducted a literature review of insufficiency fractures, the relationship of these with radiotherapy and treatment of osteoporosis. We initially used the FRAX score and National Osteoporosis Guideline Group guidance to calculate the fracture risk and indications for treatment. We have modified our practice to follow the guidance issued by Hadji *et al* (2017), who have published a position paper on the management of aromatase inhibition-associated bone loss.[1]

Results

Current data to support prevention of radiation-induced insufficiency fractures (IF) is limited. Pelvic IF secondary to radiotherapy treatment in gynaecological cancer patients are observed in up to 45% of patients; with a median time to development of 6–20 months. In 43–77% of patients these can cause significant pain and reduce quality of life. We hypothesise that in addition to the use of sophisticated radiotherapy techniques to reduce the exposure of bone to radiation (both volume and dose reduction – Ramlov *et al* (2017)),[2] addressing bone health will lead to a further reduction in the incidence of IF. Most patients are postmenopausal at the time of radiotherapy; we assess their bone health based upon dual energy X-ray absorptiometry (DXA) result and clinical risk factors. We also address their calcium and vitamin D status. Bisphosphonate therapy and appropriate calcium and vitamin D supplementation is considered if:

- T score <-2 irrespective of other risk factors
- T score of -1.5 to -2 plus one additional risk factor (see table)

A dental assessment is recommended in all patients prior to commencing a bisphosphonate. If oral therapy is not tolerated we would consider intravenous bisphosphonates or denosumab. We repeat the DXA scan at 2 years aiming to give a total 3–5 years of treatment.

1. Age >65 years
2. Low BMI (<20 kg/m^2)
3. Family history of hip fracture
4. Personal history of fragility fracture (particularly if after age 50 years)
5. Oral corticosteroid use for >6 months
6. Smoking history

Conclusion

We hope to reduce the incidence of insufficiency fractures by the combination of reduction in the volume and dose of radiation to the pelvis/other bones with intensity modulated external beam radiotherapy techniques and by optimisation of patient bone health. Further research is needed to improve quality of life in cancer survivors. ■

Conflict of interest statement

DY has received educational support from Amgen.

References

1 Haxdji P, Aapro MS, Body JJ *et al*. Management of aromatase inhibitor-associated bone loss (AIBL) in postmenopausal women with hormone sensitive breast cancer: Joint position statement of the IOF, CABS, ECTS, IEG, ESCEO IMS, and SIOG. *J Bone Oncol* 2017;7:1–12.

2 Ramlov A, Pedersen EM, Røhl L *et al*. Risk factors for pelvic insufficiency fractures in locally advanced cervical cancer following intensity modulated radiation therapy. *Int J Radiat Oncol Biiol Phys* 2017:97:1032–9.

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