Abstract

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Potential drug interactions and potentially inappropriate medications in daily radiooncology practice – a risk assessment

Background: Radiation treatment of malignant disease includes patients with various extents of tumor and different comorbidities. Due to bad general condition approximately 20% of irradiated subjects are in-patients. Beyond elimination of tumor and treatment of its side effects drug interactions and potentially inappropriate medications constitute a major challenge in these radiooncologic patients. The layering of polypharmacy with age and radiation related physiological and functional changes and comorbidities might increase the risk for potential drug drug interactions (pDDIs). This study attempted to quantify the frequency of pDDIs and potential inappropriate medications (PIMs) not related to i.v. chemotherapy in patients undergoing radiation treatment aiming the assessment of risk by medication.

Methods: Medication profiles were analyzed by reviewing discharge letters of 120 cancer patients who had been admitted to the Marienhospital, Herne between November 2010 and November 2011. An improvement of the Karnofsky index during hospital treatment had been registered. The medication of all patients (n = 120) was screened for pDDIs at hospital admission and at discharge using the ABDA drug interaction software (Pharmatechnik®). Potential interactions, graded by their levels of severity were identified. The patient’s medication profile was evaluated additionally in terms of potentially inappropriate medications due to an unacceptable risk-to-benefit ratio. Potential inappropriate medications in cancer patients were identified using the Priscus list (PIMs) and the Cave module (Individual inappropriate medications (IIMs). Logistic regression was applied to determine odds ratios for specific risk factors of pDDIs and potentially inappropriate medications i.e. age, gender and number of medications.

Results: The evaluation of the admission and discharge medication revealed that there was a significant risk for being harmed by potential drug interactions although the Karnofsky index improved after radiooncologic treatment (Mean admission: 67.9; Mean discharge: 75.4). At hospital discharge significantly more pDDIs per patient (2.25) were detected than at hospital admission (1.59) (p = 0.001). Most potential drug interactions (46.7%) involved non-anticancer agents such as antihypertensive drugs, corticosteroids, anticoagulants and NSAIDs. According to the Frechen-Score the most frequently involved drugs in therapeutically relevant pDDIs were cardiovascular drugs, insulin, corticosteroids and NSAIDs, whereas antipsychotics, antidepressants and antiemetics were rarely involved in potential drug interactions. In multivariate analysis, increased risk of receiving drug combinations in which there were potential drug interactions was associated with receipt of increasing numbers of drugs (p = 0.001). According to the Cave module 362 prescribed IIMs were inappropriate due to increased age (39%), and underlying metabolic (25%) or cardiovascular diseases (13.2%). With increasing age (p = 0.003), number of comorbid diseases (p = 0.005) and the number of medications (p < 0.001) the proportion of patients receiving IIMs increased. The three most common IIMs were antihypertensives (18.3%), NSAIDs (11.3%), and corticosteroids (10.3%). Of 79 patients aged > 65 46.8% were taking at least one PIM, as defined by the german Priscus list at hospital discharge.

Discussion: Although, there was an improvement of general performance status after hospital treatment the present study recorded a high prevalence of pDDIs and PIMs in the radiooncologic setting. Additional medication, including supportive therapies and concomitant medications should be weighed carefully for benefit versus risk of ADEs in the context of existing regimens prior to start of radiation. In the context of risk management recommendation guidelines for day-to-day routine were developed for radiooncologic patients. The risk by medications should be assessed periodically to reduce the overall risk potential.