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Mine Genc · Gamze Melek Aksu · Aylin Fidan Korcum · Melek Nur Yavuz
Medical Faculty, Akdeniz University, Antalya, Turkey

Commentary on "Late bone and soft tissue sequelae of childhood radiotherapy"

Original publication

Dörr W, Kallfels S, Hermann T (2013) Late bone and soft tissue sequelae of childhood radiotherapy. Strahlenter Onkol 189:529–534

We read the article entitled "Late bone and soft tissue sequele of childhood radiotherapy" by Dörr et al. [1] with great interest. There are few studies in recent years regarding this issue. They included 146 children with diagnosis of Hodgkin and nonhodgkin lymphoma, nephroblastoma, bone and soft tissue sarcoma, neuroblastoma and other tumors treated with external beam radiotherapy between 1970 and 1997. The authors reported the incidence of treatment-related changes in growing tissues. The mean planning target dose was reported to be 35.8 Gy (range 10.0–71.8 Gy) with a mean dose per fraction of 1.7 Gy (range 1.0–4.0 Gy). They described the effect of the dose and age at exposure on osseous hypoplasia, soft tissue defects and asymmetry, and they defined the relation between dose gradients within the vertebral body and kyphoscoliotic changes. The authors reported that the dose had been converted into the equivalent dose administered at 2 Gy per fraction, with an alpha/beta value of 3 Gy. Fractionation sensitivity of growing bone has not been clearly described in the literature. Hyperfractionation has been shown to reduce growth arrest induced by radiation experimentally. Eifel et al. [2] using weanling rat model suggested an alpha/beta ratio of 4.5 reflecting intermediate fractionation sensitivity but concluded that the rat model may not be an ideal model for estimating fractionation sensitivity of humans. Moreover Dörr et al. [3] reported the alpha/beta ratio of growing bone as 6 in the chapter "Pathogenesis of normal-tissue effects" in the book entitled *Basic Clinical Radiobiology*. In a recent study which compares hyperfractionation and conventional radiotherapy in standard risk medulloblastoma patients, cognitive functions and growth were evaluated [4]. The authors mentioned that alpha/beta ratio of 2 Gy was used for cognitive functions but it is not clear which value was taken for growing bone. In this aspect we are a bit confused because different values of alpha/beta values may reflect different fractionation sensitivities and we wonder why the authors in this study considered alpha/beta value of 3 Gy when evaluating late effects of growing bone.

Corresponding address

Prof. M. Genc
Medical Faculty
Akdeniz University, Antalya
minegenc@gmail.com

Compliance with ethical guidelines

Conflict of interest. M. Genc, G. M. Aksu, A. F. Korcum, and M. N. Yavuz state that there are no conflicts of interest.

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