Letter to the Editor

In regard to: Letter to the Editor “The impact of early life exposure to diagnostic and therapeutic radiation on childhood cancer risk”. Phys Med 2013 29, 221–223

We read with great interest the recent letter submitted by Ju et al. on the impact of early life radiation on childhood cancer risk [1]. This important subject merits more attention and we applaud the authors for their efforts. However, we would like to point out an important aspect that did not receive sufficient attention in that letter: the impact of radiotherapy technique on potential future secondary cancers.

Intensity modulated radiotherapy (IMRT) delivers a more conformal dose to the planning treatment volume (PTV) compared to conventional conformal (3D-CRT). In addition, IMRT has many other advantages over 3D-CRT, primarily with regard to target dose conformity and sparing of adjacent OARs. However, the complexity of IMRT requires more beams, and this may lead to higher doses delivered to out-of-field regions [2–4]. The measurements of out-of-field doses and the dose verification for IMRT itself present several problems and require complex approach [5,6]. Kry et al. analysed this risk by performing Monte Carlo calculations and found that, theoretically, the risk of fatal secondary malignancies is higher with IMRT than with conventional radiotherapy [7]. Although no clinical evidence has yet been found to support this theoretical conclusion, the assumption that higher out-of-field doses may increase the risk of secondary cancers is generally accepted as correct.

Our group recently compared 3D-CRT to IMRT in head and neck cancer to investigate this theoretical notion [8]. Although both techniques were similar in terms of the doses delivered to critical regions, IMRT resulted in significantly higher doses to the cerebellum.

As 3D-CRT gives way to IMRT, it becomes ever more vital that we resolve these questions. At present, it is still unclear whether higher doses to distant locations will have clinical side effects and/or increase the risk of secondary cancers [9–14]. However, considering that new technologies are rapidly replacing older radiotherapy techniques, we believe that it is essential that long-term studies with large patient cohorts be carried out to better understand the effects of IMRT on distant tissues.

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