LETTERS TO THE EDITOR

Response

From
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We thank Dr Milne for his thoughtful comments about our recent article (1). The diagnostic utility of small vessel measurements obtained with CT has been demonstrated previously. For example, the ratio between the diameters of the segmental artery and lobar bronchus in patients with pulmonary hypertension (PH) and chronic thromboembolic disease was found to be elevated in 50% of patients compared with 7% of healthy control subjects (2). In another study on patients with various parenchymal lung diseases, analysis of a combination of main pulmonary artery diameter and the segmental artery-to-bronchus ratio afforded a sensitivity of 86% in terms of detecting PH (3). This sensitivity is remarkably similar to that in our study, in which only pulmonary artery diameter was considered. It is important to note that, in patients with lung fibrosis, traction bronchiectasis (which is common) will likely confound small vessel measurements (4). Further, the clinical significance of tortuous peripheral arteries, which reflect plexogenic arteriopathy and are occasionally detected with CT, is difficult to interpret when pulmonary fibrosis is present. Thus, we believe that neither measuring small vessels nor searching for tortuous peripheral arteries substantially improves sensitivity or specificity of PH detection in the context of fibrotic lung disease.

In his correspondence, Dr Milne correctly describes the roles played by hypoxia-driven vasoconstriction, and structural changes in the small muscular arteries and arterioles, in the genesis of secondary PH. However, as pointed out in our study, exercise-induced hypoxemia caused blood viscosity to rise, and the consequent increase in shear stress affords a potential explanation for progressive dilatation of the pulmonary artery. Such dilatation was thus independent of pulmonary hemodynamic changes noted in the study by Boerrigter et al (5).

PH is prognostically important in patients with ILD. However, the fact that only weak-to-moderate correlation was found between $Sp_{O_2}$ and mean PAP in both our study and the work of others (6) indicates that pulse oximetry cannot be reliably used to screen for PH. Thus, right heart catheterization remains the gold standard for PH diagnosis. Improved noninvasive methods for accurately detecting PH are required.

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References


The Older, the Better

From
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Editor:
“If you don’t have long to live you don’t need to worry about the effects of radiation exposure.” This seems to be the message in the recent article by Brenner and colleagues (1) in the October 2011 issue of Radiology. This would appear to be self-evident and hardly require extensive research to confirm it, but in fact it is apparently not. During a recent session on “Practical Recommendations for Patients Undergoing Chest CT” (2), my colleagues and I made the observation that in more than 100 articles recently reviewed by us on the topic of reducing radiation dose, not one mentioned including the patient’s age when consider-

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We thank Dr Milne for his interesting comments. In fact, the traditional view that radiation-induced cancer risks decrease monotonically with increasing age at exposure (1) has been increasingly challenged in recent years (2–4). This is primarily because one of the main pathways to radiation-induced cancer is now thought to be promotion of preexisting premalignant cells by radiation to a malignant state, and our burden of such premalignant cells increases with age.

Most radiation-induced cancers appear in the “cancer-prone” ages (typically 50–80 years of age), independent of age at exposure (5), so the latency period between radiation exposure and the potential appearance of a cancer decreases markedly with increasing age at exposure. Taking these effects into account, more recent analyses of cancer incidence among atomic bomb survivors suggest that the lifetime risk of radiation-induced cancer is not so different, for example, for exposure at age 5 years versus exposure at age 55 years (3,6). Thus, it is not necessarily the case that “the older the better,” as Dr Milne asserts.

In summary, we agree that individual demographics such as age, and also potentially reduced patient expectancy on potential cancer risks from radiologic imaging. Radiology 2011;261(1):193–198.


Response

From

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References


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ing the risk of performing thoracic computed tomography (CT). The simplest way to reduce risk is not to perform thoracic CT in younger female patients, viz, those who are still menstruating.

In male and older female patients, say (with apologies) those aged 50 years, the risk of breast cancer induction from thoracic CT is so low that the benefit greatly exceeds the cost. In considering radiation risk, therefore, it is essential to look separately at young versus old, at male versus female patients, and, in particular, at pediatric patients.

These groups have widely differing risks and should not be mixed. For example, as Brenner et al have previously pointed out (3), the cancer induction risk of carrying out CT of the chest in a 15-year-old girl is high, whereas that in a 70-year-old man is very low.

One hopes that the authors’ continued reinforcement of the differing risks at different ages will lead to their widespread use as a simple and logical way of reducing radiation dose: specifically to those with the highest risk.

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In summary, we agree that individual demographics such as age, and also potentially reduced patient life expectancy (the topic of the article [7] on which Dr Milne comments), should be considered in assessing individual radiation risks. However, radiation-induced cancer risks probably vary less with age at exposure than had previously been thought, which is of particular importance for those patients who are most likely to undergo CT—that is, patients aged 45–65 years (8).

We reiterate that when CT is clinically justified, the comparatively small radiation risk will almost always be outweighed by the potential clinical benefit (9). It is nevertheless prudent to minimize the potential risks from any radiologic exposure, and the considerations briefly described herein suggest that it may not be wise to focus potential risk reduction strategies predominantly on pediatric patients, as Dr Milne suggests. Patients of all ages are important here, including older patients.

References


