Radiation risk of screening with low dose CT

I read with interest the article by MacRedmond et al. on screening for lung cancer using low dose CT scanning and the related editorial by Gleeson which provides a comprehensive summary of the benefits and potential pitfalls of such a screening. However, I noticed that, in both articles, the issue of the potential radiation risks associated with low dose CT screening for lung cancer has not been addressed.

Previously published reports have suggested radiation risks even with a low dose CT scan as part of a regular screening programme and also of a possible synergistic interaction between the risk from smoking and radiation exposure. Brenner estimates that, if 50% of all current and former smokers in the US population aged 50–75 years received annual CT screening, the estimated number of lung cancers associated with radiation from screening would be 1.8% (95% credibility interval 0.5% to 5.5%) more than the otherwise expected number. Considering an upper limit of a 5.5% increase than the otherwise expected number.

References


Effect of dichotomising age in multivariate model analysis

We read with interest the paper by Soler-Cataluña et al. which examined—in an impressive prospective study with 5 years follow up—the factors predicting poor prognosis and mortality in patients with severe acute exacerbations of chronic obstructive pulmonary disease (AECOPD). Their findings are complementary with the current available literature in that older age, arterial carbon dioxide tension, and acute exacerbations were independent predictors of mortality in their cohort.

We have concerns, however, regarding both their analyses and conclusions. Firstly, several studies have given advice on the limitations of dichotomising continuous predictors as they come at a cost “as explanatory variables could be seriously misleading, both in respect of which variables are significant in the model, and perhaps also with respect to the overall predictive ability.” Soler-Cataluña and colleagues state that in their multivariate model “the frequency of acute exacerbations, age and Charlson index were analysed as categorical variables.”

Secondly, and perhaps more importantly, the authors have reported older age (clearly a non-modifiable factor) as a predictor of death. They do not state whether they believe this to be old age per se or an age related potentially modifiable factor. Have the authors collected data on smoking status, physical disability, depression, quality of life, and any psychological effects the patients may have received during the follow up period? These variables may have some effect on mortality in this exclusively male COPD patient cohort. Our open group has recently published data on 1 year mortality following hospitalisation for AECOPD in a slightly older group of subjects (mean age 73 years v 71 years in the patients studied by Soler-Cataluña and colleagues) with worse baseline spirometry (mean percentage predicted FEV1 39%). In our study age was a significant mortality predictor on either univariable or multivariate analysis. Quality of life, level of disability, severity of depression, readmission, use of long term oxygen therapy, and duration of original admission (all of which are arguably related to age) were all univariable predictors of 12 month mortality, with only the quality of life score remaining a significant predictor on multivariate analysis.

We wonder whether the inclusion of age related variables in the study by Soler-Cataluña et al. together with the use of age as a continuous variable, might have resulted in qualitatively or quantitatively different conclusions regarding the effect of age on prognosis. However, the inclusion of duration of original admission and of frequency of readmission in our own list of predictors would support their suggestion that severe AECOPD could have an adverse impact on longer term mortality.

References


Authors’ reply

We wish to thank Dr Yohannes for his interest and comments on our study and have the following comments on the questions he raises.

Firstly, although it is true that in some cases the transformation of continuous variables into dichotomised variables my induce some changes in the results obtained, in other cases the use of continuous data may conceal some partial effect, particularly if the predictive relation is non-linear. In fact, in our study the only age group to show a poorer prognosis were those aged ≥75 years (odds ratio (OR) 5.26, 95% CI 2.70 to 10.24). In the same way, categorisation of the number of exacerbations allowed us to review the differential effect of repeated exacerbations. For these reasons, and in order to make interpretation of the results easier, we...
Radiation risk of screening with low dose CT

R L Karadi

Thorax 2006 61: 548

Updated information and services can be found at:
http://thorax.bmj.com/content/61/6/548.1

These include:

References
This article cites 8 articles, 2 of which you can access for free at:
http://thorax.bmj.com/content/61/6/548.1#BIBL

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/