Effect of dichotomising age in multivariate model analysis

A M Yohannes, M J Connolly, J J Soler-Cataluña, M A Martínez-Garcia and P Román Sánchez

Thorax 2006;61:548-549

Updated information and services can be found at: http://thorax.bmj.com/cgi/content/full/61/6/548-a

These include:

References
This article cites 8 articles, 6 of which can be accessed free at: http://thorax.bmj.com/cgi/content/full/61/6/548-a#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 article

Topic collections
Articles on similar topics can be found in the following collections

Chronic Obstructive Airways Disease (473 articles)

Notes

To order reprints of this article go to: http://www.bmjournals.com/cgi/reprintform

To subscribe to Thorax go to: http://www.bmjournals.com/subscriptions/
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 importance 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 (95% credibility interval 0.5% to 5.5%) more radiation from screening would be 1.8% that, if 50% of all current and former smokers and radiation exposure.

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 may 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 considered as one of the limiting factors for such screening.

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 predictors of 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 group.

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 misleading, both in terms 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, physical support, disability, depression, quality of life, and any potential effect of repeated exacerbations on mortality? Their 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 own 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 the only significant predictor on either univariate 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 univariate 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 our suggestion that severe AECOPD could have an adverse impact on longer term mortality.

References


www.thoraxjnl.com

Competing interests: none declared.

References

decided to apply categorisation of some continuous variables in our study. On the other hand, we should mention that this transformation of variables did not modify the results, as both age and the number of exacerbations behaved as independent prognostic factors on inclusion in the model as continuous variables. Specifically, in this predictive equation, age proved to be an independent prognostic variable with an OR of 1.06 (95% CI 1.01 to 1.11). The same applies to the number of exacerbations with an OR of 1.20 (95% CI 1.03 to 1.39).

Secondly, with regard to the role of age as a predictor of mortality, different studies involving both stable patients and acute cases have also found age to be an adverse prognostic factor. Despite such evidence, we consider the hypothesis suggested by Yohannes—that other age related and potentially modifiable variables would determine the prognostic effect attributed to age—to be very interesting. Unfortunately, in our analysis or define such an effect are included in the model as continuous variables.

In conclusion, age dichotomisation did not substantially change the results and conclusions drawn in our study. Re-analysis of the data using continuous (non-dichotomised) variables continues to suggest that severe exacerbations are independent predictors of mortality.

References

Diaphragm paralysis after nephrectomy

We read with interest the case report by Moore et al. on the diaphragm weakness of two patients after anatomically distant surgery. We are currently following a patient who had bilateral paralysis of the diaphragm after a nephrectomy for renal cancer. The patient, a 60 year old male non-smoker without any concomitant cardiac or lung disease, underwent surgery in August 2004 and immediately after the operation he complained of orthopnoea. Chest radiographs showed the elevation of both hemidiaphragms, which was not present preoperatively, along with a restrictive ventilatory defect detected by spirometry (TLC 61% predicted, VC 72% predicted, FEV1 67% predicted, FEV1/VC 70%). The diagnosis of bilateral paralysis was confirmed by electromyography and respiratory muscle strength assessment in October 2004. Because of a nocturnal oxygen desaturation, he started with nightly non-invasive ventilation. Up to now he has also undergone periodic courses of inspiratory muscle training. In 2004 and 2005 he was checked regularly and an improvement in VC was found, but not in Pimax nor in TwPdi. Moreover, at the December 2005 check-up the nocturnal oxygen desaturation had significantly improved and the patient had stopped the ventilation support.

Diaphragm paralysis is associated with renal cancer and is considered to be a paraneoplastic syndrome. In our patient, however, the temporal link between the surgical operation and paralysis is evident. Moreover, during the operation and after the perioperative period our patient did not undergo central venous cannulation, nor did he experience any electrolyte disturbance. Postoperatively, the patient also underwent magnetic resonance imaging which excluded any injury to his spinal cord. The similarity between the case histories presented by Moore et al. and our patient therefore appears to be evident.

In addition we think the patient’s follow up is of interest. So far, the patient’s VC has recovered 0.48 l, being 4.21 and 86% of predicted value in orthostatism. Furthermore, VC now accounts for 2.3 l and 47% of predicted in clinostatism and can assure a normal oxygen saturation during sleep. However, the patient’s diaphragm is still paralysed, since the TwPdi value is extremely low (3 cm H2O) and the fall in VC from orthostatism to clinostatism is significant (45%). The recovery in VC might be due only to the increase in strength of the accessory inspiratory muscles, probably due to the respiratory muscle training courses. This finding further supports the recommendation by Moore et al. to measure the diaphragm strength separately from global inspiratory muscle strength in patients with raised hemidiaphragms after surgery.

A Chetta, M Aiello, D Olivieri
Department of Clinical Sciences, Section of Respiratory Diseases, University of Parma, Italy

Correspondence to: Professor A Chetta, Clinica Pneumologica, Dipartimento di Scienze Cliniche, Padiglione Rasori, Viale G Rasori 10, 43100 Parma, Italy; chetta@unipr.it
doi: 10.1136/thx.2006.059956

References