Conventional RIA underestimates cortisol suppression in the presence of prednisolone

Concerns about suppression of the hypothalamic pituitary adrenal (HPA) axis by systemic steroids as well as by inhaled corticosteroids have long been held since their introduction. Several studies have suggested that inhaled corticosteroids can replace oral corticosteroids during exacerbations of asthma and in severe asthma. We have recently published a study in which treatment of unstable asthmatic patients for 2 weeks with high doses of inhaled fluticasone resulted in a greater improvement in airway hyperresponsiveness than oral prednisolone. A possible explanation for this difference is that serum cortisol and cortisol levels in blood with the RIA method were used to determine a comparable decrease in serum cortisol levels by RIA. Analytical methods involving chromatographic separation of cortisol from prednisolone and its metabolites, such as high performance liquid chromatography (HPLC), circumvent this problem of interference.

We compared serum cortisol measurements by both conventional RIA and by HPLC in the same study, which was of a double blind, double dummy, three arm parallel group design. Patients received either oral prednisolone (30 mg/day), fluticasone propionate 1000 μg twice daily (FP2000), or fluticasone propionate 250 μg twice daily (FP500), both via Diskhaler dry powder inhalation. Measurements at the start of the study and after 2 weeks of treatment were performed at the same time in the morning.

The Gilson ASTED (automated sequential trace enrichment of dialysates) (www.gilson.com) automated sequential trace enrichment of dialysates) (www.gilson.com) automated sequential trace enrichment of dialysates) (www.gilson.com) automated sequential trace enrichment of dialysates) (www.gilson.com) automated sequential trace enrichment of dialysates) was used followed by separation with HPLC and detection by UV absorbency. If you have a burning desire to respond to a paper published in Thorax, why not make use of our “rapid response” option? Log on to our website (www.thoraxjnl.com), find the paper that interests you, and send your response via email by clicking on the “eletters” option in the box at the top right hand corner.

The editors will decide as before whether to also publish it in a future paper issue.

References


Smoking cessation

We welcome the study by Pelkonen et al. as a further contribution to our knowledge base on smoking cessation and its effects on pulmonary function and mortality. We feel, however, that some shortcomings in the methodology may bring into question the magnitude of the results.

Our main concern relates to the difficulties in quantifying levels of tobacco exposure. Since tobacco consumption is a continuous variable, confounding factors may occur within each group when categorised too broadly. More information about duration and levels of smoking would help to avoid this problem. No information is given as to whether intermittent quitters returned to original habits or resumed smoking at reduced levels. Beneficial effects described in this group could therefore be due to extended periods of decreased tobacco consumption rather than a period of abstinence.

There are no data provided on smoking status from 1974 to 1989. If large numbers of those classified as intermittent quitters had permanently stopped smoking by this time, the value of temporary quitting would be overestimated. Furthermore, no data exist on the continuation of periods of abstinence among intermittent quitters. If a significant proportion of this group exhibited prolonged periods of smoking cessation, the relevance of the study to short term quitters is debatable.

Even accepting the beneficial effects of intermittent quitting, we question the importance of this finding in a public health setting. Surely the main hope for public health must remain the same: permanent smoking cessation should remain the goal and is superior to intermittent quitting. However, we recognise that this finding could provide encouragement to those who have relapsed following...
an attempt to quit smoking and reassure them that their efforts have not been in vain. This could provide the motivation needed for a second and possibly successful attempt to quit.

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References
2 Leon DA. Failed or misleading adjustment for confounding. Lancet 1993;342:479–81.

Authors’ reply
Lorna Dunn and Alleen Ogilvie make an important point that the confounding effect of prolonged tobacco consumption on the decline in pulmonary function may occur when the levels of tobacco exposure are categorised too broadly. They think that the benefit of intermittent quitting on the decline in FEV0.75 during the first 15 years might have not been in vain, as they also point out that, if a considerable proportion of intermittent quitters stopped smoking permanently between 1974 and 1989, it would have led to overestimation of the value of temporary quitting. The third question concerns the duration of periods of abstinence.

In our study the data on smoking habits were recorded at baseline and in subsequent re-examinations by a standard questionnaire. The interval between examinations was usually 6 years. Intermittent quitters were either baseline past smokers who smoked in at least one of the subsequent re-examinations or baseline smokers who were quitters in one or more re-examinations but relapsed back to smoking later. To be recorded as a quitter in an examination a subject had to have given up smoking more than a year previously. During the first 15 years, 27 of 75 intermittent quitters were recorded as quitters in one examination (corresponding to at least 1 year of abstinence), 32 were recorded as quitters in two examinations (corresponding to at least 2 years of abstinence), and 16 were recorded as quitters in three examinations (corresponding to at least 3 years of abstinence).

During the first 5 years intermittent quitters reduced the number of cigarettes smoked daily compared with continuous smokers, although not significantly. To measure tobacco consumption more precisely, a new variable was constructed by computing the mean daily tobacco consumption during the first half of the follow up period and for quitting smoking during the latter half of the follow up period, intermittent quitters still lost less FEV0.75 during the whole 30 years than continuous smokers (data available from the authors on request).

In conclusion, it seems that some protection may be gained from periods of abstinence, although we agree that the main goal should be permanent smoking cessation.

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Fibrosing alveolitis in patients with RA

We read with interest the paper by Dawson et al on the prevalence of fibrosing alveolitis (FA) diagnosed by HRCT scanning in rheumatoid arthritis (RA). This well designed cross sectional study estimates the prevalence of FA at 19% in patients with RA irrespective of respiratory symptoms. This is in keeping with current literature and our earlier report of 29% in unselected patients with RA not suspected of having interstitial lung disease (ILD)2. However, neither of these studies has been sufficiently powered to assess a possible association of smoking with ILD. Smoking may adversely affect the outcome of ILD in RA and Saag et al3 suggested that smoking was the most consistent independent predictor of ILD patterns in lung function tests and chest radiographs in RA. One of our previous studies4 reported a prevalence of ILD of only 5% on HRCT scanning in a cohort of 20 never smokers with RA, while Dawson et al reported a prevalence of 11% in never smokers compared with 22% in smokers. There is therefore evidence of a trend towards an association between ILD and smoking which could be explored in a larger study. However, a sample size of 450 patients would be needed to test the hypothesis that smokers are twice as likely to develop ILD in RA than never smokers (95% confidence; power = 80%; smoker/never smoker ratio 2:1).

We agree with the authors that further work on the natural progression of FA diagnosed by HRCT scanning in RA is due. We have commenced a longitudinal prospective study of 18 RA patients with ILD diagnosed by HRCT scanning, to follow a cohort of patients with cryogenic fibrosing alveolitis (CFA) matched for age, sex, smoking, and respiratory symptoms. There are significant baseline differences in clinical and radiological features between these two groups. Clubbing and honeycomb appearance on the HRCT scan is more common in patients with CFA while ground glass appearance is more common in RA patients with ILD. The presence of rheumatoid factor appears to be protective against honeycomb in both groups. These differences in clinical and HRCT features may be important predictors of outcome.

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References

Authors’ reply
We are pleased to receive the letter from Saravanan and Kelly in response to our recent publication in Thorax.1 The association between smoking and RA associated FA is an interesting one. There is no consistent finding in the literature of smoking and RA associated FA and, as far as we are aware, no prospective HRCT based study has shown a statistically significant association between RA associated FA and smoking. In the study by Cortet et al2 68 patients with RA were prospectively studied with HRCT scanning. Active smoking was less prevalent than in the North of England and the ratio of smokers to non-smokers was 1:3. No statistical association was seen linking smoking with interstitial lung disease (ILD) and a prevalence of 20% of ILD (17% ground glass pattern and 2.9% reticular pattern) was still found. It is true that in our study the absolute risk of ever smoking cannot be excluded as a factor for FA as the number of lifelong non-smokers is small; however, the pack year data are adequately powered to show no statistically significant difference.

With regard to the paper by Rajasekaran et al3 we feel it necessary to point out that the patients in their study with FA and RA had the diagnosis confirmed by HRCT scanning and, in addition, were symptomatic (dyspnoea, bibasal crackles, restrictive pulmonary function tests, and chest radiographic changes of FA). We are sure this will provide very valuable information about the progression of RA in patients with RA but it will not add to our knowledge on the outcome of HRCT changes detected at a subclinal stage. Rajasekaran et al found honeycombng on the HRCT scan in three of 18 patients with RA associated ILD and in four of 18 patients with CFA; this difference is not statistically significant.4 None of these patients were rheumatoid factor positive, which has led the authors to postulate that rheumatoid factor may be protective against honeycombng in ILD. These findings are in direct contrast to those of Muller-Leisse et al who found higher levels of rheumatoid factor to be associated with ground glass changes and honeycombng on the HRCT scan, and also to McDonagh et al5 who reported that at least five of 16 patients (31%) had honeycombng and were rheumatoid factor positive. This finding is particularly interesting given that there is evidence in the literature of smoking being associated with seropositivity for rheumatoid factor in patients with and without RA.6 We
would suggest that larger studies need to be undertaken and explored for confounding factors such as smoking before a statement can be made that rheumatoid factor is protective against honeycomb.

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References

Measuring granulocyte apoptosis in airway inflammation

We read with interest the paper by Turlej et al describing enhanced survival of lung granulocytes in an animal model of asthma.1 As discussed by the authors, modulation of immune cell apoptosis is likely to be important in controlling inflammatory processes, and the paper enhances our understanding of this.

However, we feel that there are some methodological problems with the study. Firstly, the animal model they describe, though having some similarities with asthma, is closer to chronic obstructive pulmonary disease (COPD). Neutrophils are the predominant inflammatory cells in this model. This condition is often known as COPD in horses.2

Secondly, although the authors refer to the use of annexin V (AV) and propidium iodide (PI), they do not describe the methodology used or how they interpreted the staining with AV and PI. This is important because there are controversies surrounding the interpretation of this method of assessing apoptosis.3 The interpretation of the various staining patterns is controversial. In addition, at least two methods should be used to confirm apoptosis;4 only one is used in the study.

It is noted that the blood granulocytes are isolated by use of a density gradient. Density gradients may interfere with some neutrophil functions5 and this must be borne in mind when interpreting these results. Additionally, BAL granulocytes from healthy horses were isolated by use of a density gradient, whereas this was not used for the diseased horses. This difference of methods introduces a potential bias into the study. We have previously attempted to isolate equine neutrophils from human BAL fluid with no success (unpublished observations) and would be interested to know if the authors achieved this separation easily. We are also surprised at the viability of >90%. Cell viability is likely to diminish with increasing rates of apoptosis, and it is notable that the BAL granulocytes from healthy horses have apoptotic rates of around 40%. This study is interesting, but the methodological issues raised must be considered in interpreting the results.

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References

Authors’ reply

We thank Dr Kelly and colleagues for their interest in our paper. In the past equine heaves was called COPD but, because equine heaves is completely different from human heaves is therefore not surprising to find 40% apoptotic (AV+ ) cells in a population where nearly all the cells (>90%) are TB–.

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References

CORRECTION

In the Programme and Abstracts of the British Thoracic Society Winter Meeting 2001 published in Thorax 2001; 56(Supplement III), an error occurred in abstract S130 “Management of pneumothorax in a district general hospital” by Al-Atou M, Al-Aloul M, et al which appeared on page iii40. The name of the second author which appeared as KU Torrey should have been KU Toorai.
Measuring granulocyte apoptosis in airway inflammation

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