

Reasons for poor asthma control

6: Smoking

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There is clear evidence now that concurrent smoking adversely impacts asthma control. This is thought to be:

- because of relative steroid resistance among smokers and/or
- because of concomitant chronic obstructive pulmonary disease (COPD) or asthma misdiagnosed as COPD among the smokers.

Three reasons have been proposed why inhaled steroid therapy fails more often in smokers:

1. Smokers have a higher percentage of neutrophils in induced sputum, and steroids are not very effective in reducing neutrophils.
2. The oxidative stress produced by smoking impairs the activity of histone deacetylase-2 (HDAC2), resulting in reduced anti-inflammatory activity of steroids.
3. Smoking triggers leukotriene production in patients with asthma, and leukotrienes are not reduced by steroid therapy.

Several studies of smokers with asthma have reported no improvement in lung function with inhaled steroid therapy (Figure),¹ as well as no effect of even high-dose inhaled steroids on eosinophil and neutrophil activity.

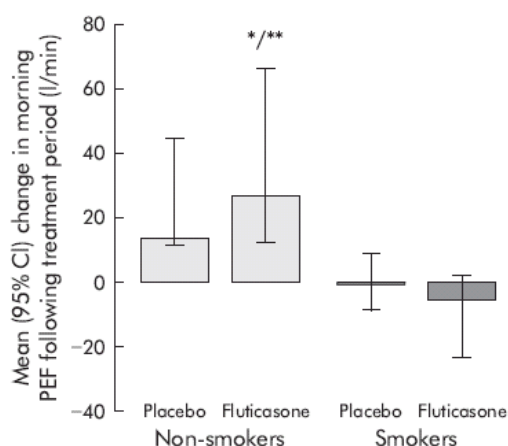


Figure. Mean (95% CI) peak expiratory flow (L/min) in non-smoking and smoking patients with mild asthma after treatment with inhaled placebo or fluticasone propionate 1000 µg/day for 3 weeks. *p=0.016, greater than non-smokers after placebo; **p=0.001, greater than smokers after fluticasone.

From Chalmers GW et al. *Thorax*. 2002;57:226–30¹ and reprinted with permission from the BMJ Publishing Group.

Clinical approach to suspected smokers with asthma

It is important to identify the current smoking habits of patients with asthma, particularly those whose symptoms are poorly controlled. Patients who do not admit to smoking during an oral history may be more likely to admit to smoking on a written self-completed questionnaire, as they may feel less threatened.

For patients who are suspected or confirmed smokers, the consultation should include investigations to exclude COPD. The IPCRG guidelines for diagnosing respiratory diseases in primary care² include a tool to help differentiate between asthma and COPD (http://www.thepcrj.org/journ/view_article.php?article_id=137&volissue=12).

The ideal therapy for smokers with asthma is to quit smoking. The IPCRG has published guidance on smoking cessation (<http://www.theipcr.org/smoking/index.php>). The percentage of neutrophils in induced sputum falls after patients quit smoking; thus, while neutrophils do not respond to steroids they do respond to smoking cessation.

For patients who continue to smoke, alternatives to inhaled steroids for treating asthma include leukotriene modifiers, theophylline, or possibly high-dose inhaled steroids (up to 1600 µg/day),³ although this last alternative is not yet fully supported by clinical trial evidence.

References

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2. Levy ML, Fletcher M, Price DB, et al. International Primary Care Respiratory Group (IPCRG) Guidelines: diagnosis of respiratory diseases in primary care. *Prim Care Respir J*. 2006;15:20–34.
3. Lazarus SC, Chinchilli VM, Rollings NJ, et al. Smoking affects response to inhaled corticosteroids or leukotriene receptor antagonists in asthma. *Am J Respir Crit Care Med*. 2007;175:783–90.