Author's response to reviews

Title: Effects of sex hormones on bronchial reactivity during the menstrual cycle

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Increasing evidence suggest that sex hormones may have a crucial role in asthma, in particular, estrogens has received considerable attention in this regard. Perimenstrual asthma (PMA) is defined as the exacerbation of the respiratory symptoms in some asthmatic premenopausal females during the premenstrual phase during the first days of menstruation. However, the roles of gender and sex hormones in asthmatic women are complex and not completely understood. A more complete understanding of the activities of hormones in regulating asthma exacerbations has potential to improve symptom management and decrease the disease burden considerably. The aim of this study was to investigate the effect of the menstrual cycle, specifically of the luteal and follicular phases and sex hormone levels, on bronchial reactivity (BR) in a group of PMA women. To this purpose we used 36 pre-menopausal women in whom we evaluated sex hormone levels and mediators of bronchial smooth muscle contraction. Our study showed that about 70% of the asthmatic women had increased BR in the follicular phase of menstrual cycle with a significant correlation between BR and serum testosterone levels. A marked increases in sputum testosterone levels together with significant increases in sputum cAMP concentrations were observed during the luteal phase of PMA patients, suggesting that testosterone contributes to the pathophysiology of PMA. We excluded a direct effect of testosterone on inhibiting PDE activity since the incubation of PDE with testosterone in vitro did not reduce PDE catalytic activity. Our data show that BR was increased in the follicular phase of the menstrual cycle in women and associated with lower cAMP levels in sputum samples which may contribute to bronchoconstriction. These results also suggested a link between PMA and testosterone levels. However, whether these findings are of clinical significance in terms of the management of asthma or asthma exacerbations during the menstrual cycle needs further investigation.

We believe that BMC Pulmonary Medicine is the most appropriate frame, because our data could indicate new approaches in the therapy of asthma and its negative consequences.