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Title: Airway macrophage phagocytosis after high altitude residence in children with asthma

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Body: Airway macrophages (AM) perform crucial function of clearing pathogens and presenting antigens. AM phagocytosis in adults with mild asthma is enhanced compared to healthy individuals and possibly related to higher level of activation of macrophages[1]. At high altitude there is reduced exposure to allergens. However it is not known what effect this has on the macrophage phagocytosis. The aim was to determine the phagocytic function of airway macrophages at baseline (T0) and after stay at high altitude (T1). Sputum induction was performed at T0 and T1 in children with mild to moderate asthma attending High Altitude Children's Asthma Center in Misurina. Differential count was obtained by counting 400 non-squamous cells (eosinophilic asthma ≥ 3%). AM were isolated by adherence and cultured with FITC labelled heat killed staph aureus in the ratio of 1:10 (AM: bacteria). One hundred macrophages were imaged using confocal microscope. The median bacterial count/AM was calculated using Image J and Cell profiler software. The groups were compared using paired and unpaired t-tests. There was no significant difference (p = 0.3) between median bacterial count in eosinophilic (n=16) [Mean (SD)] [77.56(36.6)] and non-eosinophilic asthma (n=8) [68.22(11.5)] at T0. Children at T1 (n=19 pairs) had significantly lower i) median bacterial count [Mean (SD)] [p = 0.006, 39.55(4.51) vs 73.26 (39.42)] than at T0. The sputum macrophages in children with mild to moderate asthma are equally phagocytic in eosinophilic or non-eosinophilic groups. After stay at high altitude macrophages were less phagocytic (possibly due to return to normal level of activation). [1]Lay JC et al Thorax 2009; 64:313–320.