

Abstract

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Choline supplementation reduces oxidative stress in mouse model of allergic airway disease.

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BACKGROUND: Asthma is a multi-factorial inflammatory disease associated with increased oxidative stress and altered antioxidant defences. We have evaluated the effect of choline on oxidative stress in a mouse model of airway disease.

MATERIALS AND METHODS: Balb/c mice were sensitised with 100 mug of ovalbumin on days 0 and 14, and challenged with aerosolized ovalbumin on days 25-27. Mice were administered 1 mg kg(-1) of choline via oral gavage or intranasal route on days 14-27. Mice were also administered 100 mg kg(-1) of alpha-lipoic acid as standard antioxidant. Total cell counts, eosinophils and eosinophil peroxidase (EPO) activity were determined in bronchoalveolar lavage (BAL) fluid. Reactive oxygen species (ROS), lipid peroxidation and isoprostanes levels were measured in BAL fluid. IL-13 and tumour necrosis factor-alpha (TNF-alpha) levels were also measured in BAL fluid and spleen cell culture supernatant. Nuclear factor kappaB (NFkappaB) p65 protein expression was measured after last ovalbumin challenge in nuclear and cytosolic extracts of lungs.

RESULTS: Compared with ovalbumin-challenged mice, choline and alpha-lipoic acid treated mice had significantly reduced eosinophilic infiltration and EPO activity in BAL fluid. Choline and alpha-lipoic acid treatment reduced ROS production and isoprostanes level significantly in BAL fluid and thus suppressed oxidative stress. Choline and alpha-lipoic acid administration by either route decreased lipid peroxidation levels and down regulated NFkappaB activity. Further, choline and/or alpha-lipoic acid treatment suppressed TNF-alpha level significantly as compared with that of ovalbumin-challenged mice.

CONCLUSIONS: Choline administration reduces oxidative stress possibly by modulating the redox status of the cell and inhibits inflammatory response in a mouse model.

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