

# Decreased levels of coenzyme Q<sub>10</sub> in patients with bronchial asthma

**Background:** The contribution of free oxygen radicals in the pathogenesis of bronchial asthma is generally accepted. The modulation of antioxidative defence by supplementation with antioxidants represents additive therapy in complex management of disease. The aim of the study was to assess the levels of coenzyme Q<sub>10</sub>,  $\alpha$ -tocopherol, and  $\beta$ -carotene both in plasma and whole blood, and malondialdehyde (MDA) and eosinophil cationic protein (ECP) in plasma of asthmatics (As).

**Methods:** Fifty-six As (15 males and 41 females) aged from 19 to 72 years (mean age 46 years) suffering from allergic asthma were enrolled into the study. The control group comprised 25 healthy volunteers (16 males, 9 females) aged 25–50 years.

**Results:** The concentrations of CoQ<sub>10</sub> decreased significantly both in plasma and whole blood, compared with healthy volunteers ( $0.34 \pm 0.15 \mu\text{mol/l}$  vs.  $0.52 \pm 0.15 \mu\text{mol/l}$ ,  $0.33 \pm 0.14 \mu\text{mol/l}$  vs.  $0.50 \pm 0.13 \mu\text{mol/l}$ ,  $P < 0.001$ ,  $P < 0.001$ , respectively). The levels of  $\alpha$ -tocopherol were decreased both in plasma and whole blood in comparison with controls [ $24.10 \mu\text{mol/l}$  (19.8; 30.5), vs.  $33.20 \mu\text{mol/l}$  (28.25; 38.05),  $17.22 \pm 6.45 \mu\text{mol/l}$  vs.  $21.58 \pm 7.92 \mu\text{mol/l}$ ,  $P = 0.006$ ,  $P = 0.01$ , respectively]. The levels of MDA were elevated over the reference range in both groups (reference range  $< 4.5 \mu\text{mol/l}$ ). No changes were seen in  $\beta$ -carotene concentrations. Positive correlation was found between whole blood CoQ<sub>10</sub> and  $\alpha$ -tocopherol concentrations.

**Conclusion:** Results of the study suggest a possible contribution of suboptimal concentrations of CoQ<sub>10</sub> on antioxidative dysbalance in As and provide a rationale for its supplementation.

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Key words:  $\alpha$ -tocopherol;  $\beta$ -carotene; allergic asthma; coenzyme Q<sub>10</sub>; eosinophil cationic protein; malondialdehyd.

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