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Acta Medica Iranica
2009;47(4) : 79-87

The Opposite Associations of Lycopene and Body Fat Mass with HumoralImmunity in Type 2 Diabetes Mellitus: A Possible Role in Atherogenesis

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Abstract:

This study examined the possible effects of lycopene at physiological dosage and body fat mass on the humoral immune response in patients with type 2 diabetes mellitus (T2DM).

A total of 35 patients with Typ2 diabetes mellitus from both sexes aged 54±9 yrs from the Iranian Diabetes Society were introduced into a double blind placebo controlled clinical trial conducted for 2 months. After a 2-week lycopene free diet washout period, patients were allocated to either lycopene supplementation group (10mg/d) (n=16) or placebo age- and sex matched group (n=19) for 8 weeks.

Patients were instructed to keep their diets and physical activities as unchanged as possible.

Lycopene supplements increased serum lycopene levels ($p<0.001$). While intake of dietary energy and nutrients did not change in either groups, the ratio of total antioxidant capacity to malondialdehyde increased significantly in the lycopene group ($p=0.007$). There was an inverse correlation between serum levels of lycopene and those of IgG ($r= -0.338$, $p=0.008$). On the contrary, changes of serum levels of lycopene directly correlated with those of IgM ($r=0.466$, $p=0.005$). Interestingly, changes of the amount of fat mass correlated directly with those of serum IgG ($r=0.415$, $p=0.044$) but inversely with of serum IgM ($r= -0.469$, $p=0.021$).

While truncal fat might promote adaptive humoral immunity, lycopene probably by inhibiting MDA-LDL formation might attenuate T cell dependent adaptive (pro-atherogenic) humoral immune response. These findings may have preventive implications in long term diabetic complications, notably atherogenesis.

Keywords:

Fat mass ، Lycopene

TUMS ID: 3609

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