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The effect of lycopene on the total cytochrome P450, CYP1A2 and CYP2E1

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Abstrak

Tujuan Beberapa penelitian terakhir melaporkan bahwa karotenoid memiliki kemampuan untuk memodulasi sistem metabolisme xenobiotik. Penelitian ini dirancang untuk menyelidiki pengaruh likopen suatu karotenoid non-provitamin A terhadap enzim sitokrom P450 total, CYP1A2 dan CYP2E1 mikrosom hati tikus. Metode Fraksi mikrosom diperoleh dengan metode sentrifugasi diferensial yang dikombinasi dengan agregasi mikrosom menggunakan ion kalsium. Kadar sitokrom P450 total, aktivitas CYP1A2 (asetanilid-4-hidroksilase) dan CYP2E1 (p-nitrofenol hidroksilase) dipelajari pada mikrosom hati tikus Sprague-Dawley jantan. Hewan coba diberi likopen dalam dosis 0 mg/kgBB/hari, 25 mg/kgBB/hari, 50 mg/kgBB/hari atau 100 mg/kgBB/hari per oral selama 14 hari. Data dianalisis dengan uji ANOVA. Hasil Kadar sitorom P450 total dan aktivitas asetanilid-4-hidroksilase tidak dipengaruhi oleh semua perlakuan. Aktivitas CYP2E1 menurun bermakna oleh pemberian likopen 100 mg/kgBB/hari selama 14 hari (7,88 + 2,04 vs 12,26 + 2,77 n mol/min/mg prot). Kesimpulan Hasil penelitian ini menunjukkan bahwa likopen tidak mempengaruhi sitokrom P450 total dan aktivitas CYP1A2 (asetanilid 4-hidroksilase), namun memiliki efek inhibisi pada aktivitas CYP2E1 (p-nitrofenol hidroksilase).
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Abstract
Aim Some carotenoids such as canthaxantin, astaxanthin and beta apo-8?-carotenal were reported to have modulatory effect on the cytochrome P450. The present study was conducted to investigate the effects of lycopene, a nonprovitamin A carotenoid, on microsomal cytochrome P450, CYP1A2 and CYP2E1. Methods Total cytochrome P450 levels, CYP1A2 and CYP2E1-catalyzed reactions (acetanilide 4-hydroxylation and p-nitrophenol hydroxylation) were studied in the liver microsomes of male Sprague Dawley rats. Microsomes were prepared using differential centrifugation combined with calcium aggregation method. Lycopene was orally administered in the dosages of 0, 25, 50 or 100 mg/kgBW/day for 14 days in a repeated fashion. Data were analyzed using ANOVA test. Results Total cytochrome P450 level and acetanilide 4-hydroxylase activity were unaffected by any of the treatments. The CYP2E1 probe enzyme (p-nitrophenol hydroxylase) was signifi cantly reduced by repeated administration of 100 mg/kgBW/day lycopene (7.88 + 2.04 vs 12.26 + 2.77 n mol/min/mg prot). Conclusion The present results suggest that lycopene does not affect the total cytochrome P450 or CYP1A2 activity but it inhibits the activity of CYP2E1 (p-nitrophenol hydroxylase) in the rat.