Curcumin protects against failure to generate a transmembrane potential and protein aggregation of rat liver mitochondria induced by tert-butylhydroperoxides

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Abstrak

Kurkumin, bahan aktif tanaman kurkuma diduga bermanfaat dalam pengobatan penyakit hati. Dalam penelitian terdahulu, diperlihatkan efek protektif kurkumin terhadap peroksidasi lipid dan swelling mitokondria yang diisolasi dari hati tikus karena pemberian t-butilhidroperoksida (t-BuOOH). Dalam penelitian ini, pemberian t-BuOOH 90 M menyebabkan mitokondria tidak dapat membentuk potensial transmembran (m). Kegagalan pembentukan potential transmembran diduga berhubungan dengan transisi permeabilitas dan apoptosis. Dari 3 dosis kurkumin yang dicoba (0,5 M, 2,5 M dan 5,0 M), ternyata kurkumin dosis 2,5 M dapat mencegah kegagalan pembentukan potensial transmembran akibat t-BuOOH (79,13 + 6,28%). Pemeriksaan elektroforesis protein mitokondria menunjukkan kurkumin 1000 M dapat mencegah agregasi protein yang terjadi akibat t-BuOOH. Dari penelitian ini diperlihatkan efek proteksi kurkumin terhadap kerusakan sistem pembentukan energi dan protein mitokondria yang disebabkan oleh t-BuOOH. (Med J Indones 2007; 16:139-45)

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Curcumin, an active ingredient of curcuma plant has been thought to be beneficial in the treatment of liver diseases. In the previous studies, we have shown the protective effects of curcumin against lipid peroxidation and swelling of the rat liver mitochondrial preparation induced by tert-butylhydroperoxide (t-BuOOH). In the present study, the administration of t-BuOOH of 90 M caused the mitochondria failed to generate a transmembrane potential (m). Of 3 doses of curcumin administered (0.5 M, 2.5 M dan 5.0 M) the maximum protective effect against failure to generate a transmembrane potential caused by t- BuOOH was obtained by 2.5 M of curcumin (79.13 + 6.28%). Further, curcumin of 1000 M could prevent protein aggregation formation caused by t-BuOOH in the electrophoretogram. This study shows the protective effects of curcumin against damaged of energy production system and protein of the mitochondria caused by t-BuOOH. (Med J Indones 2007; 16:139-45