Studi invivo efek mangiferin terhadap toksisitas doksorubisin pada testis tikus = Invivo studies of mangiferin effects againts doxorubicin toxicity on testicular rat / Supraja Dwiyono

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Abstrak

[ABSTRAK
Doksorubisin merupakan salah satu antikanker golongan antrasiklin yang efektif, untuk keganasan di darah. Akan tetapi, seperti antikanker konvensional pada umumnya, penggunaan doksorubisin dapat menyebabkan berbagai efek samping pada organ lain, misalnya pada testis sehingga penggunaannya di klinis menjadi terbatas. Hal ini disebabkan karena mekanisme antikanker doksorubisin dapat juga menimbulkan toksisitas pada testis. Peningkatan stress oksidatif adalah salah satu mekanisme dapat menyebabkan kerusakan pada organ tersebut. Mangiferin sebagai zat antioksidan alami, terkandung dalam Mangifera Indica L. diperkirakan dapat digunakan untuk mengurangi toksisitas testis. Namun sampai saat ini, belum ada penelitian yang mengeksplor efek proteksi mangiferin terhadap kerusakan oksidatif testis yang diinduksi doksorubisin.
Penelitian ini menggunakan tikus jantan Sprague Dawley, yang dibagi menjadi empat kelompok. Masing-masing kelompok terdiri dari enam ekor tikus. Tikus pada kelompok kontrol negatif diberikan doksorubisin secara intraperitoneal (dosis total 15 mg/kgBB) dan kelompok normal diberikan NaCl 0,9%. Mangiferin (dosis 30 dan 60 mg/kg BB) diberikan oral selama tujuh minggu. Setelah, tujuh minggu tikus dimatikan dan testis dikumpulkan untuk analisis parameter stress oksidatif biokimia kadar MDA (malonedyaldehide), aktivitas SOD (Superoxide Dysmutase), perubahan histologi dan apoptosis kaspase-9 dan kaspase-12. Hasil penelitian menunjukkan bahwa pemberian doksorubisin selama dua minggu dapat meningkatkan kadar MDA, menyebabkan kerusakan sel spermatogenik, sel Sertoli dan penciutan diameter tubulus seminiferus testis, peningkatan ekspresi kaspase-9 di sisi luminal yang diberikan doksorubisin. Pemberian mangiferin dosis 30 dan 60 mg/kg BB selama tujuh minggu dapat mengurangi kerusakan sel spermatogenik dan sel Sertoli tubulus seminiferus testis, penurunan kadar MDA dan penurunan ekspresi kaspase-9 pada kelompok perlakuan diberikan doksorubisin dan mangiferin. Perbaikan parameterparameter ini mengindikasikan bahwa mangiferin mempunyai efek proteksi terhadap kerusakan sel spematogenik dan sel sertoli tubulus seminiferus testis tikus yang diberikan doksorubisin.
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ABSTRACT
Doxorubicin, one of the anthracycline anticancer class, is effective especially in blood malignancy. However, as in the general use of the conventional anticancer-drugs.

Doxorubicin can cause various side effects in other organs, such as the testes so that its use in clinical become limited. This is because of the anticancer mechanism can cause cytotoxicity on testes. The increased oxidative stress is the main mechanism that can be the causal. Mangiferin as a natural antioxidant substance, contained in Mangifera Indica L., is expected to reduce the toxicity. The Antioxidants are expected to reduce the toxicity of the testes. But until now, no studies have explored the effects of mangiferin protection against oxidative damage induced testicular doxorubicin.

This study used male Sprague Dawley rats, which were divided into four groups. Each group consisted of six mice. Rats in the negative control group was given intraperitoneal doxorubicin (total dose 15 mg/kg) and the normal group was given normal saline 0.9%. Mangiferin (doses of 30 and 60 mg/kg) was administered orally for seven weeks to the treatment gtoups (both DOX and MAG were given). After seven weeks-off, testes of mice were collected for analysis of biochemical parameters i.e. oxidative stress levels of MDA and SOD activity, histology and apoptosis of the caspase-9 and of the caspase-12. The results showed that administration of doxorubicin for two-weeks can cause damage to Sertoli, spermatogenic cells and shrinking of diameter of testicular seminiferous tubules, increasing the levels of MDA, increasing in the expression of caspase-9 on the luminal side in the treatment group was given doxorubicin. This possibility of the doxorubicin dose given is too toxic to the testes in this study. Mangiferin dose administration of 30 and 60 mg / kg for seven-weeks can reduce the damage of Sertoli and spermatogenic cells of the testicular seminiferous tubules, decrease levels of MDA, reduce Sertoli, spermatogenic cell and diameter of the testicular seminiferous tubulus damage, decrease caspase-9 expression only on luminal side of the seminiferus tubulus in the groups given both of doxorubicin and mangiferin. these parameters indicate that mangiferin, which has antioxidant?s activity, provides protective effects against oxidative damage in spematogenic and Sertoli cell testicular seminiferous tubules of mice given doxorubicin, Doxorubicin, one of the anthracycline anticancer class, is effective especially in blood

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