Pengaruh pemberian minyak buah merah (pandanus conoideus lam) pada hati tikus yang cedera akibat D-galaktosamin = Red Fruit (Pandanus conoideus Lam) oil effect on rats liver injured by D-galactosamine

Tena Djuaritina, author

Abstrak

Pendahuluan : Minyak buah merah (Pandanus conoideus Lam) sebagai suplemen antioksidan dilaporkan mengandung komposisi gizi Iengkap diantaranya R-karoten dan a-tokoferol.

Objektif
Tujuan penelitian ini melihat pengaruh minyak buah merah Pandanus conoideus Lam pada hati tikus yang cedera akibat D-galaktosamin.

Metode
Penelitian ini dilakukan terhadap tikus putih jantan strain Sprague-Cawley , berumur 2-3 bulan, dengan berat badan 120-150 gram. Pada penelitian ini digunakan rancangan acak. Dibagi dalam lima kelompok, masing-masing kelompok enam ekor, mendapat perlakuan selama empat minggu. Kelompok kontrol (kelompok 1) diberi air, kelompok diberi MBM (kelompok 2) , kelompok diberi D-galaktosamin (Kelompok 3), kelompok diberi minyak buah merah selama satu minggu kemudian diberikan D-galaktosamin (Kelompok 4), kelompok diberi minyak buah merah dan D-galaktosamin secara bersamaan. (Kelompok 5) Dosis MBM yang digunakan l ml/ kgBBlhari per oral, dosis D-galaktosamin 200 mgiKgBBfminggu secara intraperitoneal. Parameter yang diuji adalah MDA plasma, MDA hati, GPT plasma, GPT hati, berat badan, berat hati, dan gambaran histopatologik hati. Data hasil pengukuran antara kelompok perlakuan dilakukan dengan mengukur koefisien varian. Hasil data berdistribusi normal dilanjutkan uji parametrik 1 way Anova kemudian dengan uji post hoc Turkey. Hasil data perbandingan tiap minggu yang berdistribusi normal dilakukan uji parametrik 2 way Anova, kemudian dilanjutkan dengan uji multiple komparasi Bonferroni. Hasil data berdistribusi tidak normal maka dianalisa dengan uji non parametrik Kruskall wallis dan dilanjutkan dengan uji Tamhane_ Data yang diperoleh dad pembacaan skala diolah dengan cara krostabulasi, kemudian dilanjutkan dengan uji Chi-Square.

Hasil
Hasil pengukuran MDA plasma menunjukan D-galaktosamin ini dapat meningkatkan MDA plasma setiap minggunya; hasil ini menunjukan bahwa D-galaktosamin mengakibatkan kenusakan oksidatif molekul lipid sejak awal pengamatan pada minggu pertama. Tampaknya efek protektif MBM terhadap D-galaktosamin masih ada pads minggu pertama, hal ini mungkin disebabkan oleh antioksidan yang terdapat dalam MBM pads minggu pertama masih dapat menetralisir stress oksidatif yang ditimbulkan oleh D-galaktosamin. Disamping itu, mungkin D-galaktosamin belum bekerja maksimal merusak pada minggu pertama. Pada kelompok MBM + D-galaktosamin hash MDA plasma Iebih tinggi dibandingkan kelompok D-galaktosamin, mungkin ini dikarenakan stress oksidatif yang ditimbulkan MBM + D-galaktosamin Iebih

tinggi dibandingkan D-galaktosamin itu sendiri. Secara statistik MDA jaringan hati, menunjukkan D-galaktosamin mengakibatkan kerusakan oksidatif. Juga pada MBM sendiri menyebabkan stress oksidatif, sehingga bila diberikan bersamaan dengan D-galaktosamin kerusakan yang diakibatkannya menjadi lebih tinggi, dibandingkan dengan hanya diberi D-galaktosamin. Hasil MDA jaringan hati menunjukkan bahwa MBM bersifat toksik terhadap hati, sehingga menyebabkan peroksidasi lipid.

Dari hasil pemeriksaan GPT plasma, disimpulkan D-galaktosamin mempunyai efek merusak hati, basil yang didapat juga mulai terlihat pada minggu ke-2 dan bila diberi bersamaan dengan MBM ternyata GPT plasma melonjak lebih tinggi. Peningkatan ini mengindikasikan, bahwa MBM berpotensi merusak sel hati. Hasil pemeriksaan GPT jaringan hati juga menunjukkan D-galaktosamin menyebabkan kerusakan jaringan hati; dan MBM sendiri membuat kerusakan struktur, sehingga bila diberi lebih lama, yaitu satu minggu sebelumnya yang dimaksudkan untuk perlindungan, temyata kerusakan yang terjadi lebih tinggi.

Dari hasil pengukuran berat hati disimpulkan bahwa D-galaktosamin ini meningkatkan berat hati secara bermakna, karena D-galaktosamin ini mempunyai efek merusak sel hati. Dan MBM juga menunjukkan terjadinya peningkatan berat hati, jadi disimpulkan MBM tidak dapat memberi perlindungan terhadap sel hati.

Hasil pengukuran berat badan menunjukkan D-galaktosamin menyebabkan penurunan berat badan, tapi sangat mengherankan, temyata bila MBM diberikan satu minggu sebelumnya menyebabkan peningkatan berat badan, mungkin disini karena MBM mengandung multivitamin, yang menyebabkan keinginan untuk makan meningkat. Bile diberikan bersamaan MBM dan D-galaktosamin, temyata menunjukkan bahwa dengan pemberian MBM tersebut, berat badan tidak dapat berubah secara bermakna, kemungkinan ini karena efek dari MBM tidak dapat menetralisir efek dari D-galaktosamin. Efek MBM sendiri secara statistik tidak dapat meningkatkan berat badan.

Pada pemeriksaan histopatologi, hasil yang didapat tidak terlalu mencolok enter kelompok. Hal tersebut cukup mendukung hasil pemeriksaan GPT plasma maupun GPT Kati,, walaupun terjadi perubahan secara biokimia dan fisiologi, tapi mungkin belum mengakibatkan kerusakan organik yang bermakna secara histopatologi. Kerusakan anatomi akan didapat bila zat yang dipakai berlebihan dalam jangka yang lama.

Kesimpulan
Minyak buah merah tidak mempunyai efek protektif terhadap D-galaktosamin.
<hr>
Backgroud
Red fruit (Pandanus conoideus Lam) oil is an antioxidant supplement which has been reported to contain complete nutrient compositions, including 13-carotene and a tocopherol.

Objectives
The aim of this study was to investigate the effect of red fruit oil on rat livers injured by D-galactosamine.

Methods

This study was conducted on 2-3 months old male rats of Sprague-Dawley strain, each weighing about 120-150 grams. We used randomized samples. We divided the rats into five groups, each group consisted of six rats. Each group received a different treatment for four weeks. Group I (control) only received water; group 2 received red fruit oil. Group 3 received D-galactosamine . Group 4 received red fruit oil for one week earlier and then , continued with D-galactosamine. Group 5 received red fruit oil along with D-galactosamine. The red fruit oil supplement was given orally 1 ml/ kg BW/day for 4 weeks.D-galactosamine was given intraperitonealy 200 mglkg BWl week. Every week blood samples were obtained to measure the plasma MDA and plasma GPT levels. After four weeks, blood samples and liver tissues were obtained to measure the plasma MDA, liver MDA, plasma GPT, liver GPT, body weight, liver weight and histopathological feature of liver were determined as parameters. The obtained values were analyzed using parametric test 1 way Anova and continued with post Turkey hoc test. The data results with normal distribution were compared every week, then parametric tests 2 way Anova was conduted and continued with test of Bonferroni multiple comparisons. The data which were analyzed by Kruskal Wallis and Tamhane test showed that the distribution was normal. The values obtained by scale reading, were analyzed using crosstabulation method and continued with test of Chi-Square.

Results

The measurement of plasma MDA every week after treatment with D-galactosamine showed an increase of plasma MDA. This result showed that D-galactosamine causes oxidative damage to lipid molecule since in early perception at first week . The protective effect of MBM to D-galactosamine was seen at the first week. This effect was presumably caused by the antioxidative effects of MBM which neutralized the oxidative stress induced by D-galactosamine . Also, it was possible that the peak toxic effect of D-galactosamine had not appeared during the first week of the study. The plasma MDA level of group 4 dan 5 were higher than that of group 3, possibly because oxidative stress generated by MBM + D-galactosamine was higher than the D-galactosamine itself.

The examination of the tissue liver MDA, statistically showed that D-galactosamine caused oxidative damage. MBM alone also caused oxidative stress, so when it was co-administered with higher D-galactosamine the result was higher plasma level of MDA compared to D-galactosamine alone. The result from the tissue liver MDA indicated that MBM did not provide protection effect to the liver, because MBM caused lipid peroxidation.

Examination of plasma GPT suggested that D-galactosamine had damaging effect to the liver. The same results could also be seen at the second week. When D-galactosamine was given at the same time with MBM, the result of plasma GPT was even higher. The increase of plasma level MDA showed that MBM had potential damaging effect to liver cells. Examination of GPT liver tissue also showed that D-galactosamine caused liver tissue damage and MBM alone could also damage the structure of the liver. Futhermore, when MBM was given one week longer, the damage was even higher.

D-galactosamine increased liver weight significantly. It suggesed that D-galactosamine might cause damage of the liver. Similarly to MBM alone increased liver weight. It could be concluded that MBM was not protective to the liver cell.

D-galactosamine caused weight loss. However, surprisingly enough, when MBM was given one week before, it increased of body weight. This was possible because MBM contains multivitamine that increased the appetite. But when MBM and D-galactosamine were given at the same time, the body weight did not change significantly. It could happen because MBM did not neutralize the effect of D-galactosamine. Statistically, MBM alone coud not increase the body weight.

The result of histopathologic examination showed insignificant difference between groups. This result supported the examination of plasma GPT and also liver GPT. Even though there were biochemical and physiological changes, histopathologically there was no organ damage. Histopatological damage would be found when the substance was used in the long term period.

Conclusion

These results suggested that red fruit oil did not have protective effect D-galactosamine.