Effects of honey as body defense from toxoplasma gondii infection

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Background
Toxoplasma gondii infection may cause liver arrangement and on the other hand honey has an ability in repairing damage of liver tissue due to disease process. This recent study has been made to find out the influence of honey to overcome the histopathological changes of liver caused by toxoplasma

Objectives
There is no report regarding the benefits of honey against T. gondii infection regarding histopathological changes in mice liver, thereby it is necessary to conduct a research on honey administration effect on histological image of mice in the form of necrosis, degeneration and cellular infiltration due to T.gondii infection, and it is thought that honey might be a preventive ingredient to treat T.gondii infection

Methods
Twenty five male mice of 2-3 month old were divided into five groups id est P0, P1, P3 and P4. P0 as a control group was administered with 0.2 ml normal saline solution intraperitoneally, while the P1, with 0.08 ml dorsata honey orally. P2, P3 and P4 were infected with 1x10^3 of T. gondii intraperitoneally. Before this treatment, P3 and P4 were given dorsata honey 0.08 ml and 0.12 ml respectively. Four days post infection all of mice were sacrificed and the liver were subjected for microscopic examination with H&E staining.

Results

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Liver damage</th>
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<tbody>
<tr>
<td>P0</td>
<td>0.450 ± 0.088</td>
</tr>
<tr>
<td>P1</td>
<td>0.460 ± 0.094</td>
</tr>
<tr>
<td>P2</td>
<td>1.050 ± 0.237</td>
</tr>
<tr>
<td>P3</td>
<td>1.460 ± 0.163</td>
</tr>
<tr>
<td>P4</td>
<td>0.780 ± 0.124</td>
</tr>
</tbody>
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Note: Different superscripts in the same column represents significant differences (p<0.05).

Changes in histopathological features that occurred in P0 group was due to several factors. When P0 group was compared to P1 and P4 group, the histopathological features of P0 group was not significantly different with P1 group (given with 0.08 ml dose of honey). This was because the dose used in this study was only 0.08ml and the duration of administration was only 14 days, whereas according to the results of a study by Ji et al, (2011), the dose and duration of honey administration can determine the final outcome of histopathological changes in the mice liver. In their study, Ji et al used a dose of honey which reached 20% of the body weight of the rats, approximately 170-200 grams, for 8 weeks. This caused changes in hepatocytes, where pyknosis and karyorrhexis occurs. Histopathological examination of the entire field of view from P2 group showed necrosis and degeneration in all treatments infected with T. gondii tachyzoite.

Conclusion
Flavonoids in honey are able to act as immunomodulators and antioxidants, therefore both compounds are able to protect the liver or act as hepatoprotector, which is why the results of histopathological features in P4 group who was given 0.12 ml of honey showed reduce liver damage due to T. gondii infection. Based on this study, it can be concluded that giving honey has been shown to reduce the level of liver damage in the form of degeneration, necrosis and inflammatory cell infiltration at a dose of 0.12 ml.

References