Animal Model of Liver Cancer in Mice Induced with N-Nitrosodiethylamine

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INTRODUCTION

Cancer is the world's leading health problem and the second leading cause of death. During the development of cancer research, animal models were very useful and often used in it. Inducing N-Nitrosodiethylamine (NDEA) has been reportedly able to induce hepatocellular carcinoma in mice by causing instability of DNA through the presence of pro-mutagenic products. This study aimed to evaluate the liver cancer model of mice induced with hepatocarcinogenic NDEA.

Material and Method

The BALB/c mice were induced with NDEA 25mg/kg once a week for five weeks intraperitonially and it was evaluated for body weight during study periods. The mice were then sacrificed and excised for evaluating their organs including physical and morphological appearances.

Results

Significant decrease of body weight of mice induce NDEA

![Graph showing body weight changes over time for induced and normal NDEA mice.](image)

Different weight of mice organs

<table>
<thead>
<tr>
<th>Organs</th>
<th>Organs weight</th>
<th>Induced NDEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart</td>
<td>0.10 ± 0.03 g</td>
<td>0.09 ± 0.03 g</td>
</tr>
<tr>
<td>Lung</td>
<td>0.21 ± 0.09 g</td>
<td>0.29 ± 0.09 g</td>
</tr>
<tr>
<td>Liver</td>
<td>1.77 ± 0.34 g</td>
<td>1.09 ± 0.34 g</td>
</tr>
<tr>
<td>Spleen</td>
<td>0.44 ± 0.11 g</td>
<td>0.23 ± 0.11 g</td>
</tr>
<tr>
<td>Kidney</td>
<td>0.35 ± 0.07 g</td>
<td>0.29 ± 0.07 g</td>
</tr>
</tbody>
</table>

These results might indicate severe hepatocellular injury.

Discussion

Inducing NDEA 25mg/kg showed a significant decrease in body weight of mice, it is associated with cachexia syndrome. Cachexia caused by cancer is the result of increased toxicity [1]. One of damaging effects is progressive weight loss as results in depletion of adipose tissue and skeletal muscle [2].

Morphological appearance in mice induced NDEA showed the difference morphological appearance which was characterized by a reduction in size, discoloration, bleeding, scarring, and formation of nodule-like structures. This is because NDEA is a toxic agent against the liver that can cause liver fibrosis [3].

There was a decrease in liver weight. Inducing NDEA causes liver degeneration. Liver weight loss generally reflects loss of function associated with atrophy or lethal hepatocellular injury [4]. NDEA is also able to induce tumors in various organs such as the lungs, liver, esophagus, kidneys, stomach, intestines, and nervous system [5].

Conclusion

It can be concluded that inducing mice with NDEA intraperitonially resulted in liver cancer progress.

References


