THE STUDY OF TOXIC EFFECTS OF
Terminalia chebula Retz. IN MICE

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Terminalia chebula (T. chebula) is a plant of the family Combretaceae which is widely used as a laxative and tonic. At present, a decoction from dried fruits has been promoted as a fruit juice. Therefore, more information from toxicological studies is very essential for evaluating its safety. This study aims to evaluate the toxic effects of T. chebula in mice using both powder and water extracts of the fruits.

Both male and female mice were orally administered a powder of dried fruits of T. chebula at doses 0.5, 2.5, and 5.0 g/kgBW, 5 days per week for 13 weeks. There were no adverse effects on body weight, blood biochemistry (blood glucose levels and serum cholesterol levels), hematologic parameters (% hematocrit and differential leukocyte count), relative organ weight, and histology of liver, kidney, spleen and thymus. In a separate study, both male and female mice were orally administered a water extract of dried fruits of T. chebula at doses 0.2, 1.0, and 5.0 g/kgBW, 7 days per week for 13 weeks. Body weight, blood biochemistry (blood glucose level, plasma glutamic oxaloacetate transaminase (PGOT) and plasma glutamic pyruvic transaminase (PGPT) activities, and blood urea nitrogen levels), hematologic parameters (total red blood cell count, % hematocrit, hemoglobin concentration, mean corpuscular volume, total white blood cell count, differential leukocyte count; lymphocytes, monocytes, granulocytes), relative organ weight, and histology of liver, kidney, spleen and thymus have been recorded and used as indices for evaluating the adverse effects. It was found that the water extract of T. chebula did not cause any obvious adverse effects on body weight, blood biochemistry, hematologic parameters, relative organ weight, and histology of selected organs in both male and female mice. The blood glucose level was increased in the male mice treated with a high dose (5.0 g/kgBW) for 13 weeks. However, the alteration of blood glucose levels observed in this study was within a normal range. Conversely, the amount of total white blood cells seemed to decrease during Week 4 and 8 in the medium and high dose of T. chebula treated groups. An increased thymus weight was detected in male mice treated with 5.0 g/kgBW for 4 weeks. In contrast, a decreased thymus weight was observed in the low dose (0.2 g/kgBW) T. chebula treated male mice (those treated for 8 weeks). Histological study revealed that there was fusion of adjacent splenic nodules in the high dose T. chebula treated male mice and splenic nodule hyperplasia with enlargement of germinal centers in the high dose T. chebula treated female mice. A forty percent death rate was found for male mice treated with a high dose during the 6th to 8th week. However, the possible causes of death are still unclear.

The high dose (5.0 g/kgBW) of T. chebula water extract used in this study was 25-fold higher than the amount present in one bottle of T. chebula juice, which is equivalent to 0.2 g/kgBW. Therefore, the adverse effects of the water extract of T. chebula should not be observed following the traditional oral administration of T. chebula decoction. However precautions should be taken for the long term use of high doses of this plant. Further study should be performed to elucidate the mechanisms of the adverse effects of this medicinal plant on the spleen.
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