THE SIDE EFFECTS OF KACIP FATIMAH EXTRACT ON LIVER AND KIDNEY OF WHITE RATS

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Abstract In Malaysia, most traditional practitioner would recommend Kacip fatimah (Labisia pumila) for the treatment of flatulent, dysentery and post-partum herbs. Although some herbs contain hazardous compound that might be harmful to the host system, Kacip Fatimah is known to be safe for human consumption. This study was conducted to determine the side effects of petroleum-ether extract of Labisia pumila var. alata on liver and kidney of white rats. Thirty-six female Albino Winstar rats were equally divided into four groups. Group A was set as the control untreated group, while Group B, C and D were subjected to subcutaneous injection of the extract at 0.1 mg/ml, 0.05 mg/ml and 0.025 mg/ml respectively. Three animals from each group were euthanized at days 1, 3 and 7 post-treatment. Samples of liver and kidney were collected and fixed in 10% buffered formalin overnight before being processed for histology. Liver impairment was indicated by the development of hydropic degeneration in sinusoid area as early as day 1 post treatment. The lesion progress more severe on day 3 and 7. Inflammatory of the renal tubules were also observed during the development of lesion in the liver. Glomerulonephritis and nephrosis of the kidney were observed until day 7. This abnormality in the liver and kidney tissue suggested the presence of toxin compound from Kacip Fatimah.

KEYWORDS: Labisia pumila var. alata, white rats, liver, kidney, side effects

Introduction

Kacip Fatimah (Labisia pumila) has been widely used by the traditional practitioners as the remedial for involution of birth channel, delay fertility and to regain body strength (Zakaria and Mohd, 1994). Kacip Fatimah is also used to reduce excessive gas in the body, treat flatulence, dysentery, dysmenorrhea, gonorrhea and “sickness in the bones” (Burkill, 1935). Apart from those, the extract from the plant is also used as a drink to gain energy and medicinal usage. Unfortunately the scientific data to support the claims are still scarce. There is no available international publications regarding this plant is effect in human reproduction (Norhayati et al., 1995). Although Kacip Fatimah is generally assumed as safe and sound for human consumption, this study is carried out to determine the side effects of petroleum-ether extract of Labisia pumila var. alata on liver and kidney of white rats by histological examination.
Material and methods

*Labisia pumila* var. *alata* (Kacip Fatimah) samples were freshly collected from Setiu Reserve Forest in Terengganu. The roots of were separated and dried before grinding into fine powder. The powder were then soaked into the petroleum-ether for three consecutive days at room temperature for extraction. The process was repeated twice before the whole extract containing the solvent was collected, filtered and evaporated to dryness under reduces pressure in a rotary evaporator at 40°C. Concentrated extracts of the roots were place in glass container for future use.

Thirty-six female Albino Wistar rats were equally divided into four groups; Group A was used as untreated group, while Group B was treated with 100% (0.1 mg/ml) of *Labisia pumila* pet-ether extract dilute inside 1ml solvent. Group C and D were treated with 50% (0.05 mg/ml) and 25% (0.025 mg/ml) of *Labisia pumila* pet-ether extract dilution inside 1 mL solvent. Rats in Group B, C and D were given subcutaneous injection by using 23-gauge needle and euthanized at days 1, 3 and 7 post-partum. Liver and kidney samples were collected and fixed in 10% buffered formalin for histology preparation. Histopathological changes were examined by using research compound microscope with computerized Image Analyzer Software (Leica DM LB2-Image analyser) to determine the lesions in those organs.

Results

Liver

Histology examination of the liver and kidney of rats in Group A showed no abnormal changes from day 1 until day 7. On contrary, abnormalities were observed in Group B, C and D. Hydropic degeneration of the liver progress severely from day 1 to day 3 and continuously progress until the last day of experiment that is on day 7. Other abnormalities observed in the liver were hyaline degeneration, fatty changes and necrosis of the hepatocytes.

Kidney

No significant changes were observed in the kidney of rats in Group A at day 1, 3 and 7. However, rats in Group B, C and D showed mild to moderate hemorrhage lesions in their kidneys. Inflammation was observed in the cells tubule and progressed to more severe condition at day 7. The lesions were more severe when red blood cells were observed outside the blood vessels almost every part of the kidney tubule.

Results showed that the extract of Kacip Fatimah contains one or more active compound that may injure and caused irritation to the liver and kidney tissues. This irritant toxic compounds produce cellular damage either morphologically or biochemically (Donovan, 1985).

Discussion

The development of lesions in the liver and kidneys of rats suggested that Kacip Fatimah could be poisonous and hazardous if it is consumed in large quantity in a short period of interval. As the second largest organ and gland in the body, liver is recognized as the most important organ for excretion of drugs or other metabolites. It performs many functions, such as transferring and accumulating metabolites, aiding food digestion, controlling the production, storage of glucose and producing blood-clotting factors. The most vital function of the liver is to neutralize and eliminates toxic substances from the body (Runnells et al., 1995). Some of the available chemotherapy drugs are toxic and have the potential to cause liver damage. Liver will remove toxins and chemicals from the blood stream and changes them into products that can be readily removed through the bile or
urine through the kidney. If toxins accumulate in the body faster than the liver can process them, then liver damage will result.

The development of the lesions in the liver highly suggested that Kacip Fatimah extract contains toxin material that is harmful to the liver filtering system. Early evidence of liver damage is usually manifested by the fatty change which is indicated by the form of cytoplasmic vacuoles in the liver cells. The vacuoles will displace the nucleus to one side. When the metabolic disruption is becoming more severe, hydropic degeneration will be noticed and cells will become swollen. Unless the restoration of the normal functions is in place, the liver function will be impaired. Eventually, the affected cells will undergo necrosis or die.

Kidney is the second target in the body after the liver. The main functions of the kidney are the excretion of the by-products of the metabolism, foreign substances such as body pigments (Runnells et al., 1965) and maintaining homeostasis. Exposure to circulating toxins will lead to pathological changes and disruption of glomerular functions. Subsequently, the renal tubular functions will also be affected. The results showed varying degree of irritation to the glomerulus and tubular structures, indicating harmful metabolic activity.

Phytotoxins are also potential to cause glomerulonephritis and nephrosis. This study highly suggested the presence of toxin compound in Kacip Fatimah extract which will cause lesions in liver and kidney in the model animal.

Observation showed that petroleum-ether extract of Kacip Fatimah can caused lesion in the endothelium and tissue of kidney and liver. The most severe lesion occurred in Group B which was treated with high dose (100%) 0.1 mg/ml. Group C had moderate lesion whereas Group D showed mild lesion. Future study needs to carry out to eliminate the presence of harmful compound in Kacip Fatimah for the safety and soundness of the herb.

Figure 1. Group A: Normal hepatocytes (x20)

Figure 2. Group B: Central vein (x20) Day 1
Note the hyaline degeneration of the vein
Figure 3. Group B: Central vein (x20) Day 3
Note the changes in the nucleus of the cells

Figure 4. Group B: Central vein (x20) Day 7
Note fatty change of the liver

Figure 5. Group C: Central vein (x20) Day 1
Note the hyaline degeneration

Figure 6. Group C: Central vein (x20) Day 3
Nucleus is pushed to the peripheral area

Figure 7. Group C: Central vein (x20) Day 7
Note slight fatty change and hyaline degeneration

Figure 8. Group D: Central vein (x20) Day 1
Peripheral area
Figure 9. Group D: Central vein (x20) Day 3
Note that the lesion progressed with time

Figure 10. Group D: Central vein (x20) Day 7
more hyaline degeneration observed and fatty change

Figure 11. Normal kidney Group A (x20)
Note the normal glomerulus in the kidney

Figure 12. Group B: Lesion kidney (x20) Day 1
Note degenerative changes in the tubules

Figure 13. Group B: Lesion kidney (x20)
Day 3 Note mild haemorrhage of glomerulus

Figure 14. Group B: Lesion kidney (x20) Day 7
Note presence of fibrinous exudates in tubules.
Figure 15. Group C: Lesion kidney (x20) Day 1
Hyaline degeneration in the tubules.

Figure 16. Group C: Lesion kidney (x20) Day 3
Swollen of the cells lining the tubules.

Figure 17. Group C: Lesion kidney (x20) Day 7
Swollen of the cells, haemorrhage of the glomerulus and hyaline degeneration

Figure 18. Group D: Lesion kidney (x20) Day 1
Note generalized swollen of the cells lining the tubules

Figure 19. Group D: Lesion kidney (x20) Day 3
Note swelling of the tubule cells

Figure 20. Group D: Lesion kidney (x20) Day 7
Note degenerative changes of tubules, fibrinous exudates and swelling of epithelial cell linings
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