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Toxicological assessment of pyrethrum based mosquito coil smoke on rats

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The study was carried out to investigate the effect of pyrethrum based mosquito coil smoke on the biochemistry and histomorphology of the Wister albino rats. The experiment involved two groups of rats (experimental group and control group, n=10), weighing between 150 to 200g. Before exposure to pyrethrum coil, blood samples were collected from the femoral vein. After that the experimental rats were exposed to the smoke of pyrethrum for a continuous duration 8 hours daily in 27 m³ (3x3x3) well ventilated room for 10 weeks. Thereafter, the blood samples were taken through cardiac puncture and comparison was made with those in the control group. Apart from that different organs were collected after intracardial perfusion technique under Ketamine (80 mg/kg) and Diazepam (2.5 mg/kg) using 10% phosphate buffer formalin. The smoke from the coils induce significant increase (p<0.05) in the levels of WBC, RBC, Hb and significant decrease (p<0.05) in platelets, Blood Urea Nitrogen (BUN) and total protein in biochemical study. The elevated levels of hepatic enzymes were found in the serum of the rats exposed to smoke. This indicated that the enzymes were released from the damaged tissues into the bloodstream. Similarly, smoke induced histopathological changes, including inflammation of the tracheal epithelium, congestion of lung parenchyma with foci of pneumonia. Likewise, dilatation of sinusoids, pericentral vein and periportal tract inflammation and necrosis of hepatocytes were observed. In kidney patchy perivascular and interstitial inflammatory cells were seen whereas glomeruli and tubules appeared unremarkable. In conclusion, prolonged exposure to pyrethrum coil and mat can lead to deleterious effect on health affecting mainly pulmonary, liver and kidney functions apart from allergic reactions and risk of pyrethroid poisoning.

Biography

Subash Sapkota has obtained his MSc Human Anatomy (Medical) from Kathmandu University in 2015. He has worked as a Lecturer in Kathmandu University and is currently working in Gandaki Medical College. He is continuously involved in animal experiment and has potential in research field.

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