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Therapeutic management of lantana associated hepatic and renal toxicity in a bullock: A case report

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Abstract
Lantana is a shrub once grown as garden ornamental plant and is now a major weed across the world. A bullock of approximately 10 years age has brought to the Teaching Veterinary Clinical Complex, College of Veterinary Science, Korutla with the history of anorexia, extensive skin lesions and voiding scanty faeces since two days. According to the history of the owner has escaped and entered into another village and was found grazing on lantana plants. Owner has bought the plant to the clinic to show. On clinical examination it was evident that the bull was lean, dull, depressed with severely sunken eyeballs indicating severe dehydration and extensive red coloured peeled skin lesions of photosensitization in all the sun exposed areas. Dung, urine, blood and serum samples were analysed for the abnormalities. Biochemical analysis revealed very high levels of liver and kidney enzyme. Based on history, clinical signs and biochemical parameters, it was diagnosed to be a case of Lantana poisoning. The bull was treated with supportive therapy and provided proper care and management for recovery. After five days of therapy there was significant improvement in the condition with symptoms receding. Animal gradually returning to normalcy and became normal by day twenty indicating proper and timely supportive treatment is effective in ameliorating signs of Lantana poisoning.

Keywords: Lantana poisoning, hepatic toxicity, renal toxicity, photosensitization and supportive therapy

Introduction
Lantana camara is one of the notorious weeds causing dramatic and apparently irreversible degradation of natural communities in India [1]. *Lantana camara* is a shrub once grown as garden ornamental plant and is now a major weed across the world. Lantana is a highly branched, thick shrub with a height of around 2 - 4 m (Fig. 1). It has vibrant flowers that vary in colour from red-yellow, orange-pink and white depending on the location and plant maturity and all variants are thought to be toxic. But the red-flowered forms are most toxic to livestock. Toxic principles are Lantadine A, B, C, D (Triterpanoid) which effect bile canaliculi. Cattle, sheep, goats and camels are mostly affected. Most cases of lantana poisoning occur when animals are introduced to an area where toxic forms of lantana grows or during droughts when other feed sources are scarce.

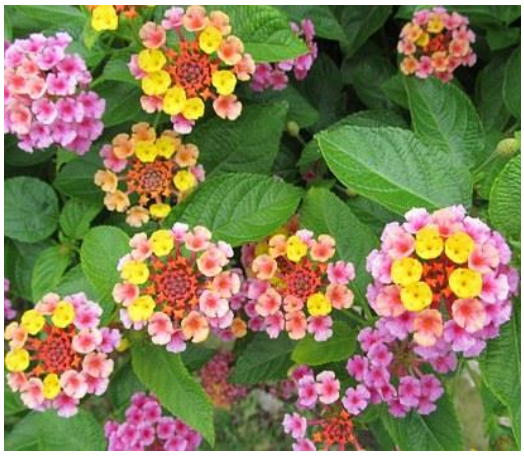

Fig 1: *Lantana camara* leaves and flowers

Lantana camara is one of the most prevalent and noxious weeds, causing hepatotoxicity in grazing animals [2]. This has been shown to cause injury to the bile canalicular membranes, with subsequent cholestasis and hepatocellular damage [3]. The toxic effects of this plant are evident both in ruminants and in non-ruminants and his toxin has been found to be absorbed through entire GIT (gastrointestinal tract), mainly small intestine [4]. It affects the liver and kidneys of ruminants and leads to photosensitization. Following ingestion of the toxins, animals usually die within 2 to 4 days in acute cases manifesting signs of weakness, sluggishness, bloody diarrhea, edematous ears and eyelids, cracks and fissures on muzzle and other non-hairy parts, conjunctivitis, ulceration of the tip and under surface of the tongue, pale conjunctival, vulvar or vaginal mucous membranes and sclera of eye. The toxicity of *Lantana camara* poisoning is mostly ascribed to its absorptive capacity, underpinned by its resemblance to cholesterol, the absorption of which is known to be facilitated by esterification with cholesterol esterase. The bile canaliculicular membranes are the primary site of lantana toxins. The intrahepatic cholestasis in lantana poisoning causes photosensitization due to retention of phylloerythrin which is normally secreted in bile [5].

History and Clinical Examination

A bullock of approximately 10 years age has brought to the Teaching Veterinary Clinical Complex, College of Veterinary Science, Korutla with the history of anorexia, extensive skin lesions and voiding scanty faeces since two days. Owner has reported that three days before, unknowingly his bullock had entered into neighbour village was there for one entire day. Next day owner found the bull grazing on lantana plants. From that day onwards the bull was off fed and voiding scanty faeces and was treated with the rumentorics and B-complex injections at nearby hospital for two days and there was no improvement. Detailed clinical examination revealed the temperature 102 ^{0}F, pulse 84/ minute, heart rate 47 beats/ minute, respiration rate 37/ minute and complete atony of the rumen. Bull was lean, dull, depressed with icteric conjunctival mucous membranes and severely sunken eyeballs (Fig. 2**)** with more than three seconds of skin tenting time examined above the upper eyelid indicating severe dehydration. Marked extensive red coloured peeled skin lesions of photosensitization in all the sun exposed areas was noticed (Fig. 3).

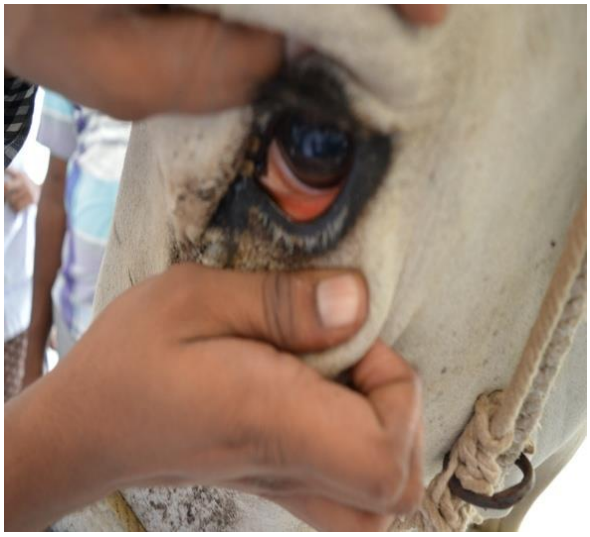

Fig 2: Sunken eyeballs

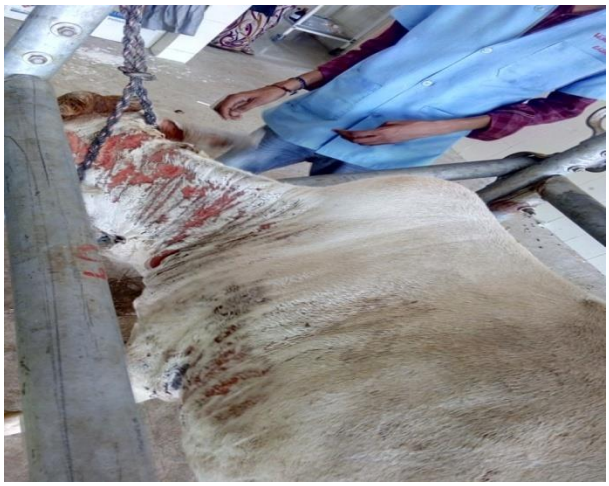

Fig 3: Extensive red coloured peeled skin lesions of photosensitization in all the sun exposed areas.

Samples collected were dung, 1 ml rumen liquor by aspiration with syringe using a large bore long needle, urine and blood (in anti-coagulant tube for complete blood examination and in serum vaccutainers for serum sanalysis) and recorded the observations. Faecal smear was negative for parasitic ova, rumen fluid showed the pH about 8.0 indicating alkaline nature and urine was yellow coloured with slight pungent odour (Fig.4) and is positive for Hay's test indicating presence of bile salts.

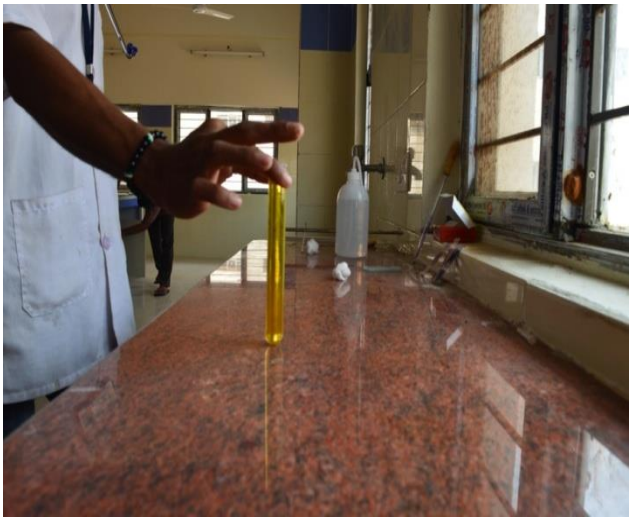

Fig 4: Yellow coloured urine.

Peripheral thin blood smear is negative for haemoprotozoans. Blood analysis revealed decrease in Hb 7 g/dL (Normal 10-15 g/dL), TEC 4.7 $\times 10^6/\mu L$ (5-10 $\times 10^6/\mu L$,) and increase in PCV 52% (Normal 30-45%) and TLC $15\times 10^3/\mu L$ (4-12$\times$ $10^3/\mu L$) indicating dehydration and anaemia. Serum analysis revealed increased concentrations of ALT as 74.3 IU/µL (Normal: 14-38 IU/µL), ALP as 235.3 IU/µL. (Normal: 90-170 IU/µL), BUN values as 41.26 mg (20-30 mg), Serum Creatinine as 4.39 mg% (Normal: 1-2 mg %) and Serum Bilirubin as 0.84 mg% (Normal - 0.1-0.5 mg %) indicating extensive hepatic and renal damage

Treatment and Discussion

Treatment was started by removing the dung per rectally as much as possible and administered 2.5 kg of activated charcoal mixed in 20 liters of water in order to reduce the

further absorption of the toxins. After an hour infused 5% Dextrose @ 1.5 liters intra venously to rehydrate the animal and also administered 50g of 5% magnesium sulphate @ 200 ml orally, as a purgative to expel the ruminal content. Also given Inj. Anistamine 15 ml i.m, once daily to reduce skin allergy, Inj. Toxol 15 ml i.m to support liver, Inj. Meloxicam 15 ml i.m, to reduce the inflammation of skin, Inj. Enrocin 12 ml i.m, to fight secondary infection on first day. Drenched liver tonic Brotone @ 50 ml BID, to counter liver disease and all the skin lesions are cleaned and dressed with Healant anti inflammatory ointment and dispensed Rumentas bolus @ 4 boli daily for 5 days. Further, one more dose of charcoal has given next day and 5% Dextrose, Enrocin, Meloxicam and Anistamine were continued for 5 more days, where as Toxol i.m and oral liver tonic has continued for 20 days. Advised the animal owner to keep bull in the shade at all times to avoid photosensitization and asked to provide fresh water and good feed. Bullock defecated after three days of treatment and started taking green grass from 7th day onwards and was recovered within 20 days although it had mild icteric mucous membranes.

Supportive therapy and preventive measures have proven to be highly effective in the treatment and control of *Lantana camara* poisoning [6]. Oral administration of liver tonics and parenteral administration of vitamin B-complex with liver extracts were suggested in lanatana toxicity cases [4 & 7]. An elevated ALT in the *L. camara* leaf extract treated female mice group [8] and hepatotoxic response in experimental rats fed with Lantana leaf extract [9, 10] are in correlation with the present findings. Lanatana associated renal toxicity was proven in goats fed on Lantana plants [11]. Bentonite was proven to be a low cost alternative to activated charcoal for therapy of lantana poisoning in cattle [2].

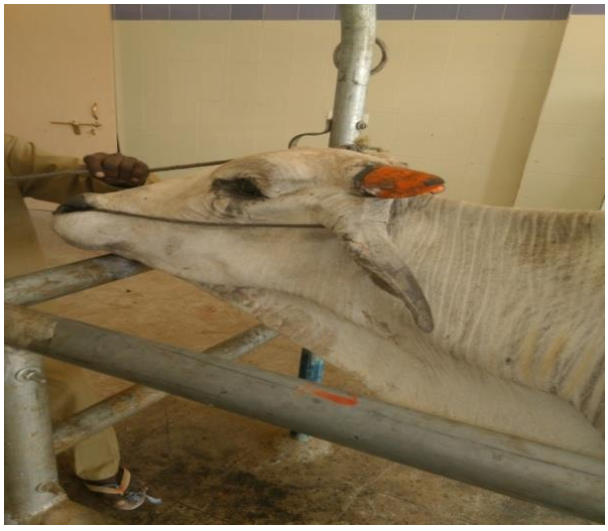

Fig 5: Bullock after 20 days of treatment

Conclusion

From the present clinical case, it is concluded that lantana toxicity can be effectively managed with the timely treatment with the supportive medication to ameliorate the signs of poisoning. Further, lantana affected animals with skin lesions have to be kept in shade along with application of anti-inflammatory ointment. However, prevention is better than cure; hence all precautions should always be taken to prevent intake of Lantana plants by cattle especially during draught periods by providing *ad libitum* feed and water.

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