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Clinical Article

LANTANA POISONING IN SIROHI GOATS IN BOJUNDA, CHITTORGARH

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SUMMARY

Nineteen Sirohi goats with history of *Lantana* ingestion showed anorexia, constipation followed by diarrhoea, icteric mucous membrane and dark coloured urine at Livestock Research Station (LRS) Bojunda, Chittorgarh. Clinical examination revealed alopecia, erythema, oedema and irritation on hairless area and sloughing of epidermis with uneasiness in the Sunlight. Total leukocyte count, total bilirubin, aspartate amino transferase, alanine amino transferase, alkaline phosphatase and gamma-glutamyl transferase were found significantly ($p<0.01$) increased while hemoglobin, red blood cells and packed cell volume were significantly ($p<0.01$) decreased in goats affected with *Lantana* toxicity. Bile salts and pigments were present in urine. Treatment was initiated with broad spectrum antibiotics, NSAIDs, antihistaminic, vitamin B-complex, liver tonic and antiseptic ointments. During treatment, the goats were kept in sheds. On necropsy, liver was found brownish and enlarged and kidneys were pale-yellow in color with glistening appearance.

Keywords: Erythema, Lantana, Oedema, Sirohi goats

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Lantana camara is an exotic ornamental shrub. It is one of the most commonly known noxious and invasive weed worldwide. On the basis of flower's colour, there are red, pink, white, pink edged red and orange varieties. Red flowered varieties are thought to be the most toxic but some white and pink flowered varieties can also be highly toxic (Govindaiah *et al.*, 2021). Animals in pastures with sufficient forage naturally avoid consumption of *Lantana* shrubs due to its pungent aroma and taste. Poisoning mainly occurs when stock unfamiliar with the plant are introduced to areas having *Lantana* weeds and toxicity occurs if animal consumes one per cent or more than its body weight depending on the toxic content (Shafi *et al.*, 2020). The leaves and immature berries of *Lantana* are more toxic to livestock (Haritha *et al.*, 2019). Its toxicity is reported in cattle, buffalo, sheep, goat, camels, horses, dogs, guinea pigs, rabbits, ostriches and rats (Sharma *et al.*, 2007; Kumar *et al.*, 2018; Ambica *et al.*, 2020; Govindaiah *et al.*, 2021). Among ruminants, cattle, buffalo and sheep are highly susceptible, while goats are little resistant (Sharma *et al.*, 2007).

Lantana camara causes toxicity in grazing animals due to presence of active substances i.e. pentacyclic-triterpenoids called Lantadenes. The most important toxic principle of *L. camara* is Lantadene type-A (rehmannic acid). These toxins are absorbed through entire GIT, mainly small intestine. These toxins cause hepatotoxicity, photosensitization and jaundice in grazing animals (Sharma *et al.*, 2007).

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The onset of photosensitization often takes place in 1 to 2 days after consumption of a toxic dose of Lantana. The common signs are generalized weakness, anorexia, constipation followed by diarrhoea, corneal opacity, photosensitization associated dermatitis with alopecia, fissures and sloughing of skin at various parts of body *viz.*, brisket, perianal region, face, nasal area with serum and bloody discharges (Srikanth and Kumar, 2013). Other clinical signs are sluggishness, 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 (if un-pigmented), pale conjunctival, vulvar or vaginal mucous membranes and sclera of eye (Kumar *et al.*, 2016). The animals die within 2-4 days in acute cases and dose dependent mortality was reported in sub-acute poisoning (Parimoo *et al.*, 2015). The present report describes *L. camara* poisoning associated with photosensitive dermatitis in Sirohi goats at Livestock Research Station (LRS), Bojunda (Chittorgarh).

Among 422 Sirohi goats of a herd, 19 Sirohi goats (10 males, 9 females, age = 7-12 months) were presented with signs of anorexia, ruminal stasis, constipation followed by diarrhoea, dehydration, icteric mucous membrane and weakness in hind limbs along with history of grazing since last 4 days on pasture field containing *Lantana* shrubs (Fig. 1). Faecal smears were negative for parasitic infestation while urine samples were dark yellow coloured. Skin scrapings and tape impression smears were negative for mites, bacterial and fungal infection. Temperature, pulse and

Fig. 1. Different varieties of *Lantana* flowers with immature fruit (*berries*) in grazing area.

Fig. 2. Skin lesions at all over body in *Lantana* poisoning in Sirohi goat.

Table 1

Hemato-biochemical values (Mean ± S.E.) in Healthy and *Lantana* poisoning cases of Sirohi goats

S. No.	Parameters	In Healthy case (n=5)	In poisoning case (n=19)
1.	Hemoglobin (g/dl)	10.90 ± 0.241	6.21 ± 0.280**
2.	RBC (x 106/ µl)	13.90 ± 1.126	7.22 ± 0.450**
3.	PCV (%)	34.10 ± 2.548	19.73 ± 1.280**
4.	TLC (103/ µl)	5.17 ± 0.881	14.23 ± 0.980**
5.	Glucose (mg/dl)	55.25 ± 2.55	45.47 ± 1.670
6.	Total protein (g/dl)	6.91 ± 0.358	9.16 ± 1.000**
7.	Total bilirubin (mg/dl)	0.35 ± 0.077	0.68 ± 0.090**
8.	Creatinine (mg/dl)	1.18 ± 0.098	1.26 ± 0.044
9.	BUN (mg/dl)	12.78 ± 0.748	23.28 ± 0.980
10.	AST (IU/L)	25.23 ± 6.259	78.18 ± 1.730**
11.	ALT (IU/L)	34.83 ± 2.765	48.82 ± 3.330**
12.	ALP (IU/L)	148.43 ± 12.69	250.46 ± 10.480**
13.	GGT (IU/L)	28.06 ± 4.037	60.18 ± 4.390**

** = Highly significant at (P<0.01)

respiration rate were in normal range. Affected goats showed discomfort and abnormal behavior in sunlight. Clinical examination also revealed dermal signs as alopecia, erythema, edematous swelling and irritation of hairless area and sloughing of epidermis especially ears, muzzles, neck, shoulder, peri-anal and peri-vulvar regions (Fig. 2).

For haemato-biochemical parameters, blood samples were collected in two test tubes [one with anticoagulant (EDTA @ 1 mg/ ml of blood) and other without anticoagulant for serum separation] from the jugular vein from all diseased goats and five apparently healthy goats. Haematological and biochemical parameters were estimated as per standard techniques (Feldman *et al.*, 2000) and by using Auto-Biochemistry Analyzer Idexx Vet Test (IDEXX Laboratories, Maine, U.S.A.), respectively. Urine samples were analyzed by multi test urine stripes. The data obtained were statistically analyzed by t-Test.

In haemato-biochemical indices, mean value of total leukocyte count (TLC), total protein, total bilirubin, aspartate amino transferase (AST), alanine amino transferase (ALT), alkaline phosphatase (ALP) and gamma-glutamyl transferase (GGT) were found significantly ($p<0.01$) increased while hemoglobin, red blood cells (RBC) and packed cell volume (PCV) were significantly ($p<0.01$) decreased in goats affected with *Lantana* toxicity than healthy control goats (Table 1). Serum glucose, creatinine and blood urea nitrogen (BUN) were altered non-significantly. Bile salts and pigments were also present in urine.

The affected goats were kept in sheds and dark-cool room for protecting from direct Sunlight to avoid photosensitization and to provide adequate fresh water and good feed (Kumar *et al.*, 2016; Ambica *et al.*, 2020). The

animals were not given green fodder during the course of sickness. The management of toxic effect was achieved by oral administration of activated charcoal (universal antidote) @ 5 gm/kg b. wt. and Bovilax powder (purgative) @ 2 gm per kg body weight. For supportive therapy, 20 per cent dextrose was administered along with oxytetracycline hydrochloride long acting (@ 20 mg/ml, broad spectrum antibiotic), meloxicam + paracetamol (NSAIDs), pheniramine maleate (antiallergic @ 1 mg/ml), dexamethasone (corticosteroids), vitamin B-complex, Liv-52 (liver tonic) and *Bol. Ecotas* one daily for 3-5 days. Skin lesions were dressed with potassium permanganate solution (disinfectant) and Himax ointment (herbal antiseptic and antifungal) twice daily for healing the lesions.

In present study, the incidence rate and mortality rate were 4.5 % and 2.13 %, respectively. After treatment, mildly affected ten goats recovered gradually and regained normal gesture and appetite within 5-7 days. However, nine goats died in second week due to severe poisoning or delayed diagnosis. Necropsy of these goats revealed pale mucus membranes, severe icterus, dehydration, constipation and swollen, brown pale yellow, enlarged liver and a distended gall-bladder with dark opaque and viscous contents. The kidneys were found pale, swollen and necrosed along with yellow, glistening appearance. The colon and rectum were impacted with putty-like faeces. Other pulmonary and spleen lesions were moderately diffusely congested.

Reports of naturally occurring *Lantana* poisoning in ruminants are very common in southern Rajasthan (Katewa *et al.*, 2008; Singh, 2018; Tarunpreet and Saganpal, 2021). Lantadene A causes bile canalicular damage, intrahepatic cholestasis and jaundice in cattle, sheep and goat (Chirayath *et al.*, 2017). Carcass in *Lantana* poisoning is characterized by severe icterus (severe yellowish discoloration of tissue), dehydration, constipation (hard, dry mucous-covered faecal masses in large intestine), swollen liver, distension of gall bladder and nephrosis (Sharma *et al.*, 2007; Kachhawaha *et al.*, 2014). The management of toxic effects can be achieved by activated charcoal and supportive therapy along with the provision of dark and cool place but are not much effective in some severely affected or delayed diagnosed cases. Specific antidote for *Lantana* toxicity is still lacking. However, activated charcoal is an effective, quick and economic chemical which adsorbs the toxins in the rumen and prevents further absorption of toxin in body (Gupta *et al.*, 2019; Haritha *et al.*, 2019). The preventive measures are more effective than curative measures in *Lantana* toxicity. Prevention can be done by keeping the farm *Lantana* free (Gupta *et al.*, 2019) and by providing *ad libitum* feed and water to animals before allowing to graze during drought and scarcity periods (Ambica *et al.*, 2020).

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