Therapeutic Efficacy of Nefrotec Liquid Against Renal or Visceral Gout in Broiler Chickens - A Field Report

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INTRODUCTION
The incidence of gout in broiler birds has been speculatively blamed on the high protein levels in diets. Gout in birds can be in two forms, visceral gout and articular gout. Visceral gout is the most common form in poultry, wherein the plasma uric acid levels are high and urates are deposited in the visceral organs. Sillers (1959) suggested that this form of gout is the result of physiological changes in the kidneys, which affect the kidney functions in general. Visceral gout was experimentally induced in chickens by feeding diets deficient in vitamin A (Elvehjem and Neu, 1932), and with diets containing excess calcium (Shane, 1969). Articular gout is characterized by the accumulation of urates in the synovial capsule and tendon sheath of a joint. It has been experimentally produced in chicks genetically prone to this disease, fed with high protein (80%) diets (Peterson et al., 1971). Researchers have demonstrated that the incidence of articular gout is highly influenced by heredity. Both visceral and articular gout in birds are associated with elevated plasma uric acid. However, according to Schlumberger (1969), these two conditions are separate entities and do not occur together. Uric acid is the main end product of nitrogen metabolism in birds, accounting for approximately 80% of the nitrogen excreted (O'Dell et al., 1960). Thus, uric acid content in blood should be influenced by dietary protein, protein quality, protein metabolism and nutritional state.

Several predisposing factors may be involved in urate deposition. These includes:
1) Nutritional causes viz., vitamin-A deficiency, water deprivation, excess of sodium bicarbonate, calcium and protein, poor quality mineral mixture and adulteration of protein supplements with urea;
2) Infectious causes viz., infectious bronchitis virus and avian nephritis virus;
3) Toxic causes viz., antibiotics, mycotoxins, minerals, vitamins, chemicals and pesticides, which can increase uric acid levels in the blood and lead to precipitation in the tissues and impair renal function.

The therapy consists of a combination of dietary, environmental, local and systemic treatments, preferably with eco-friendly herbal formulations possessing antilithic, urinary antiseptic and diuretic activities. NEFROTEC LIQUID* is an herbal formula developed by The Himalaya Drug Company, Bangalore with the above properties. The objective of this field trial was to determine the efficacy of NEFROTEC LIQUID in renal or visceral gout in broiler chicken.

*Each 5 ml of NEFROTEC LIQUID contains:
Extracts of
Crataeva nurvala (Syn. magna) (Varuna),
Tribulus terrestris (Gokshura),
Boerhaavia diffusa (Punarnava),
Hemidesmus indicus (Sariva),
Asparagus racemosus (Shatavari), Trikatu and powder of Kshara parpati.
FLOCK HISTORY
The trial was conducted in a broiler farm near Bangalore with five thousand commercial Cobb broiler chicks, which were procured from a commercial hatchery and maintained at standard husbandry practices. On day 1, the chicks were given only maize grit and from day 2 onwards, they were maintained on chick starter mash. On day 4, there was mortality of 40 chicks (0.8%). On day 5, the mortality increased to 61 chicks (1.24%).

OBSERVATIONS
Observations revealed that the chicks were dull, depressed, huddling at a corner, reluctant to consume feed and water and appeared to be dehydrated. The postmortem examinations of the dead and a few live chicks showed enlarged kidneys and ureters with chalky white crystal impaction. Similar chalky white crystal depositions were also noticed grossly on some of the visceral organs like liver and heart.

DIAGNOSIS
Visceral gout was diagnosed based on the flock history, feed sample analysis (Table), postmortem of the ailing, dead and normal birds. This could be due to water deprivation and high level of calcium in the broiler starter mash.

TREATMENT
The chicks were divided into two groups (i.e. groups 1 and 2). Group 1 was treated with NEFROTEC LIQUID at a dose of 5 ml per 100 chicks in drinking water for 5 days. Group 2 was given electrolytes and liver tonics.

RESULTS AND DISCUSSION:
The mortality rate reduced to 0.44% (22 chicks) and 0.1% (5 chicks) after two days of treatment. On the 3rd day, mortality stopped completely. Normal feed and water consumption was restored after 3 days of treatment in treated group. In Group 2, there was a mortality of 20-25 chicks daily. When Group 2 was treated with NEFROTEC LIQUID, mortality was completely controlled within 3-4 days.

The reduction in the mortality rate in visceral gout, could be attributed to the antilithic and lithotriptic properties of the formulation.

The administration of the ethanolic extract of Tribulus terrestris fruit in rats resulted in varying degrees of reduction in deposition of stone when compared to control animals (Anand et al., 1994). The efficacy of Tribulus terrestris in lowering hyperoxaluria seemed to be mainly mediated through its inhibitory action on glycolic acid oxidase and glycolic acid dehydrogenase, and its enhanced production of glyoxylate (Sangeeta et al., 1994). Crataeva nurvala is used effectively in the management of urolithiasis, prostatic hypertrophy, neurogenic bladder and chronic urinary infections (Prabhakar et al., 1989). The reduction in the urinary and renal tissue oxalate levels, along with the reduced liver glycolic acid oxidase activity brought about by Crataeva nurvala decoction in caliculosis is noteworthy.

| Table: Composition of starter ration |
|---------------|----------------|
| Nutrients      | Starter Ration |
| Crude protein (%) | 19.46          |
| Ether extract (%)   | 2.20           |
| Crude fiber (%)    | 4.20           |
| Nitrogen free extract (%) | 69.12   |
| Ash (%)           | 2.70           |
| Calcium (%)       | 4.80           |
| Phosphorus (%)    | 0.50           |
| Mycotoxin (ppm)   | 0.40           |
(Varalakshmi et al., 1990). In vitro experiments have shown the inhibitory effect of *Crataeva nurvala* on the growth of struvite (magnesium ammonium phosphate) crystals (Paul et al., 1986).

**CONCLUSIONS**
The present field trial indicates that treatment with NEFROTEC LIQUID helps to control visceral or renal gout in birds. The synergistic effect of antilithic, diuretic and urinary antiseptic activity in the ingredients of NEFROTEC LIQUID contributed to the recovery of birds. Hence, NEFROTEC LIQUID can be effectively used to control visceral or renal gout in broilers without any side effects.

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**REFERENCES**


