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A Case Report: Thallium Toxicity in the Dog

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TREATMENT

Many approaches have been tried for the treatment of thallium poisoning. If used within one to two hours after ingestion of the poison, gastric lavage with 1% sodium iodide solution has been shown to be beneficial. Treatment with sodium thiosulfate, BAL or calcium EDTA has been of little benefit. Diphenylthiocarbazine has been used for treatment of thallium poisoning with somewhat more success than other therapeutic agents. Since this compound has resulted in a serious systemic zinc loss, it must be used with utmost caution. Treatment of acute cases with 70 mg. diphenylthiocarbazine/kg body weight three times daily, with 2-6 gms. potassium chloride daily has been suggested as being satisfactory (4). In chronic cases it may be inadvisable to administer such high doses since it may cause the rapid transfer of thallium from the tissues into the blood stream and vital organs resulting in acute thallium toxicity.

SUMMARY

Thallium poisoning in dogs is a disorder which is difficult to diagnose by symptoms

alone. The most characteristic clinical changes observed are injection of the sclera and reddening of oral mucous membranes in acute cases and alopecia and skin changes in chronic cases. The detection of thallium in the urine of suspected cases of poisoning by one of the "quick tests" available has been shown to be one of the best diagnostic aids. A specific, effective antidote for thallium toxicity is lacking, although diphenylthiocarbazine has shown promising results in some cases.

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a case report:

Thallium Toxicity in the Dog

by

Marvin Farley

HISTORY

A two and one-half year old spayed female miniature schnauzer was presented to the university clinic for treatment. The owner reported that the dog had been losing hair for the past four days. No other history was available and the animal had no other observable signs.

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CLINICAL SIGNS

The patient was treated as an inpatient. Large, multiple, focal areas of erythema were noted on the dog's skin. Hair could easily be pulled out of the skin in tufts. Physical examination revealed no other externally detectable clinical signs, although skin sensitivity seemed to increase over a period of five to seven days.

DIFFERENTIAL DIAGNOSIS

The hair loss was suggestive of hormonal disturbances or possibly a thallium toxicity. Cushing's syndrome was among those endocrine disturbances considered but the lesions appeared to be too acute to be typical. A hemogram including a white cell differential revealed normal values—including normal values for the eosinophils and lymphocytes. In Cushing's syndrome these two values in particular are depressed due to the effect of hyperadrenocorticoidism. Furthermore, this condition is found to occur with greater frequency in dogs over five years old.

A urine sample was secured for chemical assay of heavy metals. A rapid qualitative test was positive for thallium and a quantitative test revealed a thallium concentration of 7.68 mg./liter of urine.

TREATMENT

The treatment consisted of daily administration of a therapeutic level of a multiple vitamin preparation. This was given to aid maintenance of integrity of the epidermis until the thallium (unbound) could be excreted. Diphenylthiocarbazon, a chelating agent, was not used in this case because the toxicity was believed to be sub-acute. (Thallium poisoning had been treated with oiphenylthiocarbazon but it has been reported that this treatment is unsatisfactory. As the antidote removed the tissue-bound thallium, the animal exhibited an increased stress, reappearance of acute symptoms and death.)

At the time of discharge from the clinic the patient appeared to be alert and active. Further word on the disposition of the animal was unavailable.

SOURCE OF THALLIUM

The owner was asked to look for a possible source of the poison. He found some bat poison (corn impregnated with thallium) in his attic. An analysis was run on

the corn and it was found to be strongly positive for thallium. It seems reasonable to assume that this was the source of the poison.

SUMMARY

The case was apparently one of marginal toxicity since none of the gastrointestinal signs of diarrhea, vomiting, and abdominal pain were manifested. Also, there was no increased thirst or inappetence. The central nervous system disturbances associated with a chronic thallium toxicity were also absent. The absence of typical symptoms could be attributed to the small amount of thallium impregnated corn ingested by the dog. The treatment was symptomatic; it was hoped that the dog would eliminate the toxin by herself since the dose was presumed to be light.

Editor's note:

On October 25, 1965, a three year old spayed female mixed terrier was presented to the Iowa State University clinic with a history of vomiting, polydipsia, and lethargy. Examination revealed multiple areas of erythematous skin, injection of scleral blood vessels, inflammation of the mucous membranes, dyspnea, turning of the head to one side, and encrustation of the eyes and external nares. The dog was hit by a car three months previous. A radiograph was taken and revealed obstipation and enlargement of the heart. A hemogram revealed a PCV of 51 and a slight leukocytosis. The animal was given 5% dextrose in one-half strength saline as supportive therapy. A urine sample was obtained and a rapid qualitative urine test was strongly positive for thallium. At the time this issue was sent to press, no alopecia areata was present although the hair could be pulled out in tufts at will. At this time the clinician in charge was considering diphenylthiocarbazon therapy for this dog.

—Froehlich