

EXPERIMENTAL LEAD POISONING IN TURKEY VULTURES (*CHATHARTES AURA*)

Introduction

Scientists overseeing this study were evaluating the effects of induced lead poisoning in turkey vultures (*Chathartes aura*). The turkey vultures were given doses of lead over a period of time and the effects (physiological and mortality) were observed.

Lead was induced into the bird's systems through the use of BB sized gun shots containing lead. The BB sized lead shots were chosen due to the potential exposure that the birds could experience in their native habitat (i.e. remaining gun shot from hunting activities).

This research was conducted due to lead poisoning in the environment that has been the documented cause of death of multiple species of waterfowl. Specifically, lead poisoning gained a lot of attention for its impact on the decline of the California condor (*Gymnogyps californianus*). California condors found dead in the 1970's and 1980's were found to have elevated lead levels in their bones and tissues. The turkey vulture was chosen for this study because it is commonly located in the range of the California condor and has had a prior documented history of elevated lead levels.

The scientists presented the hypothesis that elevated lead levels in the environment have had a historical impact on the populations of waterfowl and continue to affect the populations today.

Materials and Methods

Lead exposure effects were tested on eight turkey vultures, captured for this study. The birds were medically tested for the presence of pre-existing biological lead concentrations and were also fed an identical diet prior to the beginning the study.

As the study began, the birds were randomly given one of three pre-weighed lead shots: identified as zero shot, one shot, and three shot. The zero shot contained no lead and was given to two control vultures. The one shot dose was given to three vultures and was designed to achieve a lead concentration of 0.192 grams (g) of lead per kilogram (kg) of body weight. The three shot was designed to obtain 0.576 g of lead per kg of body weight and was given to the remaining birds. A physiological observation of the effects of the lead exposure in the turkey vultures was then conducted.

Two months after the first lead dose the non-control birds were given an additional higher 10 shot dose of lead (equivalent to 1.92g of lead per kg of body weight). The birds remained on the experiment until they either died or were euthanized to terminate the study.

Results

Results of the study showed that the induced lead exposure caused death and/or illness in four of the six non-control birds. Two of the birds died that were dosed with the three shot and two other birds showed extreme illness.

The birds that showed extreme illness were a three shot dosed bird and a lower one shot dosed bird. Additionally, physiological deterioration was observed during necropsy of all exposed birds. Two of the non-control birds showed no physical sign of effect from the lead exposure (through death or illness), prior to being euthanized to terminate the study.

Discussion

Four out of the six dosed turkey vultures showed physical signs of lead poisoning (though death or illness) during the study. Surprisingly, two of the birds showed no physical signs of poisoning throughout the entire study. However, physiological changes were observed

in all of the non-control turkey vultures in the study upon necropsy, indicating a correlated negative response to lead exposures.

The study indicated that survival time for the turkey vultures after continuous lead exposure was found to be longer than prior studies performed on other species of birds. This indicated that the turkey vultures showed a higher tolerance for lead exposure than expected.

The study concluded that though the results of the lead exposure indicate a correlated negative response in the turkey vultures participating in the experiment, their high tolerance made them poor models for accurately studying the physiologic response from lead exposure on the California condor, along with other bird species.