

characteristics of agents in the rhinovirus subgroup of picornaviruses: small size (15-30 m μ), RNA core, ether stability, inactivation at pH 3.0. Both 1505 and 8213 viruses were tested by neutralization tests against 85 previously described rhinovirus serotypes and 11 possible candidate rhinoviruses, and both were found to be distinct antigenically from all ninety-six.

ADDENDUM: Following the completion of this study, the two rhinovirus strains were assigned serotype numbers by the participants in the WHO-NIAID Rhinovirus Collaborative Nomenclature Program. Rhinovirus strain 1505 was designated rhinovirus 48 and rhinovirus strain 8213 was designated rhinovirus 49.

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Comparison of Parenterally and Orally Administered Diethylstilbestrol In Production of Aortic Ruptures in Turkeys.* (31351)

CHARLES F. SIMPSON AND R. H. HARMS

Department of Veterinary Science, University of Florida, Gainesville

Aortic ruptures have been produced in turkeys by diethylstilbestrol (DES) injections. Fatal dissecting aneurysms occurred

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TABLE I. Weight and Mortality from Aortic Ruptures Among Turkeys Fed or Injected with DES (Exp I).

Dose	DES treatments		Wt* (lb)	% aortic rupture	Blood pressure† (mm Hg)
	Form	Route			
0	—	—	8.59 ^a	.0 ^c	236
4 g/100 lb	Powder	Oral	8.74 ^a	.0 ^c	—
8 "	"	"	8.23 ^a	17.3 ^b	—
16 "	"	"	7.56 ^b	33.2 ^a	183
30 mg/wk	Liquid	Parenteral	7.00 ^b	39.0 ^a	174

* At 12 weeks.

† At 11 weeks.

Means with same superscript do not differ significantly according to Duncan Multiple Range Test.

when DES was injected as a pellet(1) or as a liquid(2). However, the effect of feeding DES on production of aortic ruptures has not been determined. This report compares the influence of orally and parenterally administered DES on incidence of aortic ruptures, serum lipids and nitrogen, and systolic blood pressure of turkeys.

Materials and methods. Experiment 1. Broad-Breasted Bronze male turkey poults were raised by conventional poultry husbandry methods as previously reported(2). The turkeys were changed to a 19% protein diet which contained 0.5% NaCl(3) at 4 weeks of age. They were changed at 6 weeks of age to a 23% protein diet containing 3% NaCl and 6% animal fat(3). At this time the turkeys were assigned to groups, each consisting of 6 poults, and treatments were initiated. Eight groups of birds were injected subcutaneously at weekly intervals with 30 mg DES in liquid form(2). The feed of 4 groups of birds was supplemented with 4 g of pure DES powder/100 lb of feed while 12 groups received feed containing 8 g and another 12 groups received feed containing 16 g DES powder/100 lb of feed. Four groups of birds received no medication and served as controls. Indirect systolic blood pressures(5) were recorded at 11 weeks of age. The experiment was terminated when the turkeys were 12 weeks of age, at which time body weights were recorded.

Experiment 2. The management of poults in Exp. 2 was similar to Exp. 1 up to 6 weeks of age when the turkeys were divided into 16 groups, each consisting of 10 birds. Birds were started on the same 23% protein diet fed in Exp. 1 at 6 weeks of age. Eight birds

in each of 4 groups were injected weekly with 30 mg liquid DES, while the remaining 2 turkeys in each group served as controls. Four groups of birds were provided feed containing 16 g of pure DES/100 lb of diet, and another 4 groups were fed the same diet containing 32 g DES powder/100 lb of feed. The remaining 4 groups of turkeys were fed 16 g liquid DES[†]/100 lb of feed. Body weights were recorded at 10 weeks of age, and the experiment terminated when the birds were 12 weeks of age.

Total plasma lipids(4), Kjeldahl assay for plasma nitrogen, and indirect systolic blood pressures(5) were determined at 11 weeks of age.

Results. Exp. 1. Thirty-nine percent of the turkeys injected with 30 mg of DES died of aortic ruptures, and 33% of the poults fed 16 g DES/100 lb of feed died of the disease. Seventeen percent of the turkeys fed 8 g DES powder/100 lb of feed died of angiorrhesis while none died that were fed 4 g DES powder/100 lb of diet (Table I). All treatments with DES caused hyperlipemia, as determined by the appearance of thick, yellow plasma and relative hypotension. The systolic blood pressure of turkeys injected with DES averaged 174 mm Hg at 11 weeks of age, and the systolic blood pressure of poults fed 16 g DES/100 pounds of feed averaged 183 mm Hg at the same age. The systolic blood pressure of control birds was 236 mm Hg at this time.

Weight gains of turkeys were increased by feeding 4 g DES/100 lb of feed, but weight gains were decreased by all other levels of

† Stilbosol, Eli Lilly Co., Greenfield, Ind.

TABLE II. Serum Composition Blood Pressure and Mortality from Aortic Rupture Among Birds Fed or Injected with DES (Exp II).

DES treatments			Wt* (lb)	Total lipid† (mg/100 ml plasma)	Blood pressure† (mm Hg)	% plasma N†	% aortic rupture
Dose	Form	Route					
0	—	—	5.30	609	233	.5	0 ^a
16 g/ 100 lb	Powder	Oral	4.17	14,732	180	—	28 ^b
<i>Idem</i>	Liquid	"	4.89	16,975	178	—	37 ^b
32 g/ 100 lb	Powder	"	4.39	19,250	178	—	21 ^b
30 mg/wk	Liquid	Parenteral	4.57	15,000	173	1.06	32 ^b

* At 10 weeks of age.

† At 11 weeks of age.

Means with same superscript do not differ significantly according to Duncan Multiple Range Test.

DES (Table I).

Exp. 2. Thirty-two percent of the turkeys injected with DES died of aortic ruptures. Twenty-eight percent of the poult fed 16 g of DES powder/100 lb of feed died of aortic rhexis, and 21% of the birds fed 32 g DES powder/100 lb of diet died of the syndrome. Thirty-seven percent of the turkeys fed 16 g liquid DES/100 lb of feed died of aortic ruptures.

Administration of DES in all forms and dosages employed caused hyperlipemia and relative hypotension that did not differ materially with the method of administration or quantity of DES employed (Table II). The percent nitrogen in plasma of control turkeys was substantially lower than that of DES-injected poult (Table II).

Discussion. It was concluded from the results of these experiments that DES was equally active in producing aortic ruptures in turkeys when administered by either the oral or parenteral routes. It is recognized that specific amounts of drug are not received when a drug is administered in the feed. Larger amounts of DES were required by the oral than the parenteral route (30 mg/week) to produce aortic ruptures in turkeys since under our experimental conditions it was found that 6 to 11 weeks old poult consume an average of 2 lb of feed a week, or 320 mg of DES, when fed a diet containing 16 g DES/100 lb of feed. However, the data in Exp. 1 indicated that for oral DES to be effective in the induction of aortic ruptures,

sufficient quantities of the drug had to be fed to cause decreased weight gains. Four grams of DES/100 lb of feed caused increased weight gains which were not significant, but no mortality from aortic ruptures.

The data reported in here indicate that aortic ruptures resulted from the action of DES and not from the excitement that accompanied injections, since comparable mortality ensued when the drug was given by either the oral or parenteral routes. Similar hypotension and hyperlipemia occurred in both situations.

Summary. The incidence of aortic ruptures in turkeys was similar when DES was administered either by the oral (16 and 32 g/100 lb of feed) or parenteral (30 mg/week) routes. Comparable hyperlipemia and lowering of blood pressure occurred in both treatment methods.

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