Technical Papers

The Effect of Environmental Temperature on Cortisone Toxicity for Mice[1]

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In the course of a study now being conducted on the effect of cortisone and other compounds on mice systemically infected with *Candida albicans,* it became apparent that the mortality rates of control animals varied with the season of the year. It was therefore felt pertinent to ascertain what effect different environmental temperatures had on infected mice and on uninfected, treated controls; this report concerns itself with the latter.

Groups of 10 Swiss mice (departmental stock), 18–22 g, were placed at incubation temperatures of 35° to 37° C, 25° to 29° C, and −5° to 7° C. Half of these animals were inoculated intramuscularly with 0.5 mg (0.1 ml) of cortisone acetate (Merck)[2] every 48 hr

TABLE 1

SURVIVAL OF MICE INOCULATED WITH 0.5 MG OF CORTISONE ACETATE EVERY 48 HR AND INCUBATED AT VARIOUS TEMPERATURES

Temp (°C)	Sex	No. surviving								
		1	2	3	4	5	6	7	8	Days
35°–37°	M	10	10	10	8	7	7	5	3	
25°–29°	M	10	10	10	9	6	6	6	6	
−5°– 7°	M	10	10	10	10	10	10	10	10	
35°–37°	F	10	10	10	9	9	9	8	7	
25°–29°	F	10	10	10	10	9	9	9	9	
−5°– 7°	F	10	10	10	10	10	10	10	10	
Controls, untreated										
35°–37°	M	10	10	10	10	10	10	10	10	
25°–29°	M	10	10	10	10	10	10	10	10	
−5°– 7°	M	10	10	0	0	0	0	0	0	
35°–37°	F	10	10	10	10	10	10	10	10	
25°–29°	F	10	10	10	10	10	10	10	10	
−5°– 7°	F	10	10	0	0	0	0	0	0	

for 8 days, initiating this treatment on the first day. Untreated animals were maintained as controls. Table 1 records the numbers of survivors in all groups of mice studied.

From these data one may infer the following:

1. The toxic effects of cortisone were enhanced by an increased environmental temperature (35° to 37° C).

2. This enhanced toxicity was more manifest in male mice. This was evident at the 35° to 37° C and 25° to 29° C temperature ranges. This effect was also reported by Ingle (*1*) for male and female rats inoculated with "cortin."

3. A cold temperature (−5° to 7° C) eliminated the toxic effects of the cortisone manifest at higher environmental temperatures.

4. This dosage of cortisone eliminated the deleterious effects of the cold. Thus, all treated mice, male and female, survived the 8-day incubation period, whereas all the controls were dead by the second day.

This work was repeated with essentially the same results.

These experiments lack the refinement of humidity control and maintenance of a constant oxygen tension in the incubators, which may be significant in modifying the mortality rates of the mice. The work should be repeated by those having access to temperature- and humidity-controlled cabinets that are also air-circulated.

Numerous workers who have been studying the effects of cortisone on infected animals determine the toxic levels for cortisone for a certain schedule and use this standard for all future experiments without repeating this control portion of the work. It is our contention that controls of uninfected, treated groups of animals are required for *each* experiment. The alternative is to perform such experiments under conditions where temperature, humidity, and air circulation can be controlled.

It is also conceivable that these temperature effects might be significant in the clinical use of cortisone. It is not known to this author that such applications have been made.

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[2] The generosity of Merck & Co. in supplying cortisone acetate is gratefully acknowledged.

Reference

1. INGLE, D. J. *Endocrinology,* **24**, 194 (1939).

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Adsorption of Serum Lipids by Montmorillonite

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The fact that soils high in clay retain much greater amounts of organic matter than those low in clay has led to several investigations dealing with the adsorption capacity of clays. Among them montmorillonite is very effective because of its high ion exchange and swelling capacities. Thus montmorillonite adsorbs large protein molecules, such as albumin, gelatin, hemoglobin

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