

STUDY OF THE VIRULENCE AND TOXICITY OF ENTEROPATHOGENIC STRAINS OF *Escherichia coli* ON ADRENALECTOMIZED ANIMALS

R. T. Krivonosova

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An earlier investigation [2] showed that adrenalectomy causes a sharp increase in the sensitivity of albino mice to the toxic action of living and killed cultures of enteropathogenic strain O₅₅:B₅ of *Escherichia coli*. In certain conditions a decrease in the resistance of adrenalectomized animals to infection caused by this microorganism could also be observed.

It has been found [1] that adrenalectomy causes a sharp increase in the sensitivity of mice to the residual toxic substances present in phagolyzates of pathogenic strains of *E. coli*.

One of the objects of the present investigation was to study whether adrenalectomized animals are suitable for comparing the virulence of different enteropathogenic strains of *E. coli*. In addition, the optimal times of titration of the residual toxicity of phagolyzates of enteropathogenic strains of *E. coli* were investigated and the sensitivity of animals of different ages to these preparations was compared.

EXPERIMENTAL METHOD

Experiments were carried out on albino mice aged 1.5-2 months, weighing 16-18 g, and on older animals aged about 2 years and weighing 30-32 g. Bilateral adrenalectomy was carried out under ether anesthesia by the method described for rats [3]. After the operation and for the period of the experiment all the animals were kept on a salt-added diet, in which water was replaced by a 0.9% solution of NaCl. In these conditions the mice survived for 3-4 weeks after the operation. The animals were infected with suspensions of a living culture 6 days after adrenalectomy, or they received an injection of phagolyzate 48 h and 6 and 12 days after the operation. Deaths of the animals during the first 48 h were counted. Each experiment was repeated 3 times, after which the numerical results were analyzed by the statistical method of Reed and Muench and the values of LD₅₀ for the adrenalectomized and control animals were compared.

Altogether 3 series of experiments were carried out on about 1000 mice.

EXPERIMENTAL RESULTS

The lethal doses of living cultures of 12 freshly isolated and reference strains of *E. coli* O₅₅:B₅ were determined in the adrenalectomized and intact animals. As the table showed, LD₅₀ of all the strains for adrenalectomized mice varied from 5 to 16 million bacterial cells. In the control observations on the intact animals the strains examined showed significant differences - their LD₅₀ varied from 50 to 1500 million cells. Adrenalectomy increased the sensitivity of the mice to infection by these strains unequally, by between 6 and 300 times.

It follows from these results that the toxicity of the bacterial cells of all the strains examined was identical, because the ability of the bacteria to proliferate in albino mice differed very considerably. Because of this, when determining the comparative virulence of strains, experiments on normal animals were more suitable, and for detecting slight differences in toxicity, experiments on adrenalectomized animals were preferable.

In the experiments of series II the toxicity of the phagolyzate of enteropathogenic strain O₅₅:B₅ of *E. coli* was determined in mice weighing 16-18 g. The value of LD₅₀ of this preparation for normal animals exceeded 1 ml. In adrenalectomized animals, 48 h after the operation, it was 0.18 ml, 6 days after - 0.22 ml, and 12 days after - 0.4 ml. Hence, for determining the toxicity of the phagolyzate, it was best

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Comparison of Virulence of 12
Enteropathogenic Strains of
E. Coli O₅₅:B₅ for Normal and
Adrenalectomized Mice

Strain No.	LD ₅₀ (in millions of bacterial cells)		LD ₅₀ exp./ cont.
	For adrenal- ectomized mice (exp.)	For normal mice (control)	
16	6,2	50	1:8
2	10	83,5	1:8,3
22	8,4	87	1:10
23	16,6	100	1:6
8	14	106	1:7,5
4	12	112,5	1:9,3
35	10	168	1:17
36	7,5	210	1:28
38	6,9	500	1:71
19	7,2	1 000	1:139
26	10	1 300	1:130
21	5	1 500	1:300

to use the animals 2-6 days after adrenalectomy, but after longer intervals their increased sensitivity persisted at almost the same level.

The experiments of series III were carried out in accordance with the same scheme on old mice weighing about 30 g. The results were similar. Hence, the age of the animals was not important when determining the residual toxicity of phagolyzates.

LITERATURE CITED

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