

6324

Calcium and Nitrogen Content in Urine of Normal and Cancer Mice.*

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Crocker mouse sarcoma 180 represents a very stable type of tumor. After inoculation into the strain of mice used by us the tumor grows in 95-98% of the animals. Its rate of growth is very rapid. The animals usually die about 6 weeks after transplantation.

We observed that the composition of the urine of the sarcoma mice differs in certain respects from that of the urine of normal mice. The urine of normal mice gives a copious precipitate on addition of metaphosphoric, acetic acid (Bang's reagent) or sulphosalicylic acid; this precipitate is markedly diminished in the urine of mice previously inoculated with sarcoma 180. Before the addition of the precipitating reagent, the urine was filtered or centrifuged and the supernatant fluid decanted. The urine of mice has a pH 5.6. After filtration the urine still remains opalescent. Following addition of a diluted mineral acid the urine becomes turbid.

We observed that the addition of sodium fluoride preceding the addition of the precipitating reagent inhibits the formation of the precipitate in the urine of normal mice which otherwise takes place under the influence of metaphosphoric acid. This indicated the importance of calcium in the production of the precipitate.

We compared therefore the concentration of calcium in urine of 150 normal and 150 sarcoma mice. Amount of Ca in mg. per 1 cc. of urine: Normal mice, 0.056-0.13; cancer mice, 0.023-0.042.

Urine of cancer mice contains therefore a smaller amount of calcium than urine of normal mice. It was possible to increase the amount of calcium in urine, normal as well as of cancer mice, by the previous oral administration of calcium salts to the animals. Thus after oral administration of 0.1 gm. of calcium gluconate in 2 cc. H₂O we found in 1 cc. of urine of a sarcoma mouse collected during the following 12 hours 0.5 mg. Ca. After oral administration of 0.025 gm. of calcium gluconate in 2 cc. H₂O, 1 cc. of urine collected during the following 12 hours contained 0.18 mg. Ca.

*These investigations were carried out partly with the aid of a grant for research in science made to Washington University by the Rockefeller Foundation. I wish to express my thanks to Dr. Leo Loeb for his suggestions during the course of these experiments.

The precipitate obtained from the urine of mice by metaphosphoric or acetic acid is insoluble in cold water, in 70% alcohol and in dilute acids, but it is readily dissolved in weak and strong alkali as well as in strong mineral acids. The precipitate dissolved in weak alkali could easily be reprecipitated by addition of weak acids. The fact that such a precipitate could be obtained from urine of mice by means of metaphosphoric acid, acetic acid, or sulphosalicylic acid, and furthermore the positive Heller's ring test with urine, as modified by Roberts, indicates the presence of protein in the urine of mice.

The biuret test with the precipitate is likewise positive.

The *total nitrogen* content of urine of mice amounts to 25-30 mg. of N per 1 cc. of urine. We then made a separate analysis of nitrogen content of the precipitate and of the supernatant portion of the urine in which precipitate had been produced with acetic acid (Bang's reagent). From the data obtained it was possible to calculate the amount of coagulable and noncoagulable nitrogen in the total urine.

Amount of nitrogen in mg. in 1 cc. of urine.		
	Coagulable N (corresponding to N of precipitate)	Noncoagulable N.
Normal mice	5.6-10	20-24
Cancer mice	2 - 3	19-25

These results indicate that after transplantation of sarcoma 180 there takes place in the urine of tumor mice (1) a diminution in the concentration of calcium; (2) a diminution in the amount of coagulable nitrogen.

6325

Ineffectiveness of Calcium, Potassium, and Magnesium Salts Against Symptoms of Anaphylactic Shock.

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It is well known that changes in the balance of calcium and potassium ions may produce definite effects upon the neurocellular responses of animals and man. Warnant,¹ and Thornton and Gillespie² have shown that such alterations in the concentration of

¹ Warnant, H., *Arch. Internat. de Pharm. et de Therap.*, 1930, **27**, 61.

² Thornton and Gillespie, cited by Bray, G. W., *Recent Advances in Allergy*. Blakeston's. 1931. p. 27.