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### **Roentgen Ray Therapy in Pneumococcus Type I Infection in Rabbits.**

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Several clinical studies suggest the value of roentgen ray therapy in the treatment of pneumococcus pneumonia. To test the effect of roentgen ray therapy on experimental pneumococcus infections under controlled conditions, the following work was done.

After the method of Goodner, 0.1 cc of a 1:1000 dilution of an 18-hour blood broth culture of pneumococcus Type I was inoculated endermally into the shaved skin of the abdomen of each of 4 rabbits each weighing approximately 2 kg. One-half hour later roentgen ray therapy was applied to an area 6 cm x 6 cm surrounding the point of injection in 2 animals and the remaining 2 animals served as controls. Rectal temperatures were recorded daily at 9 a.m. and 5 p.m. and blood cultures were made daily from the marginal vein of the ear on the second day following injection. Seven sets of 4 rabbits were observed for 10 days following inoculation and treatment and at the end of that time if the animals were living and the temperature was normal they were considered well.

All of the factors involved in the roentgen ray radiation of these rabbits were constant, except for the time of exposure. The conditions were: 130 kilovolts, 5 milliamperes, 30 cm target skin distance, 2 mm glass filtration delivered through a 6 x 6 cm portal. With the exception of one experiment the radiation was delivered in one dose the r. units ranging from 158 to 990 r. The rabbits in this one test received 158 r. on 2 consecutive days or a total of 316 r.

Of the 14 rabbits exposed to roentgen rays 11 (78.5%) died; while only 6 (42%) of the controls succumbed. At the time of taking blood cultures 2 days after injection bacteremia was present in both treated and untreated animals. It was observed that the temperature of the treated animals usually rose to a higher point quicker than in the untreated animals, reaching a peak on the second day. Generally speaking, the lesions were characteristically different. Those exposed to roentgen rays had a more intense and widespread erythema within two days, became cyanotic and later developed wrinkling of the surrounding skin while the untreated lesions showed

a somewhat more localized swelling with occasional necrotic areas. Both lesions subsided in 4 to 6 days. It was noted that almost invariably the treated animals had a more severe bacteremia, particularly in those which received the larger doses of radiation. In these animals the more severe bacteremia was paralleled by a greater mortality at an earlier date, death usually occurring 4 to 6 days after injection.

*Summary.* Roentgen ray therapy applied one-half hour after inoculation is ineffective in preventing bacteremia or in favorably influencing the outcome in rabbits injected intradermally with pneumococcus Type I. When larger therapeutic doses are employed roentgen rays have apparently a deleterious effect as evidenced by a more pronounced bacteremia and greater mortality.

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#### Vitamin B<sub>6</sub> Deficiency in Chicks.

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Among the members of the vitamin G complex, riboflavin<sup>1</sup> and pantothenic acid<sup>2</sup> are known to have a marked effect in promoting growth in chicks, while nicotinic acid has not been demonstrated to be needed by this species. Several recent reports<sup>3, 4, 5</sup> have indicated that one of more water-soluble factors, unidentified with other members of the vitamin G complex, are needed by chickens. Carter and O'Brien<sup>6</sup> have reported that vitamin B<sub>6</sub> promoted growth slightly in chicks fed a purified diet. The growth rate obtained was very low.

Previous attempts in this laboratory to investigate the vitamin B<sub>6</sub> requirement of the chick were hampered by the fact that a factor or

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<sup>1</sup> Lepkovsky, S., and Jukes, T. H., *Science*, 1935, **82**, 326.

<sup>2</sup> Jukes, T. H., *J. Biol. Chem.*, 1939, **129**, 225.

<sup>3</sup> Lepkovsky, S., and Jukes, T. H., *Proc. Am. Soc. Biol. Chem., J. Biol. Chem.*, 1937, **119**, lx.

<sup>4</sup> Jukes, T. H., and Babeock, S. H., Jr., *J. Biol. Chem.*, 1938, **125**, 169.

<sup>5</sup> Stokstad, E. L. R., and Manning, P. D. V., *J. Biol. Chem.*, 1938, **125**, 687; Lepkovsky, S., Taylor, L. W., Jukes, T. H., and Almquist, H. J., *Hilgardia*, 1938, **11**, 559; Bauernfeind, J. C., Schumacher, A. E., Hodson, A. Z., Norris, L. C., and Heuser, G. F., *Proc. Soc. Exp. Biol. and Med.*, 1938, **39**, 108.

<sup>6</sup> Carter, C. W., and O'Brien, J. R., *Proc. Seventh World's Poultry Congress*, 1939, p. 126.