6196

An Improved Method of Protecting the Peritoneum of Dogs against Fatal Colon Bacillus Infection.*

BERNHARD STEINBERG.

From the Laboratories and the Department of Medical Research of Toledo Hospital, Toledo, Ohio.

The method here described produces a protection of the peritoneum against a fatal infection by means of a single intraperitoneal injection. The maximum protection is obtained in 48 hours with some degree within 12 hours. The protection produced is against any of the organisms that are common to the gastro-intestinal tract. Goldblatt and I[1] observed that *B. coli* suspended in physiological sodium chloride and injected intraperitoneally passed rapidly from the peritoneal cavity into blood and lymph. However, *B. coli* suspended in gum tragacanth was found to be retained to a marked degree within the peritoneal cavity. Subsequent experiments[2, 3, 4, 5, 6] demonstrated that peritoneal protection against a fatal infection can be achieved by the production of a sufficiently large number of polymorphonuclear phagocytes which appear rapidly. This process was designated as hyperleukocytic pre-immunity and the protection was assumed to be due to a coincident presence of phagocytes evoked by the introduction of the material.

In previous experiments peritoneal protection was achieved by 4 intraperitoneal injections of *B. coli* suspended in physiological sodium chloride on successive days with a survival of 65% of the animals. Since the peritoneal protection was found to be due to a local migration of polymorphonuclears and, since *B. coli* in physiological sodium chloride passed from the peritoneal cavity but were retained when suspended in gum tragacanth, it was deduced that a suspension of *B. coli* in gum tragacanth may constitute a more efficient protecting substance.

Thirty-two dogs were given single intraperitoneal injections of one billion heat killed *B. coli* (culture 300) suspended in 1% gum

* This work is aided by a grant by the Committee on Scientific Research of the American Medical Association.

1 Steinberg, B., and Goldblatt, H., *Arch. Int. Med.*, 1927, **39**, 449.

2 Steinberg, B., and Snyder, D. A., *Arch. Path.*, 1929, **8**, 419.

3 Steinberg, B., *Arch. Surg.*, 1931, **23**, 145.

4 Steinberg, B., PROC. SOC. EXP. BIOL. AND MED., 1931, **29**, 16.

5 Steinberg, B., PROC. SOC. EXP. BIOL. AND MED., 1931, **29**, 18.

6 Steinberg, B., *Arch. Surg.*, 1932, **24**, 308.

tragacanth (bacteria were killed at 80°C. for 10 minutes). At intervals of 12, 24, 48, and 72 hours following the protecting injections, a peritonitis was induced by the intraperitoneal injection of living *B. coli* suspended in 2½% gum tragacanth. Twenty-five control dogs were given similar injections of living *B. coli* in gum tragacanth. All the control dogs died. The percent of survivors of protected dogs was 40, 60, 80 and 75% respectively.

In spite of the peritonitis which was overwhelming in character and sudden in onset, the best survival percentage is 80 as contrasted with 65% by the former method. The material used for the production of peritonitis is several times the lethal dose for a dog of average weight.

Other experiments indicate that there is a quantitative relationship between the amount of the protecting substance and the percentage of surviving animals. There was a decreasing number of surviving dogs with a decrease in the number of bacteria composing the substance. These experiments also demonstrate that the gum tragacanth itself is not an important factor in the production of the peritoneal protection.

It was demonstrated previously[7] that the use of *B. coli* (culture 300) as a protecting substance resulted in survivals of animals with peritonitis induced by introduction of feces containing many and varied bacteria. Experiments with the protecting substance here described confirm the formerly expressed view.

Examination of the peritoneum of the animals injected with the protecting substance did not reveal presence of adhesions.

6197

Homolateral Synchronism of Lymphatic Hearts.

FREDERICK H. PRATT AND MARION A. REID.

From the Department of Physiology, Boston University School of Medicine, and the Evans Memorial, Massachusetts Memorial Hospitals.

It is a long recognized fact that the opposite members of each of the 2 pairs* of anuran lymph hearts do not beat in unison. There has apparently resulted a universal assumption that the same lack

[7] Steinberg, B., and Goldblatt, H., *Arch. Int. Med.*, 1928, **42**, 415.

* The posterior pair is of multiple origin, and in certain of the Salientia retains the separate character.