

Effect of Gastric Mucin on Virulence of Bacteria in Intraperitoneal Injections in the Mouse.

W. J. NUNGESTER, A. A. WOLF AND L. F. JOURDONAIS.

From the Department of Bacteriology, Northwestern University Medical School.

While studying the effect of such substances as gelatin and gastric mucin on the phagocytosis of the pneumococcus in the peritoneal cavity of the mouse, it was noted that the animals receiving pneumococcus suspended in mucin died sooner than the control animals receiving the same dose in saline. In further studies we have used samples of dried commercial gastric mucin sterilized, or at least made innocuous to mice by heating at 140°C. for 1 hour *in vacuo* or by allowing it to soak in 80% ethyl alcohol for 1 week, then removing the alcohol by decanting and evaporating *in vacuo* at 40°C. Four gm. of mucin so prepared were added to 100 cc. of saline and this served as the menstrum in which was suspended an indicated dilution of a 24-hour glucose broth culture of the organism under examination. One cc. of the resulting suspension was then inoculated into the peritoneal cavity of a mouse.

The results obtained in the case of the pneumococcus II, as indicated in the table, show that death occurs much sooner in animals injected with organisms suspended in mucin than in those receiving a saline suspended inoculum. This culture also was lethal in a higher dilution when inoculated with mucin than when saline was used. A number of experiments with a hemolytic streptococcus culture were performed over a 5-month period during which mice were incubated in pairs with the mucin and saline suspended organisms respectively. The results were quite constant and, as seen from the summary of these experiments in the table, there is both an increase in the number of deaths and a decrease in the time of death for mice injected with the streptococcus suspended in mucin. We never succeeded in killing mice by injecting intraperitoneally 1 cc. of a 1:10 dilution of a recently isolated *Staphylococcus aureus* culture suspended in saline. When this culture, however, was suspended in mucin and injected, death usually followed in less than 20 hours. It was only after the culture had been in the laboratory several months that it failed to kill constantly when suspended in mucin.

Various sites of inoculation have been tried and this work is still under investigation. When the inoculation is made in the tail vein

TABLE I.

Organism	Mucin			Saline		
	No. Mice Inoc.	Dead	Av. Time Hr.	No. Mice Inoc.	Dead	Av. Time Hr.
Pneumo. 1:10	6	6	17	6	6	35
1:100	8	8	20	6	6	97
1:1000	4	4	20	4	4	63
1:10,000	2	2	32	2	0	—
1:1,000,000	2	0	—	2	0	—
Strept. 1:10	31	30	21	31	18	58
Staph. 1:10	12	7	16	12	0	—

of a mouse the effect of the mucin is not apparent. Of 6 mice injected intravenously with 0.5 cc. of streptococcus in mucin but 2 died and these in 120 hours. Similar results were obtained when the organisms were injected in saline whereas the same dose in mucin injected intraperitoneally killed 5 out of 5 mice in 17 hours and 4 out of 5 mice in 69 hours when the organisms were suspended in saline. Subcutaneous inoculations of mucin suspended inoculum appear to be no more lethal than similar doses of the organisms suspended in saline.

We have determined that agar, starch or gelatin which may offer a similar temporary protecting coat to the organism against the defensive mechanism of the host also tend to increase the virulence of the bacteria but not nearly as effectively as mucin. Acidulated gelatin (pH 3.0) was used as a means of irritating the peritoneum but did not hasten the invasion of the bacteria. Mice injected first with India ink to block the fixed phagocytic cells did not increase the susceptibility of the animals. If 1 cc. of 4% mucin is injected not longer than 5 or 6 hours before the introduction of 1:10 cc. of streptococcus culture into the peritoneal cavity of the mouse, the effect of mucin on the virulence of the organism is obtained.

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Peripheral Blood Chemistry Changes After Unilateral Lumbar Sympathectomy.

PAUL E. MC MASTER. (Introduced by Lester R. Dragstedt.)

From the Department of Surgery, University of Chicago.

Few studies have been reported on peripheral blood chemistry changes subsequent to sympathectomy. Fontaine and Jung¹ did

¹ Fontaine, R., and Jung, A., *La Presse Med.*, 1928, **36**, 1079.