The most striking feature of the results was the almost complete absence of phosphatase in the periosteum and sub-periosteal structures, where it is normally abundant. This observation suggests a relationship between the extremely defective calcification of the cortex and the lack of phosphatase. That phosphatase may be mobilized from other sources under special conditions, however, is indicated by the greatly increased activity in the region of callus formation.

The extremely low phosphatase activity found in the duodenum may be of significance in relationship to defective phosphorus absorption. Normally the duodenum shows a higher phosphatase activity than other segments of the gut.

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Prophylactic Vaccination Against Intracranial Complications Following Pneumococcus Type III Mastoiditis.

GREGORY SHWARTZMAN, JOSEPH L. GOLDMAN AND CECELE HERSCHBERGER.

From the Laboratories and the Otological Service, Mount Sinai Hospital, New York City.

Inasmuch as intracranial complications following pneumococcus Type III mastoiditis are known to occur, as a rule, not earlier than several weeks after the initial infection, serious attempts to induce a state of active acquired immunity should receive special consideration. The use of prophylactic vaccination was suggested by Kolmer and Amano on the basis of their work in rabbits in which immunization with pneumococcus vaccines elicited protection against experimental meningitis.[1] Barach found that type-specific active acquired immunity appeared within 6 days after intradermal or intravenous injection of pneumococcus type-heterologous vaccines in cases of lobar pneumonia.[2]

Accordingly, in September, 1931, we undertook to immunize every case of pneumococcus Type III mastoiditis admitted to the Otological service of The Mount Sinai Hospital as soon as the bacteriological diagnosis was made, whether that be before or after the operation. The following method of vaccination was employed:

[1] Kolmer, J. A., and Amano, K., *Arch. Otolaryngology*, 1931, **14**, 125; 1932, **15**, 547.

[2] Barach, A. L., PROC. SOC. EXP. BIOL. AND MED., 1928, **25**, 558; *J. Exp. Med.*, 1931, **53**, 567.

The patients were given a course of 6 intradermal injections, 2 a week, in the following increasing doses: 0.1 cc., 0.2 cc., 0.3 cc., 0.5 cc., 0.7 cc., and 1 cc. For doses larger than 0.2 cc. several simultaneous injections of 0.2 cc. each were made. In order to avoid loss of time, a stock vaccine was used for the initial injection. This was done never later than 48 hours after the operation and sometimes before the operation. For the remaining 5 injections an autogenous vaccine was used. The autogenous vaccine was prepared by growing a pure culture of pneumococcus Type III in 100 cc. of 1% glucose broth for 24 hours. The organisms were centrifuged, washed once and then resuspended in 0.85% NaCl solution to obtain a concentration of six hundred million organisms per cc. The bacteria were then killed by heating at 60° for one-half hour.

Twenty-seven cases of pneumococcus Type III mastoiditis have been admitted to this hospital since September, 1931. Of these 2 died within 48 hours after operation and since they received either no vaccination or only one injection the day before death, they will not be considered in this series. Of the 25 patients receiving the vaccine-therapy, one patient promptly recovered but 4 months later developed meningitis and died. The remaining 24 cases made uneventful recoveries. Thus, the mortality rate of our vaccinated series was 4%.

During a period of 5 years (1927 to 1931) prior to this work, 547 patients suffering from mastoiditis were admitted to this hospital. Of these, 525 suffered from non-pneumococcus (streptococcus hemolyticus, etc.) mastoiditis and 22 from pneumococcus Type III mastoiditis. Of these twenty-two, 5 died of meningitis, thus forming a mortality rate of 22%.

We are well aware of the fact that our cases constitute too small a group from which to draw definite conclusions; that the pneumococcus Type III mastoiditis might have been of a milder type during the past 3 years; and the lower incidence of cerebral complications in our vaccinated series might have been merely a fortunate coincidence. However, we feel that the facts presented warrant a preliminary report in order to stimulate further work along these lines.

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