

Acid Phosphatase Activity in the Intestinal Wall in Experimental Amebic Colitis.* (17786)

G. M. CARRERA (Introduced by E. C. Faust)

From the Department of Tropical Medicine and Public Health, Tulane University School of Medicine, New Orleans, La.

Acid phosphatase activity has been demonstrated in *Endamoeba histolytica* of human origin grown in artificial culture media or obtained by rectal aspiration from an experimentally infected animal(1). The present report describes the results obtained when tissue sections of amebic lesions were submitted to the acid phosphatase test.

Materials and methods. Amebic colitis was experimentally produced in guinea pigs by intra-ileal inoculation with large numbers (over 200,000) of amebic trophozoites (Tulane strain XXII) grown in Balamuth's medium(2). Four to 7 days after inoculation the animals were sacrificed and portions of cecum with extensive amebic lesions were selected for study. Gomori's histochemical technic for the demonstration of acid phosphatase in tissue(3) was used throughout the experiment. Duplicate sections submitted to identical procedure except for the absence of the glycerophosphate substrate from the incubating solution, served as controls. All sections were incubated overnight.

Results. Very heavy precipitate occurred in and around the areas of amebic invasion, (Fig. 1), revealing that intense acid phosphatase activity was present in those regions. Isolated amebae at some distance from active ulcers were also strongly positive, while the surrounding host tissues did not show any demonstrable enzymatic activity. Foci of black precipitate which did not correspond to

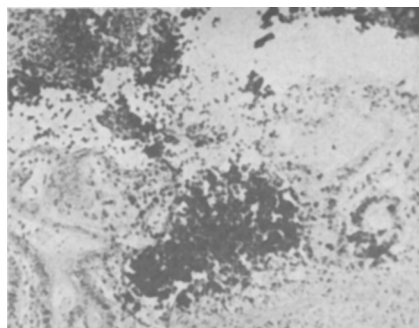


FIG. 1.

Flask shaped amebic ulcer showing heavy lead sulfide precipitate in the crater of the ulcer, and on the exudate covering the ulcer and adjacent mucosa. The host tissues surrounding the ulcer are negative. Isolated amebae in a nearby gland and in the exudate are strongly positive. Minute foci of phosphatase activity which do not correspond to amebae are also seen. The section was weakly counterstained with H & E to provide an adequate background. 100 X.

the amebae themselves were also observed, but always in, or near, active amebic colonies. It is not known, yet, what these foci of acid phosphatase activity represent, but judging from their size, shape and location, they might be either fragments of disintegrating amebic protoplasm or small microorganisms that may be present in the amebic lesions. It is worthy of emphasis, however, that in the areas not affected by the amebae, no such foci of phosphatase activity were evident.

Since all the controls were negative, it can be concluded that the precipitate represented acid phosphatase activity. The unusually strong reaction at the sites of greatest amebic invasion, as well as in the isolated amebae themselves, confirms the original impression(1) that *E. histolytica* has a high concentration of acid phosphatase.

* Supported by a Grant-in-Aid, Division of Research Grants and Fellowships, the National Institutes of Health, Bethesda, Md.

1. Carrera, G. M. and Changus, G. W., Proc. Soc. Exp. Biol. and Med., 1948, v68, 610.

2. Balamuth, W., Am. J. Clin. Path., 1946, v16, 380.

3. Gomori, G., Am. J. Clin. Path., 1946, v16, 347.

Received March 28, 1950. P.S.E.B.M., 1950, v73.