

THE EDEMA OF PARA-PHENYLENEDIAMINE.—By O. S. GIBBS, M.B., CH.B., Department of Pharmacology, Dalhousie University, Halifax, N. S.

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ABSTRACT.

Continuous small injections (0.02 cc. per 2 sec. of 0.4% paraphenylenediamine), when introduced into arteries without interfering with the blood flow, caused marked edema of the part supplied. Trypan blue added to the injecting fluid intensified this effect by coloration. It is concluded that para-phenylenediamine is poisonous to all vessels if acting in sufficient concentration over sufficient time.

Some years ago I published a paper¹ concerning edema of para-phenylenediamine in which, on the basis of certain results unlike those of previous authors who claimed a specific action localized in the head and neck tissues, I concluded that the edema produced was in reality to be considered as evidence of a generalized poisoning. This view was contradicted by Hanzlik², Tainter³, and others who again postulated gross specificity of the head and neck area.

Investigation of this question has brought to light, however, evidence supporting my view that the poisoning of para-phenylenediamine is really to be considered as a generalized condition with marked lesions usually in the head and neck, rather than a specific action confined to the head and neck. All authors agree that at the site of injection of para-phenylenediamine marked edema occurs showing that this substance is edema-forming providing that there is present a sufficient concentration of the drug, or perhaps a lesser concentration acting over a longer period.

EXPERIMENTAL.

Experiments were conducted in which, by means of a fine needle inserted into an artery, para-phenylenediamine was injected into the blood stream of a given area without inter-

1. Gibbs, *J. Pharmacol.*, **20**, 221 (1922).
2. Hanzlik, *J. Ind. Hyg.*, **4**, 386 (1923).
3. Tainter, Hanzlik, *J. Pharmacol.*, **24**, 179 (1924).

fering with the normal blood supply. Approximately 0.1 to 0.2 grams of para-phenylenediamine per kilo were injected, using cats as subjects. The para-phenylenediamine was dissolved in about 25 cc. of saline and was injected at the rate of 0.02 cc. per 2 sec. In all cases a marked edema occurred in the area of arterial distribution. These experiments were repeated with the addition of 0.2 gram trypan blue to the injecting fluid. In all cases the injected area showed a deep staining of the trypan blue. Similar experiments with trypan blue alone as control did not give staining. It is clear from these experiments that para-phenylenediamine is able to produce edema in any area if conditions be suitable. A study of these conditions is being made and will be reported in a further publication.

The explanation of the localization of the effects of para-phenylenediamine in the head and neck area which is commonly seen is as yet not clear.