HISTOLOGICAL CHANGES IN THE KIDNEYS OF ALBINO MICE INFESTED BY KLOSSIELLA MURIS

P. A. Bogovsky

From the Institute of Experimental and Clinical Medicine, Acad. Sci. Estonian SSR, Tallin.

(Received March 10, 1955. Presented by E. N. Pavlovsky, Member Acad. Med. Sci. USSR).

The intracellular protozoan Klossiella muris, belonging to the class of Sporozoa, order Adeleida, family Klossiellidae, commonly parasitizes the kidneys of mice, including laboratory albino mice; according to Stevenson [10] 40% of mice harbor this parasite, which was first described by Smith and Johnson [8], and subsequently by a number of other authors [7, 9, 10, 11]. Fiebiger [8] remarks that the presence of exudates in the kidneys of the affected mice testifies to the pathogenic properties of the parasite. P. P. Sakharov [1] also reports presence of exudates in the kidneys, lungs, and other organs.

The published histological descriptions of the condition do not give a clear picture of the changes taking place in the kidneys of mice parasitized by Klossiella muris. Evidently, it is because of this, as well as because of the contradictory reports found in the literature that pathologists have given mistaken interpretations of the histological picture found in the kidneys of laboratory mice used in experiments. Thus Luger and Silberstein [4], for example, took the intracellular form of Klossiella muris to be a special case of phagocytosis, for which they coined the term "isophagocytosis". Seemann [6] describes a variety of nephrosis of albino mice, characterized by lysis of the cells of the convoluted tubules. We have seen no more recent references in the literature to this parasite, although the number of mice used yearly in laboratory experiments in the Soviet Union must amount to tens of thousands. It is reasonable to believe that in many cases the presence of the parasite has not been recognized, and that the histological changes in the kidney, which are often more readily perceived than is the parasite itself, have been erroneously ascribed to the particular experimental conditions used, and have been incorrectly interpreted.

The object of this paper is to make research workers more widely cognizant of the more important forms of histological changes in which it is possible to discern the parasites which are the cause of these pathological changes in the kidneys of white mice.

Our experimental material consisted of the kidneys of 230 white mice, used for various experimental purposes in our laboratory. The kidneys were fixed in 10% formalin, and embedded in celloidin; sections 8 μ thick were stained with iron hematoxylin (Weigert), and counterstained with eosin or picroroofuchsin (according to Van Gieson).

The kidneys of mice infested by Klossiella muris often differ from those of healthy animals in being of a paler color, and in the slightly granular appearance of their external surfaces. These macroscopic changes are of different degrees of intensity, and are not always perceptible.

In one group of 200 mice we found 15 cases of infestation, and, in another group of 30, 9 cases. It is evident from this that the incidence of infestation can vary within wide limits in different groups.

The various stages of development of the parasite described in the literature were recognized in the glomeruli (Fig. 1) and convoluted tubules (Fig. 2) of the kidney. Additionally, round bodies, diameter 10-12 μ, staining bright lemon-yellow with picric acid, are not infrequently found in the convoluted tubules. These bodies (evidently
Fig. 1. Schizogony of the parasite in a glomerulus of the kidney of a white mouse. Stained hemotoxylin-picrofuchsin. Photomicrograph, magnification x 600.

Fig. 2. Sporocysts in the budding stage, in cells of a convoluted tubule. Stained hemotoxylin-picrofuchsin. Photomicrograph, magnification x 600.