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# Changes in Reissner's Membrane of the Rat after Chemical Sympathectomy with 6-Hydroxydopamine

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The inner ears of rats chemically sympathectomized at birth were studied electron microscopically and compared with those of litter mates left untreated for use as controls. Treated animals 11–72 days of age showed changes in Reissner's membrane with respect to (1) glycogen storage; (2) size of the intercellular clefts; and (3) numbers of coated vesicles. At 11 days, glycogen particles ~ 150–300 Å in diameter were present in Reissner's membrane in both control and treated rats but were more numerous in the treated animals. The particles were especially common in epithelial cells in the region of attachment of the membrane to the spiral limbus. By 17 days, glycogen particles increased in the epithelial cells throughout the membrane in treated rats. Some narrowing of the intercellular clefts and a decrease in coated vesicles had also occurred. By 32 days, large patches of glycogen had accumulated, and the intercellular clefts of the epithelial cells were uniformly narrow. Coated vesicles were not numerous. Control rats 17–32 days old did not show similar ultrastructural findings; instead, the epithelial cells had numerous coated vesicles, variously dilated intercellular clefts, and no evident glycogen. By 72 days, the treated rats had a more normal-appearing Reissner's membrane; there was an apparent upturn in coated vesicles, and intercellular clefts were variously dilated. However, some patches of glycogen were still evident. The results are interpreted to indicate that Reissner's membrane has an energy dependent, coupled ion/water transport system that is ordinarily supported by glucose metabolism. Glucose metabolism, in turn, appears to be regulated by catecholamines, suggesting that $\beta$ adrenergic receptor sites exist on the epithelial cells of Reissner's membrane. The possible relevance of these findings to endolymphatic hydrops of Meniere's disease will be discussed.

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