The Effect of Chlorothiazide on the Urinary Excretion of Sodium, Chloride and Potassium in the Marine Dogfish (Squalus Acanthias)

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Chlorothiazide is a diuretic, which in dog and men inhibits the renal reabsorption of sodium and chloride, in addition to its weak inhibitory effect upon carbonic anhydrase. The kidney of the marine dogfish (squalus acanthias) contains no carbonic anhydrase sensitive to inhibition by Diamox® and therefore would be suitable to separate the carbonic anhydrase and non-carbonic anhydrase dependent diuretic effect of chlorothiazide.

50-200 mg of the drug were given i.v. to 8 fish, weighing between 1.5 and 7.3 Kg, after collection of control urine and blood specimens. The second urine and blood specimen was obtained 2½-6 hours after the injection of the compound. Blood, plasma and urine samples were analyzed for pH, total CO_2, sodium, chloride and potassium content.

In blood or plasma the total CO_2 content and pH (6 out of 8 experiments) increased consistently after chlorothiazide.

In the urine, neither the volume, the pH or the excretion of sodium, chloride, potassium, titrable acid and carbon dioxide changed in any consistent fashion. These data indicate that chlorothiazide, as well as Mercuhydrin and Diamox, are unable to affect the excretion of sodium or chloride by the dogfish kidney.

The Removal of Leukemia Cells From the Blood Stream

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Experiments were performed to determine if leukemia cells were removed from the circulation more readily by the spleen, lung, or kidney. The lymphatic leukemia, BW 5147, was used in AKR mice. Leukemia was produced in mice by an intravenous injection of a suspension of leukemia cells. One to two weeks after this injection, equal volumes of blood were removed from the splenic vein, aorta, and renal vein of each leukemic mouse. Each aliquot of blood was then injected intravenously into a normal mouse. The life span of the mouse, between the time of intravenous injection of blood and the time of death from leukemia, was used as a relative index of the number of leukemia cells in the injected blood. The results indicated that the kidney permitted more leukemia cells to pass through than did the lung or spleen. The lung and spleen showed no difference in their ability to remove leukemia cells. The results are preliminary because of the paucity of experiments, but the results suggest that further experiments of this type are warranted.