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Effect of Intravenous Injection of Dakin's Solution on Cholecystectomized Dogs.

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The production of cholecystitis by intravenous injection of a solution of chlorinated soda (Dakin's solution), was first reported by Mann.[1] He found that from 5 to 12 cc. per kg. body-weight, of a solution of chlorinated soda, having an available chlorine content of at least 0.48%, would produce a cholecystitis in dogs in 12 to 24 hours following the injection.

Since Dakin's solution seems to act specifically on the gall-bladder, its injection might prove fatal if the gall-bladder were removed, and, if so, the gall-bladder must act as the specific organ of elimination or detoxification. Such an assumption is justified by the observation of Mann, which we have confirmed, that the solution reaches the gall-bladder via the blood stream and not the bile.

Eleven normal dogs were injected intravenously with 10 cc. per kg. body-weight of a solution of chlorinated soda (Dakin's solution) containing 0.49% available chlorine. One dog died within 24 hours and the autopsy showed a cholecystitis. The other 10 were etherized after from 40 to 48 hours, and necropsies performed immediately. Of these, 3 showed normal gall-bladders, the remaining 7 all had cholecystitis of varying degrees of intensity. Several of these dogs had small hemorrhages beneath the serous coat of the liver adjacent to the gall-bladder; one having a large area of hemorrhage, 5 cm. x 2.5 cm.

Four healthy dogs on which cholecystectomy had been performed 3 weeks previously were then injected intravenously with 10 cc. per kg. body-weight of Dakin's solution containing 0.49% available chlorine. Two hours after the injection all the dogs were noticeably uncomfortable, and 3 of them were vomiting. All of these dogs were alive and apparently in good condition 3 days after the injection.

Because Doctors Shrager, Ivy and Kronenberg, in our laboratory had incidentally observed that death sometimes resulted when Dakin's solution was injected into dogs having a balloon in the gall-bladder; and because our cholecystectomized dogs all survived the injection of Dakin's, we thought that ether anesthesia might play some negative rôle in the elimination or detoxification of the solution. So, 3 days following the above injections, the cholecystectomized dogs were anesthetized with ether for from 15 to 30 minutes, and then allowed to recover. They were then given a second injection of like quantity of Dakin's solution containing 0.49% available chlorine. Forty-eight hours following this injection one dog died. The necropsy was entirely negative. The remaining 3 dogs were apparently unaffected by this injection, being in good condition 5 days later.

From these results, we conclude that the intravenous injection of Dakin's solution is somewhat more toxic in cholecystectomized dogs than in normal dogs.

[1] Mann, *Ann. Surgery*, 1921, lxxiii, 54.

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The Source of Urinary Proteins.

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It was previously reported by one of us[1] that complete picture of uremia in all its clinical, pathological and chemical details could be produced by the injection of hypertonic salt solutions into animals already made acid by the absorption of autogenous edema fluid. In these animals, although the kidneys remained histologically normal, there were evidences of degenerative changes in the liver. It was thought possible that the proteins in the urine in these experiments originated in the liver, and were the exciting cause of the renal changes which afterwards made the kidneys permeable to blood proteins. It is well known that foreign proteins injected into the blood are excreted almost quantitatively and that after a certain period the kidneys are thus rendered permeable to blood proteins as well.

Proteins from these artificial uremias and also those in the urine of dogs with ether nephritis were studied. Rabbits were sensitized to dogs' blood proteins by the subcutaneous injection of dog serum in the following series of doses: 1, 2, 4, 6, 8, and 10 cc. at 3 day intervals. The rabbits were sacrificed on the 21st day and bled. Sera thus obtained will react to dog blood proteins in dilutions of 1/1,000,000.