ON THE INFLUENCES OF THE SPLENIC COMPONENTS OF VARIOUS ANIMALS ON THE EXPERIMENTAL HEPATIC DISTURBANCES

II. INFLUENCES OF THE SPLENIC COMPONENTS OF HOG, RABBIT AND HORSE*

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INTRODUCTION

In my previous report (1), the experiments on the influences of splenic components of cattle on the hepatic disturbances induced by carbon tetrachloride in mice were described in detail. As the results, conclusions were drawn that among the splenic components of cattle, tyrosine-like crystal (1), which was isolated from alcohol insoluble fraction demonstrates extremely strong inhibitory action against the hepatic disturbances, and that among the extracts, the acetone insoluble extract isolated from alcohol soluble fraction acts most effectively.

In this report, the inhibitory action against hepatic disturbances induced by carbon tetrachloride of various extracts prepared from the spleen of hog, rabbit and horse is investigated, comparing with the results of the cases of splenic components of cattle.

EXPERIMENTAL MATERIALS AND METHODS

The methods of experiments in this paper generally followed those of my previous report, and mice were employed as test animals.

Various extracts were prepared according to the methods recommended by Fujita (2) and Abe (3). In the case of rabbit, alcoholic extract, acetone insoluble extract and acetone soluble extract were used, and in the case of horse, only acetone insoluble extract was used. On the contrary, in the case of hog, the following 9 extracts were subjected to the experiments (Fig. 1).

Alcoholic extract

Acetone soluble extract

Acetone insoluble extract

Ether soluble extract

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Ether insoluble extract
 Ethyl acetate soluble extract
 Ethyl acetate insoluble extract
 Benzol soluble extract
 Benzol insoluble extract

FIG. 1

In the first place, hog spleen containing blood was finely minced and was added with a large amount of distilled water and was well ground. Then it was infused for 1 hour at 50°-60° C before it was filtered. The residue was then infused with warm distilled water again. The previous filtrate was then combined with the resulting filtrate, and was heated on a water bath to complete heat coagulation. The filtrate thus obtained was concentrated to syrupy state, and then was added with a large amount of 94% alcohol until the solution demonstrated no turbidity. After it was kept standing for a while, the solution was

filtered by suction, and the resulting residue was thoroughly washed with alcohol. The alcohol extract thus obtained was distilled under reduced pressure, and it was kept standing at room temperature until crystalline substance settled out. At this stage, it was filtered, and a large amount of acetone was added to the filtrate to extract acetone soluble component thoroughly. The acetone insoluble

TABLE 1. The inhibitory action of acetone insoluble extract isolated from hog spleen

No. of animals			508	509	510	511	512	513	514	515	516	517	
Body-weight before injection (g)			11.2	11.8	9.1	8.4	11.9	15.7	13.4	14.2	13.7	13.9	
Terminal body-weight (g)			14.2	14.0	11.6	10.6	15.3	16.9	16.2	16.5	15.5	15.2	
Survival period (day)			15	15	15	15	15	15	15	15	15	15	
Weight of liver (mg)			1000	1000	800	800	1000	1100	850	1000	1000	1000	
Microscopic appearance	Findings in the interstitial tissues	Connective tissue		-	-	±	-	±	-	±	-	-	
		Glisson's capsules	Hyperplasia of the connective tissue	-	-	-	-	-	-	-	-	-	
			Round cells infiltration	-	+	+	-	±	+	+	±	+	+
			Formation of pseudo biliary ducts	-	+	+	-	+	+	+	-	+	+
			Arterial and venous hyperemia	-	-	-	-	-	-	-	-	-	-
		Kupfer's stellate endothelial cells	Enlargement	+	+	+	+	+	+	+	+	+	+
	Hyperplasia		++	±	+	+	+	±	+	+	+	+	
	Findings in acini	Hepatic cells	Arrangement	I R	I R	I R	I R	I R	SIR	I R	I R	I R	I R
			Albuminoid degeneration	+	+	+	+	+	+	+	+	+	+
			Vacuolar degeneration	+	+	+	+	+	-	±	+	±	+
			Lipoid degeneration	-	+	±	+	+	-	-	±	-	-
			Necrosis	±	+	-	-	-	-	-	-	-	-
			Atrophia of nuclei	-	+	-	-	-	-	-	-	-	-
			Swelling of nuclei	+	+	+	+	+	+	+	+	+	+
	Round cells infiltration	Around the blood vessels	-	+	+	-	±	+	+	±	+	+	
		Around the hyperplastic connective tissue	-	-	+	-	+	-	-	-	-	-	
		In intraacinous area	-	-	-	-	-	-	-	-	-	-	
	Cells infiltration around the central veins		+	±	±	±	±	±	±	-	+	±	

R: Regular, IR: Irregular, SIR: Slightly irregular

residue was added with distilled water and was distilled until acetone odour was completely removed. After it was filtered, distilled water was added to it to make a certain definite volume. This is acetone insoluble extract. It was ninhydrin and biuret negative. The acetone insoluble extract was treated with ether, and then with ethyl acetate and benzol to isolate each respective extract.

Each of the extracts prepared measuring 1 cc corresponded to 1 g of fresh organ.

RESULTS OF EXPERIMENTS

A. In the Case of Splenic Components of Hog

Comparing with the cases of various extracts isolated from cattle spleen, the inhibitory action of various extracts isolated from hog spleen against the hepatic disturbances induced by carbon tetrachloride was weaker. Among various extracts prepared from hog spleen, acetone insoluble extract demonstrated strongest inhibitory action, but the action was generally mild (Table 1), and was not comparable with those of alcohol soluble extract or benzol insoluble extract prepared from bovine spleen. However, even with the acetone insoluble extract of hog spleen, the albuminoid or vacuolar degeneration was successfully restricted within slight degree. Further, the hyperplasia of interstitial connective tissue was also not as intensive as was recognized in the case of the injection of carbon tetrachloride alone. In short, the inhibitory action of various extracts prepared from hog spleen against the hepatic disturbances was generally weak.

B. In the Case of Splenic Components of Rabbit and Horse

In this experiment, alcoholic extract, acetone soluble and insoluble extracts of rabbit spleen, and acetone insoluble extract of horse spleen were employed.

As was in the cases of various extracts of hog spleen, the inhibitory action of the above various extracts against the hepatic disturbances was very weak. Nevertheless, no microscopical findings suggestive of promoting the hepatic disturbances were ever encountered.

SUMMARY

In the investigation of the inhibitory action of various extracts prepared from spleen of hog, rabbit and horse against the hepatic disturbances induced by carbon tetrachloride, the action of the extracts was found to be very weak in all cases. In the case with acetone insoluble extract prepared from hog spleen, the inhibitory action was found to be slightly distinct, but it was not as distinct as was in the cases with extracts prepared from bovine spleen. As was published in my previous report, among various extracts prepared from bovine spleen, acetone insoluble extract demonstrated the inhibitory action most strongly. In view of the above, it is a matter of great interest that the only one among

various extracts prepared from hog spleen, which demonstrated inhibitory action, though very weak in strength, was also acetone insoluble extract.

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REFERENCES

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