

The Phagocytic Activity of Kupffer Cells After Thymectomy

In previous papers we were able to point out the importance of the liver and spleen in phagocytosis¹. Because thymectomy of adult mice reduces the phagocytic activity of the RES², we were interested in examining the phagocytosis of the liver and spleen in relation to the thymus.

Though the phagocytic capacity of the fixed macrophages can be determined by means of radiogold clearance³, this method is not applicable for determining the phagocytosis of individual organs. Therefore, radiogold uptake was measured in order to determine the phagocytic activity of the liver and spleen macrophages.

A further aim of the experiment was to ascertain whether the suppression of immune reaction following

ence does not exist⁵. Also, reactions which stimulate the hypophysis-adrenalcortex system do not modify the phagocytosis⁶. Reduced radiogold clearance after thymectomy allows the assumption that the phagocytic function of the RES is affected by the thymus². The reduced phagocytosis of the liver immediately after thymectomy supports this hypothesis. The normalization of radiogold uptake 7 and 14 days after thymectomy may be a sign of autonomous compensation mechanism of the RES. In view of the high adaptability of the RES this fact is not surprising¹.

It is astonishing that thymectomy and whole-body irradiation do not reduce phagocytic activity. Since a stimulation or suppression of the phagocytic function is accompanied by an equivalent increase or decrease of immune reaction^{7,8}, a decrease of phagocytic activity in immuno-suppression could have been expected⁹.

The radiogold uptake in liver and spleen 30 min after 120 μ g of colloidal Au¹⁹⁸ (in %)

Time after operation	1 day		2 days	
	Liver	Spleen	Liver	Spleen
Thymectomy	46.2 \pm 8.1	1.11 \pm 0.18	56.7 \pm 7.7	1.12 \pm 0.099
Sham thymectomy	68.8 \pm 8.0	1.12 \pm 0.21	65.3 \pm 9.4	1.14 \pm 0.14
Control group	71.4 \pm 7.1	1.17 \pm 0.17	69.4 \pm 6.9	1.16 \pm 0.20
	7 days		14 days	
Thymectomy	70.8 \pm 8.7	1.09 \pm 0.21	67.4 \pm 6.7	1.02 \pm 0.14
Sham thymectomy	69.3 \pm 10.1	1.2 \pm 0.17	70.5 \pm 8.4	1.12 \pm 0.097
Control group	68.1 \pm 9.4	1.2 \pm 0.11	67.6 \pm 9.3	1.17 \pm 0.19
	1 day		14 days	
	Liver	Spleen	Liver	Spleen
Thymectomy + 350 R	50.7 \pm 7.4	1.06 \pm 0.2	68.1 \pm 8.3	1.01 \pm 0.17
Sham thymectomy + 350 R	63.1 \pm 9.3	1.09 \pm 0.17	70.3 \pm 7.7	1.17 \pm 0.10
Control group + 350 R	65.3 \pm 8.9	0.97 \pm 0.15	67.5 \pm 9.4	0.98 \pm 0.18

thymectomy and whole-body irradiation⁴ has any influence on the phagocytic activity of the RE cells of the liver and spleen.

Method. 295 male, 5- to 6-week-old, inbred Swiss mice were divided into 6 groups of 45-50 animals. In each group, 15-18 mice were thymectomized, 15 sham thymectomized and 15 were taken as controls. After 1, 2, 7 or 14 days the animals were decapitated 30 min following intravenous injection of 120 μ g of colloidal Au¹⁹⁸. Liver and spleen were eviscerated and the radiogold uptake was determined in a well-type scintillation counter. 6 h or 7 days after operation, 2 groups were, in addition, whole-body irradiated with 350 R (200 kV, 20 mA, 50 cm FHD, 0.5 mm Cu).

Results. 24 and 48 h after thymectomy, radiogold uptake in the liver is decreased compared to the sham thymectomized and control mice. 7 and 14 days after thymectomy, however, there is no detectable reduction of the phagocytic activity of the liver. Radiogold uptake in the spleen is the same in all groups. After thymectomy and whole-body irradiation with 350 R no influence on the phagocytic activity is seen. The radiogold uptake is equivalent to that after thymectomy alone.

Discussion. The control mechanism of the phagocytic function of the RES is obscure. A central nervous influ-

Zusammenfassung. Die Phagocytoseaktivität der Leber ist 24 und 48 h nach Thymektomie erwachsener Mäuse gegenüber scheinthymektomierten und unoperierten Kontrolltieren erniedrigt. Am 7. und 14. postoperativen Tag hat sich die Speicherleistung der Kupffer-Zellen wieder normalisiert.

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