DISTRIBUTION OF METHYONINE, ^{75}SELENIUM AND ^{86}RUBIDIUM IN ORGANS OF GUINEA PIG WITH EXPERIMENTAL BRAIN OEDEMA PROTECTED BY PROTEIN HYDROLYSATE

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Our previous investigations (6) studied the improved brain blood circulation after an experimental encephalic oedema of guinea pigs protected by protein hydrolysate — Hydroprot (PHH).

In order to reveal out the intimate mechanisms of this favourable effect we had for an object of our present work to investigate the changes of protein metabolism (by Methyonine — M, and ^{75}Selenium — ^{75}Se) simultaneously with the degree of momentary brain circulation and organs' blood supply (by ^{86}Rubidium — ^{86}Rb).

Material and methods

The study covers 32 guinea pigs divided into 2 groups of 16 animals. They are subjected to a 3-day hunger. Each half of both groups is given 1,5 ml/100 g BW PHH per 24 hours, whereas the rest guinea pigs (controls) are given same quantity saline solution. Both, PHH and saline solution, are injected intraperitoneally.

Brain swelling is caused by applying a dry ice (Tzekov, Popdimitrov — 1973) on 3rd day after beginning of hunger diet. 24 hours after the oedema is established the animals are killed.

3 hours before death the guinea pigs of first group are injected intraperitoneally with 2 Ci M+^{75}Se/100 g BW. whereas those of the second group are injected intracardially with 2 Ci ^{86}Rb/100 g BW 45 sec before death. ^{86}Rb is injected through a plastic canule inserted in the right antrum via the external jugular vein.

Results and discussion

Table 1 shows higher values of the registered impulses of M(per gram tissue) in both hemispheres, heart, supranephral glands and intestines of the animals protected by PHH in comparison to those of the control guinea pigs. Kidneys and liver present oposite results which can not be explained for now. We presume that probably greater part of M is already transformed by the more active liver of the experimental animals 3 hours after isotope application and its by-products are included in plasmatic proteins and other organs. As for the kidneys it can be supposed that the organism of the control animals, regardless of its bigger necessities, excretes greater amount of the applied amino-acid (unused), therefore, its accumulation in the kidneys is considerable. Of course, all aforementioned conclusions need further detailed investigations.

Concerning the data of the 4 studied organs, we conclude, that based on M-level distribution, we can determine the state of protein metabolism, respect-

Table 1

Distribution of Methyonine, ^{75}Se and ^{86}Rb in both hemispheres and internal organs

Organs	Methyonine ^{75}Se impul./gram tissue						^{86}Rb impul./gram tissue					
	Experimental animals			Control animals			Experimental animals			Control animals		
	n	$\bar{x}_1$	S_1	n	$\bar{x}_2$	S_2	n	$\bar{x}_1$	S_1	n	$\bar{x}_2$	S_2
Left Hemisph.	6	1618	508	8	1479	401	6	299	162	7	325	130
Right Hemisph.	6	1674	547	8	1536	385	6	347	156	5	303	142
Heart	6	3938	783	7	3441	471	8	22631	8176	7	22708	6517
Suprar. Gland	5	10256	2729	8	9595	3422	8	11004	5548	6	10996	7946
Small Intestine	6	11157	1430	7	9932	2258	6	5977	1834	8	4110	1122
Kidney	6	22696	3173	8	23541	4742	8	21514	8932	8	13555	14232
Liver	6	34641	3444	8	38130	11072	8	3799	950	7	2901	1892

ively the normal function of the organs. It is very possible that PHH plays an important role for the pathogenesis of the experimental traumatic brain oedema. Our data are in coordination with the reported positive effect of PHH upon haemorrhagic shock (Popdimitrov, Tomova — 1971), burning (Kozarov, Popdimitrov — 1978), atherosclerosis (Demireva — 1977).

The number of registered impulses of Rb-distribution is higher in the organs of experimental animals protected by PHH than that of the controls. High and approximate for both subgroups (experimental and control) values of activity in the heart is a probable result of intracardiac application of isotope and short period (45 sec) before killing of the animals. The same explanation (concerning the short period) is possibly valid for the low values of radiometered livers. Maybe the activity in this short time represents exclusively the nutritive part of their blood circulation.

No statistical difference between both isotope data of the studied experimental and control animals is established. It is very probably that this is a result of different-level distribution in each guinea pig for any of the experimental days and the dynamics of isotope assimilation and digestion (specially for M) which is not the same for various organs and periods (Popdimitrov, Tomova, Paskalev — 1971). It must be pointed that each experimental series covers two pairs of guinea pigs (one of each subgroup), subjected to same conditions, same periods of investigation (the animals are of very close physiological parameters).

The established data, though a tendency, are very similar to our previous conclusions (Popdimitrov — 1975) that the level of active organs' blood circulation is related to the level of PHH in the corresponding organs.

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РАСПРЕДЕЛЕНИЕ МЕТИОНИН, СЕЛЕНА^{75} И ^{86}РУБИДИЯ В ОРГАНАХ МОРСКИХ СВИНОК С ЭКСПЕРИМЕНТАЛЬНЫМ ОТЕКОМ МОЗГА, ПРОТЕКТИРОВАННЫХ БЕЛКОВЫМ ГИДРОЛИЗАТОМ

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РЕЗЮМЕ

Авторы изучают влияние белкового гидролизата, инъецированного протективно, интраперитонеально морским свинкам до экспериментально вызванного отека мозга. Животные оставались 3 дня на голодной диете. Отек мозга вызывался наложением сухого льда, прижатого в течение 5 минут к обнаженной коже, подкожным тканям и надкостнице костей черепной коробки животных.

Исследовано распределение метионин^{75}селена, инъецированного внутрибрюшинно за 3 часа до забоя животных и ^{85}рубидия (хлорида рубидия), инъецированного интракардиально через заранее канюлированную наружную яремную вену за 45 секунд до забоя животных. Морские свинки забивались в 24 часу после экспериментально вызваного отека.

Авторы делают заключение, что белковый обмен и кровоснабжение протектированных гидролизатом животных улучшается в результате лучшего распределения указанных изотопов в большинстве органов животных по сравнению с распределением в органах морских свинок, инъецированных физиологическим раствором.