

CONTENTS OF FAD (FLAVIN ADENINE DINUCLEOTIDE) AND TOTAL AMOUNT OFFLAVIN AT ALLOTRANSPLANTATION OF EMBRYONIC MUSCLE TISSUE AT RATS

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Abstract

The article presents the results of the determination of FAD and common flavin at allotransplantation of embryonic muscle tissue and determination of it without replanting. In this case, fetal tissue allotransplantation does not affect the number of common flavins. In the abdominal muscle tissue the number of common flavins increased during surgery without replanting. Number of FAD as at allotransplantation as during surgery without replanting increased in the femoral muscle of adult rat, therefore allotransplantation had no effect on the researching parameter. In the abdominal muscle tissue of adult rat at surgery without slackening, the amount of FAD did not happen any changes, but during allotransplantation of embryonic muscle tissue the amount of FAD increased, therefore it can be assumed that allotransplantation leads to increasing of FAD synthesis from riboflavin in the abdominal muscle tissue of adult rat.

Keywords: Allotransplantation, riboflavin, abdominal and thigh muscle tissue

Introduction

At the present time – researching of changes in the various biochemical processes during allotransplantation of embryonic tissues cause a great interest. Accumulated right to nowadays information and knowledge of the key biochemical reactions that provide vitamin metabolism processes gave us advantages in assessing the viability of the graft, and allows widely to characterize the degree of engraftment or death and uncover the mechanisms of biochemical graft adjustment [1]. The widespread use of embryonic tissues transplantation and cells in medicine to promote research a number of issues that relate to the determination of their influence on the course of various diseases and the study of metabolic flow at the processes in transplants. [2]

In this case, study of the fetal tissues metabolism has a dual purpose - on the one hand is to identify the biochemical characteristics of the vitamin metabolism of embryonic tissues, on the other - the definition of the metabolic relationships grafts and tissues of the recipient. [3]

The aim of this work was to investigate the processes of changes in the balance of riboflavin in muscle tissue before and after allotransplantation of embryonic muscle tissue and surgery without replanting.

Materials and researching methods

Experiments were carried out on the basis of the Biochemistry Department laboratory ONU I.I. Mechnikov. Allotransplantation was performed at white outbred rats - male,

weighing 180-360 g. In this research all requirements of the European Convention on the protection of animals that used for experimental purposes - were complied. Surgery was performed under sterile conditions. Source of fetal tissue were taken from embryos of adult pregnant rat females with gestational 3.5-4 weeks. The abdominal muscle tissue from embryos was removed and performed spiking to an adult homologous tissues of adult rat. A similar procedure was carried out with the thigh muscle tissue.

Operative (surgery) field was treated with Jodobac. Sutured tightly wound surface by a simple surgical suture. Impose a sterile bandage.

Method for determination of FAD and the total amount of flavin

Based on the method of determination of flavins by Yudenfreund our modification [4]. Statistical data processing was performed using Student's t test. [5]

Results and discussion

During determining the level of RF + PSK with allotransplantation of fetal tissue can be noted - a slight increasing of their number (amount) in the femoral muscle of adults right to day 7 of the experiment. In the femoral muscle of the embryo such results were observed at the 1st-3rd and right at the day of the experiment, also on the day 7, the monitoring indicator reached the reference value. In the abdominal muscle tissue of the embryo at 1st-3rd days after allotransplantation there was a slight increase of the RF + FMN amount and right today 7 was decreasing to control level. In the abdominal muscle tissue analyzed index decreased to the control values to the day 7 of the experiment. (Table. 1)

Table 1. Number (amount) of RF + FMN at allotransplantation of embryo tissue (mkg/g of tissue)

	Control without replanting	1 st day	3 rd day	7 th day
Femoral muscle of adult	10±2*	12±2	16±6	16±8
Femoral muscle of the embryo	8±2	8±2	12±2	8±2
abdominal muscle tissue of the adult rat	11±2	9±2	10±4	6±0,1
abdominal muscle tissue of the embryo	9±1	12±3	11±6	8±3

*P₁≤0,05 – significantly relative to the control

**P₂≤0,05 – significantly regarding the adult to embryo

Considering the results of the general amount of flavins research – we should note that in the formed muscle tissue at the first day of the experiment there was a slight increase, and on the 3rd and 7th days - decrease to baseline. In the abdominal muscle tissue amount of total flavins on day 1st increased slightly in both embryonic and in adult tissue, on the third and seventh day recorded rate decreased. (Table. 2)

Table 2. Number (amount) of RF + FMN + FAD at allotransplantation of embryo tissue (mkg/g of tissue)

	Control without replanting	1 st day	3 rd day	7 th day
Femoral muscle of adult	11±1	16±5	11±4	13±2
Femoral muscle of the embryo	9±2	15±5	9±3	6±1**
abdominal muscle tissue of the adult rat	10±2	13±2	8±2	9±1
abdominal muscle tissue of the embryo	9±1	12±2	8±2	10±3

*P₁≤0,05 – significantly relative to the control

**P₂≤0,05 – significantly regarding the adult to embryo

Number (amount) of FAD on the first day of the experiment in all researched tissues increased, and by the third days decreased from control values. By day 7, this figure exceeded the reference value in all studied tissues, except the femoral muscle of the embryo. (Table. 3)

Table 3.Number (amount) of FAD at allotransplantation of embryo tissue (mkg/g of tissue)

	Control withoutreplanting	1 st day	3 rd day	7 th day
Femoralmuscleofadult	4±1	8±4*	2±0*	10±5*
Femoral muscle of the embryo	3±1	12±6*,**	1±0*	2±0*,**
abdominal muscle tissue of the adult rat	2±1	7±2*	4±1*	4±1*
abdominal muscle tissue of the embryo	2±0	7±1*	2±0**	8±4*,**

* $P_1 \leq 0,05$ – significantly relative to the control

** $P_2 \leq 0,05$ – significantly regarding the adult to embryo

During the surgery without replanting fetal tissue there was a significant increase in the number (amount) of common flavins to day 7 studies from control values in the abdominal muscle tissue during surgery. (Table. 4)

Table 4.Number (amount) of common flavins without replanting (mkg/g of tissue)

	Control withoutreplanting	1 st day	3 rd day	7 th day
femoral muscle tissues	11±1	9±3	9±1	14±2
abdominal muscle tissues	10±2	12±3	6±1	16±1*

* $P_1 \leq 0,05$ – significantly relative to the control

Evaluation of RF + FMN during sham surgery demonstrated a reduction of this parameter on the third day of research relative to the control as in the femoral as in abdominal muscle tissues. (Table. 5)

Table 5.Number (amount) of RF + FMNwithout replanting (mkg/gof tissue)

	Control withoutreplanting	1 st day	3 rd day	7 th day
femoral muscle tissues	10±1	6±2	5±1*	9±1
abdominal muscle tissues	11±2	11±4	3±1*	10±2

* $P_1 \leq 0,05$ – significantly relative to the control

Determining the number of FAD, showed a slight decrease in its content at the third day of the experiment in the femoral and abdominal muscle tissue on the 7th day, the number of studies FAD increased significantly towards the control values. (Table. 6)

Table 6.Number (amount) of FAD during surgery without replanting (mkg/gof tissue)

	Control withoutreplanting	1 st day	3 rd day	7 th day
femoral muscle tissues	4±1	4±1	5±1	9±1*
abdominal muscle tissues	7±2	8±2	2±0,1	7±1

* $P_1 \leq 0,05$ – significantly relative to the control

Based on these results we can conclude that the fetal tissue allotransplantation results on the 1st and 7th day of the experiment to the accelerated formation of FAD RF + FMN, which is obviously due to the increasing of metabolic needs of the tissue after allotransplantation

Allotransplantation of fetal tissue not affected. In the abdominal muscle tissue the amount of common flavins increased during surgery without replanting. Number (amount) of FAD in allotransplantation during surgery without replanting increased in the femoral muscle of adults, therefore allotransplantation had no effect on the studied (researched) parameters. In the abdominal muscle tissue of adults during surgery without slackening any changes in the amount of FAD did not happen, and allotransplantation of embryonic muscle tissue amount of FAD increased, therefore it can be assumed that allotransplantation leads to increasing of FAD synthesis from riboflavin in the abdominal muscle tissue of adults.

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