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THE IMPACT OF IN VIVO ADMINISTRATION OF A SYNTHESIS PRODUCT (BY-PRODUCT OF SALICYLIC ACID) ON SOME BIOCHEMICAL PARAMETERS ON RATS

IMPACTUL ADMINISTRĂRII IN VIVO A UNUI PRODUS DE SINTEZĂ (DERIVAT AL ACIDULUI SALICILIC) ASUPRA UNOR PARAMETRI BIOCHIMICI LA ŞOBOLANI.

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The goal of this study is to establish the in vivo impact of a by-product of salicylic acid, 5-cloro-2-hidroxy-azotyl-sulfamoil-phenyl benzamyde synthesis product (5ClSA-SA), synthesized at the Technical University, Faculty of Industrial Chemistry of Timisoara, on some parameters of energetic metabolism. The experimental results shows that the synthesis product has induced a strong significant increase ($p<0.01$) of glycemia compared to tests, in direct relation with administration period and a fluctuation of cholesterol values with decrease followed by strong significant increase ($p<0.01$) compared to tests. Glycemia and plasmatic cholesterol values were situated between physiological limits. Triglycerides registered strong significant increases ($p<0.01$) in direct relation with administration period, over the physiological limits.
Key words: glycemia, cholesterol, triglyceride, rat

Introduction

The researches pursued the effect of in vivo administration of 5ClSA-SA synthesis product, which is amide of 5 chlorosalycilic acid with sulphanilamide on glycemia, cholesterol and triglycerides values.

Materials and Methods

The study was done on 28 Wistar rats, grouped in four batches: 2 test batches C_1 and C_2 and two experimental batches E_1 and E_2. To the experimental batches was intraperitoneally administrated 0.44 mg/kg m.c. of 5ClSA-SA for 5, respectively, 7 consecutive days. To the test batches was administrated the same quantities of distilled water (0.3 ml). The 5 ClSA-SA administrated dose had 1/10 DL_{50} salicylamide constituent.

Blood was sampling at 24h since the fifth administration from C_1 and E_1 batches, and at 24h since the seventh administration from C_2 and E_2 batches.

The determination of glucose, cholesterol and triglycerides was made on VET SCREEN tester.

Results and Discussions

Experimental results were statistic operated through ANOVA method and student test and are presented in tables 1, 2, 3 and graph 1.

Table 1

Average values of glycemia (mg/dL) on experimental and test groups.

Group	$\bar{x} \pm Sx$	D.S	Confidence level 95%
C_1	101.3 ± 0.88	3.23	3.97
C_2	99.86 ± 1.30	3.44	3.97
E_1	130.43 ±0.72*	1.90	3.97
E_2	136.43 ± 0.89*	7.55	3.97

*p < 0.01

Table 2

Average values of cholesterol (mg/dL) on experimental and test groups.

Group	$\bar{x} \pm Sx$	D.S	Confidence level 95%
C_1	61.00 ± 1.89	5.08	4.79
C_2	62.08 ± 1.94	5.13	4.79
E_1	47.71 ±0.81*	2.14	4.79
E_2	71.01 ± 1.80*	4.76	4.79

*p < 0.01

Table 3

Average values of triglycerides (mg/dL) on experimental and test groups.

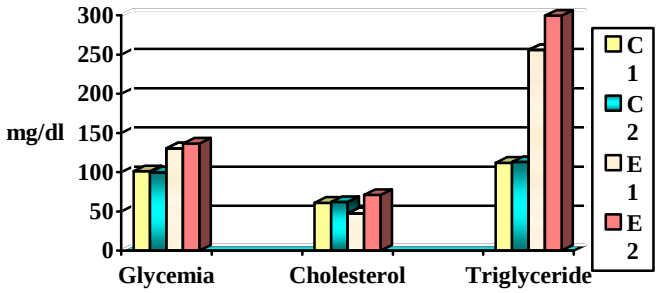
Group	$\bar{x} \pm Sx$	D.S	Confidence level 95%
C_1	112.08 ± 4.11	9.12	24.58
C_2	113.14 ± 3.53	9.34	24.58
E_1	255.86 ±5.63*	14.90	24.58
E_2	299.43 ± 9.91*	26.22	24.58

*p < 0.01

Glycemia values presented strong significant increases compared to test ($p<0.01$) (E_1/C_1 :+28.76%; E_2/C_2 : +36.62%) in relation with administration period, but not in direct ratio; the values was situated in physiological limits [10].

The differences registered between 5 and seven administration were not significant ($p>0.05$).

Studies done with by-products of salicylic acid, aspirin being one of them, show up that in high doses they can determine hyperglycemia and glucosury, this substances can declutch the oxidative phospfolirality [11, 12]. The administrated dose has determinate the glycemia increase without his values passing over the normal limits given by the literature [10].



Graph 1. Glycemia, cholesterol and triglycerides variation on experimental and test groups

The administration of synthesis product has induced the cholesterol values fluctuation, that registered decrease followed by the strong significant increase ($p<0.01$) compared to test (E_1/C_1: -21.78%, respectively E_2/C_2 :+14.5%), but in physiological limits [7,10]. Administration on rats of salicylamide (basis nucleus of synthesis product) has induces the decrease of cholesterol compared to test but in physiological limits (unpublished personal data), and in others experiments with sulfamidic derivatides, was registered an increase of plasmatic cholesterol concentration [3]. Carboxyl or hydroxyl groups substitution change the efficiency and toxicity od salicylates compounds [4].

Triglycerides values registered strong significant increases ($p<0.01$) compared to test (E_1/C_1: +128.28%; E_2/C_2: +164.65%) as all as to physiological limits [10]. Glucose excess favors the triglycerides synthesis and inhibited the fat acids release, the liver being involved in fat acids circle [11]. The liver is the main target of drugs toxicity, xenobiotics and oxidative stress. The oxidative stress is one of the important mechanisms of chemical hepatotoxicity [2]. Hepatotoxicity induced by 5ClSA-SA was confirmed by the increase of seric transaminases in the experimental studies done with this product [9]. Also have a short life, the reactive species of oxygen acts on all biologically active compounds: nucleic acids, proteins and amino acids, lipids, glucides [1, 2].

Conclusions

Administrated in vivo, the 5ClSA-SA synthesis product has determinate:

- The increase of glycemia values in direct relation with administration period and plasmatic cholesterol fluctuation, the registered values being situated in physiological limits;
- The strong significant increase ($p<0.01$) of plasmatic triglycerides compared to test and physiological limits.

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