THE EFFECT OF A NEW SALICYLIC ACID SYNTHESIS COMPOUNDS ADMINISTRATION ON SERUM TRANSAMINASIS

EFECTUL ADMINISTRAȚII UNUI DERIVAT NOU DE SINTEZĂ AL ACIDULUI SALICILIC ASUPRA TRANSAMINAZELOR SERICE

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The chemical synthesis product is the amide of chlorine salicylic acid and sulphanilamide (5CISA-SA). This research had as objective the effect of this product from salicylic acid class as a potential medicine on the serum transaminasis activity. 5CISA-SA has been administrated intraperitoneal to Wistar rats for 7 days consecutively determining ALT and AST transaminasis activities after 5 and 7 days. Serum transaminases had high values compared to the control sample (220% AST and 237% ALT).

This synthesis product can lead to stress that induces increasing of plasmatic enzymes activity, transaminasis being one of those.

Key words: rats, blood, transaminasis, salicylic acid compounds.

Introduction

Among unsteroidal and incendiary (NSAID) drugs the most popular is the salicylic acid, a common component in plants. It is used from century as traditional drug (at first as an acetate esther, then as aspirin). The salicylic acid is important for other pharmaceutical products production like salicylanilides compounds [3].

In general, the salicylats act thru the properties of salicylic acid which is included in these compounds. Carboxyl or hydroxyl groups’ substitution changes the efficiency or toxicity of salicylat compounds [8]. The aim of this study was to determinate the effect of a new synthesis product, salicylic acid compound, on the seric aminotranspherases activity.

Materials and Methods

The experiment was carried out on three months old Wistar rats divided into three batches: a control (C, n=7) and 2 experimental batches (E1 and E2 with equal number of gentries: n=5). To the experimental batches solution with 0.44 mg 5CISA-SA/g m.c./day was administrated intra-peritoneum, for 5 days consecutively (E1) respectively 7 days consecutively (E2) as for the control batch, the same quantity of
distilled water was administrated. Because for the new synthesis product was not determinate DL_{50}, the 5ClISA-SA dose was calculated so that 0.44 mg – salicylic compound’s nucleus which is included in his structure – to be in amount of 1/10 DL_{50} salicylanylid.

Blood samples were taken from the cord as follows: at the begining of 3 controls, in 24 hours after the 5th administration from E_1 and one rat in control sample, in 24 hours after the 7th administration from E_2 and another 3 rats in control sample. Were determinates the aminotranspherasys: alanin aminotransferasys (ALT) and aspartat aminotranspferasys (AST) with Coulter Maxm Beckman Hematology Automatic Analyzer.

Results and discussion

The obtained results are presented in tables 1, 2 and graphs 1, 2.

Mean values of aminotranspherasys AST and ALT

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>E_1</th>
<th>E_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST U/I</td>
<td>55±2.15</td>
<td>146±6.53</td>
<td>176±4.35</td>
</tr>
<tr>
<td>ALT U/I</td>
<td>31±0.22</td>
<td>60.6±3.09</td>
<td>73.5±1.39</td>
</tr>
</tbody>
</table>

Graph 1

Mean values of aspartat aminotranspherasys AST
Analyzing the results obtained during this study, an increase of aminotranspherasy can be observed (table 1).

AST values, after new synthesis product administration, have increased after 5 administrations with 165% and at 24h after 7th administration with 220% compared to control.

ALT also increased with 95.5% at 24h after 5th administration compared to control, respectively with 237% at 24h after 7th administration. At control, AST and ALT values were in normal limits after some authors [9, 12] and were different after others [1, 5, 10].

The amplest medical practical application has ALT and AST aminotranspherasy. The aminotranspherasy releases depend on the hepatocytes enzymatic spectrum and their capacity of synthesize proteins [11]. AST: ALT ratio represent DeRittis coefficient. In humans, it is 1.3. Because 89% of ALT is in cythosol, the enzyme activity increase in serum faster and longer under noxys acute action (DeRittis coefficient became proper fraction). In hypercritical or longer lesions prevail the AST enzyme release (DeRittis coefficient is inverted)[3].

Our AST enzyme increase has taken to an DeRittis coefficient of 2.39 which revealed a liver affection determinate either by the administrated substance or by the products of metabolism that can induce toxically effects. Hepatotoxicity was indicated by the AST activity increase from plasma and the liver severs necrosis [4].
The liver – a complex organ with multiple functions – is the most important target of drugs toxicity, xenobiotics and oxidative stress. Hepatotoxicity remains the major cause which determines the retreat of clinically used drugs [2].

The AST increase can be inducted by hemolytic diseases and hemolysis. The study regarding the eritrocitary membrane fragility as a consequence of the impact administrating the 5ClISA-SA product has confirmed a possible hemolitically effect of the new synthesis product (paper in course of publication).

Aminotranspherasys increase in and under the toxic effect of some drugs, but some of them so called “transaminit” (as in seric hyperactivity without morphological sublayer and known cause) that needs a careful investigation [11].

Conclusions

Amide of 5 chlorsalicylic acid with sulfanilamide has determinate the semnificative increase of AST and ALT aminotranspherasys activity.

The DeRittis coefficent increase due to higher aspartat aminotranspherasys values indicate possible hepatics affection, induced by the new synthesis product.

The highest value of DeRittis coefficent was registered at 5ClISA-SA administration, during the entire experiment which can indicate possible liver affection.

Bibliography


Cuvinte cheie: șobolani, sânge, aminotransferaze, derivați ai acidului salicilic.