THE EFFECT OF GLUTATHIONE, VITAMINS B_{12} AND B_{1},
AND RUTIN ON THE LEVEL OF CHOLESTEROL IN THE
BRAIN, LIVER AND BLOOD IN ALIMENTARY
HYPERCHOLESTERINEMIA

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In the light of existing data on the effect of lipotropic substances on cholesterol content in the blood in
atherosclerosis [1, 2, 3], as well as data on glutathione inhibition of lipid accumulation in the liver in experi-
mental hypercholesterinemia [4], we undertook to study the effect of vitamins B_{1} and B_{12}, rutin, and glutathione
as well on the cholesterol content in organs of chicks with experimental hypercholesterinemia.

EXPERIMENTAL METHOD

Two series of experiments were carried out on 286 12-day-old chicks. In each series they were sub-
divided into 8 groups. The first group were controls; their diet consisted of wheat porridge supplemented with
2.5% sunflower oil and green grass. The chicks of the remaining 7 groups received wheat porridge supple-
mented with sunflower oil containing 2% cholesterol and green grass for 18 days. The amount of food eaten
and the food remaining were registered every day. At the time of the experiment each chick had received at
least approximately 4.7 g cholesterol.

After 18 days, feeding with cholesterol was stopped and the degree of hypercholesterinemia was determined
in part of the experimental chicks.

Subsequently, the second group received the usual ration. Two γ of vitamin B_{12} (first series) and 0.1 γ
vitamin B_{1} (second series) were injected subcutaneously daily in chicks of group 3. Rutin was added to the diet
of group 4 chicks at a level of 100 mg/kg weight daily. In addition to rutin, group 5 chicks were subcutaneously
injected with glutathione at a level of 12.5 mg/100 g weight. Group 6 chicks were injected subcutaneously with
0.2 mg vitamin B_{1}, group 7 with a solution of glutathione (12.5 mg/100 g weight) and group 8 with vitamin B_{1} and
glutathione in doses indicated above. Chicks in the first series received the preparations described above for 15
days, part of the chicks in the second series for 10 days, and the remainder for 20 days after cessation of choles-
terol feeding.

At the end of the injection period the chicks were decapitated, the liver and brain removed, these organs
were weighed and dried in a thermostat at 105° to a constant weight. The organs were ground into powder, ex-
tracted with ether in a Soxhlet apparatus for 2 days. Cholesterol was determined in the ether extracts of liver
and brain with a colorimetric method based on the Liebermann-Burchard reaction. The cholesterol content in
the blood of the chicks was simultaneously determined.
Content of Cholesterol in Blood, Liver and Brain of Normal Chicks and Chicks Fed Cholesterol and Injected with Glutathione and Vitamins B₂₂, B₁, and Rutin under Conditions of Hypercholesterinemia (average data)

<table>
<thead>
<tr>
<th>Group</th>
<th>Experimental conditions</th>
<th>Number of chicks</th>
<th>Concentration of cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>after cessation of cholesterol feeding at</td>
<td>in blood (in mg %)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 days</td>
<td>15 days</td>
</tr>
<tr>
<td>First</td>
<td>Control</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Second</td>
<td>After feeding cholesterol + ration</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Injection under conditions of hypercholesterinemia:</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Third</td>
<td>Vitamin B₂₂</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Fourth</td>
<td>Rutin</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Fifth</td>
<td>Rutin + glutathione</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Sixth</td>
<td>Vitamin B₁</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Seventh</td>
<td>Glutathione</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Eighth</td>
<td>Vitamin B₂ + glutathione</td>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>