EFFECT OF “STIFLOS” MEDICATION ON THE BLOOD HEMOSTASIS IN MODEL OF ALIMENTARY MODEL

The studies have revealed hypocoagulation in rabbits having experimental alimentary anemia. The use of preparation Stiflos in dose 100 mg/kg in experimental alimentary anemia provided normalization of blood coagulation. The paper suggests using antianemia therapeutic agents in treating the alimentary anemia, as well as simultaneous receiving of hemostatics for normalization of the blood coagulation state.

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Introduction

Hemorrhage is one of the hazardous complications in different diseases and states of human health, particularly in surgery, in obstetrics pathology, in the otorhinolaryngology, in infectious diseases, in anticoagulant overdose, as well as in disseminate intravascular blood coagulation (Repina, 1986; Plotkin and Povarichina, 2004). The problem of the hemorrhage stopping was and remains extremely important in the clinical practice.

At the same time it should be noted that the existing arsenal of hemostatic agents of the general and local effect cannot be considered as satisfactory as many hemostatic preparations along with favorable outcome induce unfavorable influence related to either toxic or adverse effects of these preparation. Therefore, along with synthetic preparations in some types of hemorrhages there have been used some drug preparation such as nettle, Achillea filipendulina, Capsicum annuum L., viburnum, arnica, Lagochilus, and others (Sokolov, 2000; Ladigina, 1991).

Taking into account the above-mentioned in Tashkent Pharmaceutical Institute there have been developed tablets from dry extracts of Achillea filipendulina and Styli cum stigmatis Zeae called “Stiflos”. The literature data about the state of blood coagulation in anemia are scant and contradictory. In the available literature we did not find reports devoted to studying of the blood coagulation system in alimentary anemia that seems to be the most prevalent form of anemia in our region at present time.

The purpose of investigation was to study blood coagulation in experimental alimentary anemia and method of its correction with preparation stiflos.

Materials and methods

Alimentary anemia is induced according to the methodical recommendations of the Pharmacological Committee of the Ministry of health of the Russian Federation on rabbits. They received protein-free and low-vitamin diet and fresh cabbage 50g every day for 10-15 days. Retraction of the blood clot in the rabbits was measured with I.Hirchboesk method modified by M.Kotovshinova and Z.Bleksmit. The state of the blood coagulation was evaluated by the time of blood coagulation by I.Lee and P.O.White with use of thromboelastograph (Baluda, 1980; Baluda, 1970).

Results

It was shown that in alimentary anemia the number of thrombocytes reduced from 375± 28 to 217.2± 13.0 thousand. Under effect of stiflos there was noted reliable increase in number of thrombocytes beginning from the 10th day of study achieving 435± 21.5 thousand to the 30-th day
of the experiment (Figure 1). In the mechanism of blood coagulation not only the amount of thrombocytes but also their traction effect has important role. The results showed that initial retraction was 19± 1.4 min., and in anemia - 40± 1.0 min, i.e. time was twice increased (Figure 1). In cases of use of Stiflos in anemia during 10 days the time of retraction shortened from 40±4.0 min. to 23± 2.5 min, i.e. by 57.5%; 20 and 30 days later the parameters of retraction decreased on the average by 52.5% and 42.5% in comparison with anemia. After stopping of stifles administration in 15 days, i.e. on the 45 day of experiment, the retraction time was on the average 21± 2.0 min that was practically correlated to the initial values.

**Figure 1. Effect of Stiflos on the thromocyte number (1) and on the retraction of blood clot (2) in alimentary anemia**

![Figure 1](image1.png)

**Figure 2. Effect of Stiflos on the time of blood coagulation (SEC) in experimental alimentary anemia**

![Figure 2](image2.png)
There was studied change of the general blood coagulation by parameters of the time of spontaneous coagulation of the whole blood in order to characterize hemostatic effect of stiflos on the blood coagulation system. Initial time of the whole blood coagulation was 342±25 sec., while in alimentary anemia it was made longer by 40% (P<0.05). The use of stifles for 10 days resulted in shortening of the time of blood coagulation by 49.8%, for 20 days - by 31% and 30 days later - by 30% in relation to anemia. After stopping of stifles receiving during 45 days the time of blood coagulation remained still increased by 23% in comparison with initial level (Figure 2).

In order to obtain more objective, full and reliable information about the state of hemocoagulation we studied effect of this preparation on the parameters of thromboelastogram.

Thromboelastograph parameters obtained in experimental alimentary anemia showed that blood coagulation has the character of hypocoagulation. Thus, coagulation time of the constant R, reflecting velocity of thromboplastin production, lengthened by 62%, K - time of clot production lengthened by 63%, thromboelastograph constant R/K, showing use of prothrombin by thromboplastin, increased by 3.2%.

Nonspecific constant of coagulation (R+K), expressing general duration of blood coagulation, lengthened by 62.7%. There was observed decrease in maximum amplitude MA - by 82% and clot elasticity E - by 65.8% and index coagulation Ci reduced by 50% (Table 1).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>TEG, mm</th>
<th>Intact</th>
<th>Anemia</th>
<th>After administration of preparation in:</th>
<th>After stopping of preparation use:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10 days</td>
<td>20 days</td>
<td>30 days</td>
<td>15 days</td>
</tr>
<tr>
<td>R, mm</td>
<td>38.8±2.8</td>
<td>63±3.5</td>
<td>50±3</td>
<td>56±4.6</td>
<td>37±3.8</td>
</tr>
<tr>
<td>K, mm</td>
<td>19.6±1.6</td>
<td>32±2.3</td>
<td>24±1</td>
<td>29±3</td>
<td>15±1</td>
</tr>
<tr>
<td>MA, mm</td>
<td>58.6±1.2</td>
<td>48±5</td>
<td>70±3.3</td>
<td>70±3.5</td>
<td>66±3.3</td>
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<tr>
<td>T, mm</td>
<td>115±12</td>
<td>92.3±4.5</td>
<td>110±10</td>
<td>120±11</td>
<td>115±10</td>
</tr>
<tr>
<td>T, mm</td>
<td>200±16</td>
<td>177.3±15</td>
<td>183±15</td>
<td>185±9.5</td>
<td>132±12</td>
</tr>
<tr>
<td>S, mm</td>
<td>134.6±13</td>
<td>124±11</td>
<td>134±12</td>
<td>149±15</td>
<td>130±12</td>
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<tr>
<td>E</td>
<td>141.5±14</td>
<td>93.2±4.6</td>
<td>269±22</td>
<td>233±21</td>
<td>235±10</td>
</tr>
<tr>
<td>Ci</td>
<td>1±0.1</td>
<td>0.5±0.1</td>
<td>0.9±0.1</td>
<td>2.3±0.2</td>
<td>1.3±0.1</td>
</tr>
<tr>
<td>R+K, mm</td>
<td>58.4±6.2</td>
<td>95±5</td>
<td>74±3</td>
<td>78±3</td>
<td>52±5</td>
</tr>
<tr>
<td>R/K</td>
<td>1.9±0.2</td>
<td>1.96±0.4</td>
<td>2±0.2</td>
<td>1.9±0.2</td>
<td>2.4±0.2</td>
</tr>
</tbody>
</table>

Note: * - reliability in relation to anemia in P<0.05

Thus, the data obtained indicated about reduction of blood coagulation in alimentary anemia. The preparation Stiflos administered orally every day for 30 days induced increased blood coagulation (Table 1).

Thus, on the 10, 20, and 30 day of study R shortened by 20.7%; 12%; and 42% respectively in anemia. Maximal effect in relation to velocity of production of thromboplastin was observed to the 30 day of study. After 10, 20 and 30 days constant K decreased by 25%; 9.4%; 53% respectively in anemia. Fifteen and forty five days after stopping of preparation receiving constant R and velocity of clot formation correlated to initial values. The constant MA in comparison with control increased by 45.8% achieving maximum on the 30 day and decreased by 37.3% after stopping of preparation use in anemia. Elasticity of E clot beginning from the 10th day of study increased in comparison with the initial level. Finally, the initial value was topped in 10, 20 and 30 days by 90%, 64.6% and 66% respectively; after stopping of preparation receiving in 15, 45 days it came nearer to initial data (Tabl.1). Coagulation constant Ci increased in 10, 20 and 30 days by 80%, 360%, and 160% respectively in comparison with anemia, and after stopping of preparation it correlated to initial level.
Conclusion

The thromboelastographic parameters, thrombocyte numbers, retraction time and blood coagulation time obtained in experimental alimentary anemia showed that blood coagulation was the type of hypocoagulation. The use of pharmaceutical agent Stiflos during 30 days at the anemia caused decrease in blood coagulation time and retraction time by 49.9-57.5% maximally. Moreover, there was found increase in thromboelastic parameters in comparison with anemia. The drug Stiflos administered orally every day for 30 days induced increased blood coagulation process.

Thus, the results obtained indicated that blood coagulation reduces in alimentary anemia and use of Stiflos provides the restoration of the process of blood coagulation

References


