Haemostatic Effect of Leaves of Two Plants: A Preliminary Study

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ABSTRACT

The effects of leaves of two plants Plectranthus mollis and Salvia officinalis on bleeding time in rats and the blood clotting time in man were studied. Both the plants markedly shortened both the bleeding and clotting time indicating that there could be some basis for the claim that the hydroalcoholic extracts of P. mollis and S. officinalis has haemostatic properties. Haemostasis is a lifesaving process and therefore exploration of compound that facilitate the process is of medicinal importance.

Key words: Haemostasis, Bleeding time, Clotting time, P. mollis, S. officinalis

INTRODUCTION

Nature has provided a complete storehouse of remedies to cure all ailments of mankind. The knowledge of drugs accumulates over thousands of years as a result of man’s inquisitive nature so that today we possess many effective means of ensuring health care. Many researches have shown that plants and its products have high potential to arrest bleeding.

The family Lamiaceae contains several genera such as Sage (Salvia), Basil (Ocimum) and Mint (Mentha) with a rich diversity of ethnobotanical uses. Another important genus is Plectranthus, a large genus containing about 300 species, found in Tropical Africa. Leaves of Plectranthus mollis used in Chota Nagpur to stop bleeding, as febrifuge and as mosquito repellent [1]. The chloroform extract of leaves showed anti-inflammatory activity and hydroalcoholic extract showed antioxidant [2]. The genus Salvia includes about 700 species spread throughout the world and Salvia officinalis L is native to Mediterranean region. The infusion and decoction of the leaves have been used as nerve tonic, digestive, antispasmodic, anti-inflammatory and antihaemorrhagic in Indian traditional medicine [3]. It contains tannic acid, rosmarinic acid, chlorogenic acid, caffeic acid, steroids, flavones and flavonoid glycosides [4].

Despite their use as antihaemorrhagic, no study has been conducted so far on the haemostatic properties of the plant. Hence the objective of the present study is to investigate the effect of hydroalcoholic extracts of P. mollis and S. officinalis on bleeding and clotting time in rats and human blood.

MATERIALS AND METHODS

Preparation of extracts: Powdered leaves (50 g each) were defatted with petroleum ether at 60-80º C followed by extraction with 300 ml of 70% ethanol using Soxhlet apparatus for 5-6 hr. The extracts were collected and the solvents were evaporated to get 2.0 g and 3.2 g for P. mollis and S. officinalis respectively.

Experimental animals: Young and healthy wistar rats of either sex, weighing between 200-250 g were used for the study. The animals were housed in clean cages and were provided food and water ad libitum during the experiment. The experimental protocol followed the Principles of Laboratory Animal Care and was approved by the Local Ethical Committee for Animal Experimentation, Sri Adichunchanagiri College of Pharmacy, B.G. Nagar.
Intrinsic, X, XI & XII) time tic plugs are formed due necessary for initiation of tissue repair. This was repeated using and the time bleeds (hydroalcoholic extracts) was 472.5 ± 16.5 seconds for P. mollis and S. officinalis respectively. There was significant reduction (p < 0.05) of clotting time in the presence of both the extracts and bleeding time uniformly in the blood samples and it can be concluded that both the plants possess haemostatic activity, thus affecting haemostasis [12]. The decrease in blood coagulation time could be due to an increase in one or more of the several clotting factors involved in the intrinsic pathway. The significant reduction in bleeding time concluded that the hydroalcoholic extracts of both the plants has positive effect in haemostasis possibly by acting on the integrity of blood vessel or involvement of platelets forming the haemostatic plug or both. Haemostasis is a lifesaving process and therefore exploration of compound that facilitate the process is of medicinal importance.

DISCUSSION

Haemostasis is a protective physiological mechanism which involves the arrest of blood loss at the site of injury by formation of a haemostatic plug and necessary for initiation of tissue repair processes and prevention of death of tissues through haemorrhage or thrombosis [7]. It involves three processes: vasoconstrictive effect of blood vessels, platelet response and blood clotting. A fourth process occurs when the clot is dissolved following repair of blood vessel [8]. Blood clotting occurs in the blood which ooze out of the blood vessel (extrinsic clotting) as well as within the occluded vessel by vasospasm [9]. (Intrinsic clotting) and the haemostatic plugs are formed due to extravascular as well as intravascular clots, respectively. Bleeding time evaluates the vascular and platelet responses with haemostasis [10], whereas the clotting time measures the intrinsic clotting factors (I, II, V, VIII, IX, X, XI & XII) [11].

Clotting time test is a qualitative measurement of factors involved in the intrinsic pathway which is carried out when there is deficiency, for example, deficiency of factor VIII, which causes haemophilia. Increase in clotting time thus signifies these deficiencies in coagulation. In the present study, the ethanolic extracts of the leaves of both P. mollis and S. officinalis reduce both clotting time and bleeding time uniformly in the blood samples and it can be concluded that both the plants possess haemostatic activity, thus affecting haemostasis [12]. The decrease in blood coagulation time could be due to an increase in one or more of the several clotting factors involved in the intrinsic pathway. The significant reduction in bleeding time concluded that the hydroalcoholic extracts of both the plants has positive effect in haemostasis possibly by acting on the integrity of blood vessel or involvement of platelets forming the haemostatic plug or both. Haemostasis is a lifesaving process and therefore exploration of compound that facilitate the process is of medicinal importance.
Table 1: Haemostatic effect of leaves of two plants

<table>
<thead>
<tr>
<th>S.No</th>
<th>Plants</th>
<th>Parameters</th>
<th>Control</th>
<th>Extracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>P. mollis</em></td>
<td>Clotting time (sec)</td>
<td>472.5 ± 16.5</td>
<td>40.8 ± 3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bleeding time (sec)</td>
<td>191.9 ± 10.4</td>
<td>17.1 ± 0.5</td>
</tr>
<tr>
<td>2</td>
<td><em>S. officinalis</em></td>
<td>Clotting time (sec)</td>
<td>475.2 ± 14.2</td>
<td>42 ± 4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bleeding time (sec)</td>
<td>188.5 ± 12.5</td>
<td>8.7 ± 0.8</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± S.E.M. \( p < 0.05 \)

REFERENCES