SHILAJIT IN MANAGEMENT OF IRON DEFICIENCY ANAEMIA
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Abstract
The Shilajit as a dietary supplement was examined for iron deficiency anaemia in experimental animals. In this study diet induced and bleeding technique were used to evaluate the iron deficiency anaemia. In diet induced, low iron diet from sigma and in bleeding technique bled 2ml of blood from each animal for 5 alternative days was used to induce iron deficiency anaemia (IDA), the animals which did not developed anaemia i.e. haemoglobin level < 9g/dl, were rejected and replaced with new animals. The Shilajit 500 mg/kg shows significant (p<0.01) increase in Hb, RBC & PCV values in both the model. According to our results Shilajit in doses of 500 mg/kg reveals anti-anaemic activity.

Key words: Shilajit, iron deficiency anaemia, haemoglobin, bleeding technique & low iron diet.

Introduction
Anaemia is a decrease in number of red blood cells (RBCs) or less than the normal quantity of hemoglobin in the blood. Anemia is estimated to affect nearly two thirds of the pregnant women in developing countries[1].Iron deficiency anemia is responsible for 95% of the anemias during pregnancy[2-3], [(Breymann C) (Yaqoob N), 2002]. In underdeveloped countries, anemia is a major contributory factor to maternal morbidity and mortality[4]. Shilajit, a traditional medicine has been used for cardioprotective, anti-asthmatic, anti-diabetic, hepatoprotective, anaemic and potent CNS activity for ages[5]. In the Charak Samhita, Shilajit is described as a product of four minerals: gold, silver, copper and iron, whereas Susruta Samhita included two more minerals, lead and zinc in its composition[6]. The present study has been designed to evaluate the anti anaemic activity of shilajit in bleeding and diet induced IDA model in rats. The drug has been able to raise the Hb. to satisfactory level when used in severely anemic iron deficient in rats.

Materials and Methods
Shilajit Dose Determination
The dose of shilajit was determined by acute toxicity study. As per OECD 425 guidelines the acute toxicity study was studied and it was found that the LD50 is 5000 mg/kg body weight. The effective dose calculated from one by tenth of the LD50 (500mg/kg).

Animal experiments
The animal experimental protocol was approved by Institutional Animal Ethical Committee as per the guidance of the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) 117/99/kvcp.

Iron deficiency model
Bleeding Induced IDA
This test was followed by the method described by McCance, R. A., 1937 with some modifications. In the model a total of 18 rats were divided into three groups of six each. The Group II &III rats were rendered Anemia by removing 2ml of blood from retro orbital plexus of each rat for 5 alternative days. Group III rats were treated with Shilajit 500mg/kg/day from the11th day after conforming anemia to 20th day from the initial bleeding. The blood samples were collected on 21st day for estimating the hematological parameters.

Low Iron Diet Induced IDA
Three groups of six rats each were used for study. Group I was maintained on normal rat diet, whereas Group II & III were maintained on an iron deficient diet.[7-8], for 13 days before study. The diet was served in porcelain dishes. The rats were fasted 1 day before study and Shilajit was administered to Group III rats, 14 days after beginning the iron-deficient diet upto 20th day. The blood samples were collected at the end of the 20th day for estimating the hematological parameters.

Results
Bleeding induced IDA
Shilajit significantly increased the level of Hb, HCT and RBC against the anaemia induced by bleeding. The values are shown in the Table 1.

Low iron diet induced IDA
Results (Table 2) revealed that Shilajit shows the significant (p < 0.01) anti-anaemic activity at dose of 500mg/kg.

**Table 1: Effect of Shilajit on bleeding induced IDA**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Hb g/dl</th>
<th>HCT %</th>
<th>RBC x10^6/mm^3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal control</td>
<td>18.18±0.4453</td>
<td>54.65±0.4696</td>
<td>8.96±0.3504</td>
</tr>
<tr>
<td>Induced control</td>
<td>8.2±0.2460</td>
<td>23.85±0.2997</td>
<td>5.46±0.2305</td>
</tr>
<tr>
<td>Shilajit 500mg/kg</td>
<td>15.3±0.2217</td>
<td>45.16±0.6344</td>
<td>8.73±0.3630</td>
</tr>
</tbody>
</table>

Values are in mean ±SEM; (n=6), ** p<0.01 vs. induced control

**Table 2: Effect of Shilajit on low iron diet induced IDA**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Hb g/dl</th>
<th>HCT %</th>
<th>RBC x10^6/mm^3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal control</td>
<td>15.78±0.353</td>
<td>45.95±0.84</td>
<td>8.85±0.28</td>
</tr>
<tr>
<td>Induced control</td>
<td>7.90±0.12</td>
<td>23.91±0.60</td>
<td>5.33±0.23</td>
</tr>
<tr>
<td>Shilajit 500mg/kg</td>
<td>12.81±0.45</td>
<td>45.95±0.84</td>
<td>7.16±0.14</td>
</tr>
</tbody>
</table>

Values are in mean ±SEM; (n=6), ** p<0.01 vs. induced control

**Discussion**

The Shilajit’s increased the Hb, HCT and RBC when assessed using the bleeding model and in low iron diet induced model. About 1 mg of iron is lost each day through sloughing of cells from skin and mucosal surfaces, including the lining of the gastrointestinal tract[9]. Menstruation increases the average daily iron loss to about 2 mg per day in premenopausal female adults[10]. The iron depletion leads to Hb deficiency. Hemoglobin (found inside RBCs) normally carries oxygen from the lungs to the tissues, anemia leads to hypoxia (lack of oxygen) in organs, because all human cells depend on oxygen for survival. Shilajit containing iron, when taken as a dietary supplement it increase the haemoglobin level and it neutralizes the regular loss and during menstruation. Hence the present study shows that Shilajit exhibited activities in various degrees against both models of IDA.

**Conclusion**

In conclusion, this study has shown that the Shilajit having significant anti-anaemic activity in both model. Our data obtained from the present study suggest that the Shilajit can be taken as a dietary supplement in the management of iron deficiency anaemia.

**References**