Therapeutic role of Alfagin in recovering Iron Deficiency Anaemia (IDA)

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Abstract

Objective: To investigate the therapeutic role of Alfagin in recovering Iron deficiency Anemia (IDA).

Materials and Methods: The proposed study was a cross-sectional experimental animal study which was mainly conducted at the department of Pharmacology, University of Karachi- Pakistan from June to December 2022. The study was approved by the Ethical Review Board (ERB) of the concerned institute. A total of nine white rabbits (male/female) with prior iron deficiency of either sex, weighing approximately 1.8-2.0 Kg were randomly selected and divided into three groups such that Group 1 was the control group which received Normal Saline (N.S) orally (with respect to volume/weight) for 60 days. While, Group 2 was the group that was provided with the normal dose of Alfagin (i.e., 0.25ml/Kg) for 60 days. Whereas, Group 3 animals were fed with the high dose of Alfagin (i.e., 0.5ml/Kg) for 60 days. Data was analyzed by measuring the variable's hematological parameters along with their statistical difference using SPSS Version 20.0. The 95% confidence level of significance was attained while keeping the Pvalue <0.005.

Results: As per the observation, rabbits of group 3 showed maximum response i.e., statistically high significance (i.e., 10.23±0.258 S.E.M; P<0.005) as compared to the control group (i.e., 8.56±0.19 S.E.M) when given high dose of Alfagin (0.5ml/Kg). The significant increase in

hematological parameters i.e., hemoglobin, and RBCs shows the therapeutic role of Alfagin in treating Iron deficient Anemic (IDA) animal models.

Conclusion The herbal formulation Alfagin (which consisted of eluthrococcus senticoccus, Medicago sativa, Embilica officinalis, and Trigonella foenum graecum) can help in treating Iron deficiency anemia (IDA) by increasing the amount of Haemoglobin and RBCs to supply oxygen which can subsequently use to decrease the global burden of Anemia, annually.

Keywords: Alfagin, Anemia, Iron, hemoglobin, RBCs.

1. INTRODUCTION

The extracts of plants have been used traditionally from ancient times to treat multiple diseases. The extracts can be formulated as tablets, capsule or syrup depending upon its dosage, route of administration, target organ and mode of action (1). The ethnomedicine or phytoremediation is preferred over allopathic medicine due to the fact that it provides safer and cheaper treatments with less or no adverse effects when in returns offering a good substitute to any kind of infection be it bacterial, parasitic, algal or fungal infections (2,3).

Alfagin is an herbal formulation rich in bioactive compounds. Unlike of other synthetic preparations, Alfagin does not contains any artificial chemicals. Alfagin is composed of four therapeutic herbs i.e., eluthrococcus senticoccus, Medicago sativa, Embilica officinalis, and Trigonella foenum graecum which are commonly known as Ginseng, alfalfa, Embilica myrobalan, and fenugreek, respectively (4). Alfagin has adaptogenic properties due to which it can be used as muscle relaxant to relieve the stress and strain. It increases the utilization of oxygen and alters its metabolism within the body. Alfagin has many beneficial therapeutic aids, for instance it promotes the self-tolerance against infectious agents and simultaneously helps in alleviating the adaptive immune responses by concurrently fasten the process of healing and recovery. Moreover, the important constituent of Alfagin i.e., Ginseng has anti-depressant properties which helps in combating the cognitive and psychological problems like depression, stress, anxiety, psychosis, insomnia etc. (5)

Anemia or Iron deficiency Anemia (IDA) in particular is one of the leading causes of nutrition related diseases throughout the world. The situation is worse in Eastern Mediterranean Regions (EMR). So much so that approximately 15-48% population has been suffering from severe anemia in the Gulf countries and the high percentage of which belongs to the child-bearing age (6). The use of natural compound driven medicinal formulation i.e., Alfagin which consisted of Embilica officinalis has the ability to increase the red blood corpuscles (RBCs) in the animal model of anemia (when used in optimized quantity) (7). This subsequently increases the proportion of hemoglobin because the more the generation of RBCs, the more will be the transport of oxygen to different cells, tissues, and organ of the organism. Therefore, the aim of this experimental animal study is to evaluate the therapeutic role of Alfagin in recovering iron deficiency especially in anemic patients. (8)

2. MATERIALS AND METHODS

Study Design: The proposed study is a cross-sectional experimental study

Study Setting: It was designed and initiated at the department of Pharmacology, University of Karachi- Pakistan from June to December 2022. The study was approved by the Ethical Review Board (ERB) of the concerned institute.

Sample Size: A total of nine white rabbits with prior iron deficiency of either sex, weighing approximately 1.8-2.0 Kg were selected and divided into three groups such that;

- Group1= Control group received Normal Saline (N.S) orally (w.r.t. volume/weight) for 60 days
- Group 2= The group followed by the normal dose of Alfagin (i.e., 0.25ml/Kg) for 60 days
- Group 3= The group followed by the high dose of Alfagin (i.e., 0.5ml/Kg) for 60 days

The study models were selected based on gender, age, weight, specie classification, and ad libitum conditions. At each phase, the 7cm3 blood sample was drawn from the experimental subjects at the time intervals of 30th day and 60th day cycles followed by the prescribed respective dose to

test the difference in hematological parameters. The statistical analyses of data have been done by the help of SPSS Version 20.0, where the level of significance was kept at 95% confidence.

3. RESULTS

Table 1 shows the comparison of hematological parameters following administration of Alfagin Syrup in Normal dose and High Dose i.e., 0.25ml/Kg and 0.5ml/Kg twice a day for a period of 60 days where total number of experimental anima models are nine i.e., (n=9)

Whereas, Table. 2 indicates the statistically significant Comparison using Chi-Square test of different oral combinations among three different groups (control group, normal dose fed group and high dose fed group) to the experimental rabbits where $P<0.005$ by applying SPSS version 20.0.

Table. 1: Comparison of Hematological Parameters following Administration of Alfagin Syrup in Normal and High Dose for 60 days (n=9)

Parameters	Measurement Unit	Animal groups		
		Control	Alfagin (Normal Dose)	Alfagin (High Dose)
Hemoglobin	mg/dL	8.56±0.19	10.09±0.22**	10.23±0.258**
RBC	$x10^6$/c.mm	4.22±0.22	4.74±0.20	4.90±0.13*
WBC	$x10^3$/c.mm	5.08±0.37	5.87±0.28	6.34±0.49
Platelets	$x10^5$/c.mm	1.02±0.07	1.05±0.07	1.27±0.11

Average values ± S.E.M

*P<0.05 significant as compared to control

**P<0.005 highly significant as compared to control.

Chi-square test was applied.

Table. 2: Statistical Comparison using Chi-Square test of different oral combinations among three different groups (Group1, 2, 3) to the experimental rabbits.

Assessment of statistical difference of control with normal dose of Alfagin			
Parameters	Control	Normal Dose of Alfagin (0.25ml/Kg)	P-value
Hemoglobin (mg/dL)	8.56±0.19	10.09±0.22	<0.005
RBC (x10^6/c.mm)	4.22±0.22	4.74±0.20	0.67
WBC (x10^3/c.mm)	5.08±0.37	5.87±0.28	<0.05
Platelets (x10^5/c.mm)	1.02±0.07	1.05±0.07	0.78
Assessment of statistical difference of control with High dose of Alfagin			
Parameters	Control	High Dose of Alfagin (0.5ml/Kg)	P-value
Hemoglobin (mg/dL)	8.56±0.19	10.23±0.258	<0.005
RBC (x10^6/c.mm)	4.22±0.22	4.90±0.13*	<0.05

WBC ($x10^3$/c.mm)	5.08±0.37	6.34±0.49	<0.005
Platelets ($x10^5$/c.mm)	1.02±0.07	1.27±0.11	<0.05

At 95% Confidence level.

At P<0.05 or P<0.005, all the results were considered to be significant

- P<0.05 significant as compared to control
- P<0.005 highly significant as compared to control.

4. DISCUSSIONS

The most common type of Anemia is known as the Iron Deficiency Anemia (IDA). In this condition the body suffers from the abrupt decline of Red Blood Corpuscles (RBCs) due to the insufficient or inappropriate supply of oxygen to the tissues of the body (9). This insufficiency occurs due to iron deficiency in most of the cases so that the body is unable to produce RBCs which carry inadequate oxygen to the body resulting in Anemia (10).

Alfagin, the herbal composite of eluthrococcus senticoccus, Medicago sativa, Embilica officinalis, and Trigonella foenum graecum have reportedly antifungal, antimicrobial, and antihypercholesteremic abilities. The present study investigates its role in treating and recovering Iron deficiency anemia (IDA) by increasing the amount of Hemoglobin and RBCs to supply oxygen which can subsequently use to decrease the global burden of Anemia, annually.

Table 1 suggested the inter-group comparison of hematological parameters including the amount of hemoglobin, Red Blood Corpuscles (RBCs), White Blood Corpuscles (WBCs), and platelets when administered with the two dosage plans of Alfagin. The group 2 participants received the normal dose of Alfagin (0.25ml/Kg) twice a day for a period of 60 days. Whereas, the participants

of group 3 had been administered with the high dose of Alfagin (i.e., 0.5ml/Kg) twice a day for the same time frame. It has been observed that the high dose of Alfagin increases the proportion of hemoglobin significantly such that the Standard Error Mean (S.E.M) were observed as 10.23±0.258 as compared to control's hemoglobin content which was 8.56±0.19. Similarly, the increase in RBCs value from 4.22±0.22 in control group to 4.90±0.13*in high dose participants has also simultaneously indicating the healing effect of the constituents of Alfagin or Alfagin as whole.

Meanwhile, the table 2 suggested the statistical significance of normal and high dose of Alfagin in comparison with controlled values, when the Chi-square test was applied to indicate the difference within the different groups. The highly significant upsurge in Hemoglobin of normal dose administered rabbits shows its therapeutic response where $P<0.005$. While, the increase in the levels of WBCs indicated the prior infections of the experimental subjects i.e., Iron deficient Anemia (IDA). This condition has been altered ($P<0.005$, at 95% confidence level) by administering the high optimized dose of Alfagin (0.5ml/day/twice a day) to treat the iron deficient disorder.

All in all, Alfagin has been proved to be a good natural substitute of iron supplements for recovering the deficiency or insufficiency with same or similar effects and that too with natural extracts rather synthetic and toxic chemical alternatives.

5. CONCLUSION

The herbal formulation Alfagin (which consisted of eluthrococcus senticoccus, Medicago sativa, Embilica officinalis, and Trigonella foenum graecum) can help in treating Iron deficiency anemia (IDA) other than its anti-oxidant, anti-hypercholesteremic abilities. It has been done by increasing the amount of Hemoglobin and RBCs to supply maximum oxygen which can subsequently use to decrease the global burden of Anemia, annually.

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