A comparative study of impact of leaf concentrate and Iron and Folic acid supplementation on Blood profile of Anemic Adolescent girls

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SUMMARY AND CONCLUSIONS

The blossoming of adolescence in each generation is a fascinating sight, predictable and repetitive, yet none the less enchanting. The hallmark of adolescent years is change. There exist a general feeling in the society that adolescent years are normally free from major health problems. On the contrary it is a crucial period, because adolescent girl is still a developing child.

In spite of impressive gains in the field of health and nutrition, significant proportion of young people in developing countries suffers from nutritional anemia. The effect of earlier nutritional insult is visible in the adolescent age particularly in girls. Adolescence is a time of major physical, cognitive and psychological growth and development. The World Health Organization (2000) estimated that about 30-55% of adolescent girls suffer from anemia. In the seventh five year plan (2001), it has been highlighted that the problem of anemia is so acute that a consumption of the food based supplement action and fortification strategies would be necessary for us to make appreciable dent in the problem.

India was among the very first developing countries to have taken up the National Anemia Prophylaxis Programme NAPP in 1970 to prevent anemia among women and children through distribution of Iron and folate tablets. On consumption of these tablets subjects have reported, several side effects of gastrointestinal tract e.g. nausea, vomitting, etc. However due

to various reasons like irregular supply chain, poor compliance, the programme has not made an appreciable dent in prevention of anemia. Hence it prompts us to took at other alternatives. Use of leaf concentrate which is a good source of micronutrient is one such alternative.

Leaf concentrate, the concentrate extract of green plants is the most promising and novel source of micronutrients apart from being a good source of vegetable protein. The overall objective of the present study was to compare the effect of leaf concentrate and iron and folic acid tablet supplementation on blood profile of adolescent girls. The objectives to support the study were:

1. To find out the incidence of nutritional anemia among adolescent girls.
2. To determine dose the effect of giving therapeutic of leaf concentrate and IFA tablets (in the treatment of anemia) on the blood haemoglobin level of the subjects.
3. To assess the impact of supplementation on complete iron status of the subjects.

The present study was conducted in Shastri Nagar Kacchi Basti an urban slum area in Jaipur city. Adolescent girls residing in this slum area formed the target group. All the adolescent girls in the age groups of 14 to 18 years were contacted with the help of anganwadi workers and the objectives of the study were explained. The girls willing for the intervention trial were then listed on the basis of following criteria

- The Hb level of the subjects should be below 12 mg/dl
- Age should be 14-18 years
- The subject should be unmarried.
- The subject should not be suffering from any ailment.
- The subject should be willing to participate
- The family of subject should give its consent.

Total number of 120 subjects were taken and divided into two groups on the basis of supplementation

1) Experimental group II (IFA Supplementation)
2) Experimental group II (LC Supplementation)

One big tablet of iron and folic acid (60mg Iron and 500 ug folic acid) was given to group I every day and 10 gm of LC powder (8 mg iron and 0.03 mg folic acid) was used as herbal medicine for the second experimental group. It is worth mentioning here that Iron Folic acid tablets contain ferrous Sulphate in a purely chemical form whereas Leaf Concentrate is a natural food supplement and also contains micro amounts of various other minerals, vitamins and trace elements like zinc, copper etc.

A thoroughly planned motivational drive was carried out in the study area to acquaint the inhabitants of the possible beneficial effects of both the supplements. Supplementation was given for 135 days. Motivation was done by following strategy:

- Group discussions
- Door to door contact

- Practical demonstration (by consuming leaf concentrate powder)
- Motivation by anganwadi workers.
- By giving examples of other subjects who were consuming the supplements regularly.

About 120 anemic adolescent girls were selected and initial blood profile was performed. There were few dropouts who did not take the supplementation on regular basis and some others who had heavy menstruation, thyroid imbalance and other complications. These subjects were excluded from the final analysis. Finally the results of 90 subjects (40 subjects in IFA group and 50 subjects in LC group) were tabulated and compared.

Salient findings of the study:

- The results of the present study highlighted that a statically significant improvement had taken place in Hb levels as well as other blood parameters (i.e TRBC, PCV, MCV, MCH, MCHC, Serum Iron, Serum ferritin) of the subjects in both the groups.

- There was about 15% increment in hb level of subjects in both the groups. This data was even tested for larger sample size and it indicated that if LC was used as a supplement for larger population size then the result will prove to be more promising as compared to IFA.

- The iron content of an IFA tablets is 60 mg although 10 gm of LC powder supplied only 8 mg of elemental iron which is not at all comparable. In spite of this fact the results of both the groups were

comparable. There was no statistically significant difference between the two groups. This can be attributed to perhaps better absorption of LC.

- Microscopic examination of the slides at initial as well as final stage was also studied. Initially the slides showed Anisocytosis, Poikilocytosis, severe hypochromic microcytic, ovalocyte, macrocyte cells. These showed a shift towards Normocytic, normochromic and few microcytic mild hypochromic in both the groups after supplementation.

Conclusions and Recommendations

- The result of the study are promising for leaf concentrate which gave similar and comparable results on the iron status of the subjects. Both the supplements showed similar improvements.
- In spite of the small doze of leaf concentrate given to the subjects the other factors like presence of other micronutrients e.g. copper and zinc must have helped in bringing significant change in Hb levels as well as other blood parameters of the subjects. Several other studies have also highlighted that supplementation of zinc alongwith iron improves heamoglobin level and is beneficial in iron deficiency anemia (Kolesteren et al, 1999). Copper also plays a specific role in heamoglobin building as it stimulates heamoglobin regeneration (Hart et al, 1925; Mc Hargue et al, 1928). Keil and Nelson (1931) found that regeneration of heamoglobin occurred when pure $Fecl_3$ plus milk was given as supplement to rats, but the speed of

regeneration was greatly increased by addition of small amount of copper sulphate.

- The LC powder has grassy flavour and subjects initially have problems in consuming 10 gm of powder at a time. But because of close monitoring and rapport with the subjects, during the present trial, they were advised to consume this 10 g LC by taking a spoonful 2-3 times in a day. It is not that 10 g dose of LC is very problematic to consume; it can be taken orally with glass of water/ lemon juice/ buttermilk or mixed with chapati dough or yoghurt or lentils but perhaps a lower doze of 5 g LC powder can be introduced for long term basis into the existing supplementary feeding programmes and Mid day Meal programmes so that the vilnerable groups of people can get some additional amounts of micronutrient in their diets besides their usual intakes. The Government of Rajasthan is looking out, for a micronutrient supplement for its ICDS supplementary feeding programmes and leaf concentrate can be used for this purpose.