

Comparative Study on Effects of Beetroot Juice and Dates in Iron Deficiency Anemia Patients

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ABSTRACT

Anaemia is a haematological disorder affecting most commonly the females. Though there are various haematinics available in market to increase the Red Blood Cell Count, it has some side effects also. The aim of this study is to evaluate the effects of natural substances like dates and beetroot juice on anaemia patients and to compare which has prominent and rapid effect in increasing all haematocrit values within a short duration of time. A total of 10 anemia patients were selected. They were divided into two groups. Sample A were given beetroot juice of 250ml. 125ml in the midday and 125 in the evening(two times a day). Sample B were given 28 (250g) dates per day. 14 in the midday and 14 in the evening (two times a day) for other sets of patients. MCV, MCH, MCHC and Hb% are recorded before and after consumption by sending blood samples to the medical lab of Saveetha dental college. There was a significant raise in Hb level and slight improvement or changes seen in MCV, MCH and MCHC in the patients who consumed Beetroot juice than the patients who consumed dates. Hence, we can conclude that both the beetroot juice and dates show invariably great effect in treating anaemia. But compared to dates, beetroot juice produces significant rise in Haemoglobin, MCV, MCH and MCHC.

KEY WORDS: BEETROOT JUICE, ANEMIA, HAEMOGLOBIN, RED BLOOD CELL, DATES.

INTRODUCTION

Anemia is a diminishing in the aggregate sum of red platelets or Hemoglobin in the blood or a brought capacity of the blood down to convey oxygen. (Peerschke, 2002). When anemia comes on slowly the symptoms

are feeling tired, weakness, shortness of breath, and a poor ability to exercise (Janz and Hamilton, 2010). The diagnosis of anemia in men is based on a Hemoglobin less than 13 g/dl 14 g/dL; in women it is between 12 to 13 g/dL (Nissenson et al., 2005). Certain groups of individuals such as pregnant women benefit from the use of iron pills for treating anaemia (Bhutta et al., 2013). On assessment, the signs shown may incorporate whiteness yet this is certainly not a dependable sign. A bluish discoloration of the sclera may be noticed in some cases of iron deficiency anemia (Goodier, 2009). The most widely recognized reason for weakness is blood misfortune yet this typically doesn't cause any enduring side effects except if a generally hindered RBC creation creates, thus most normally by iron inadequacy. (Institute and National Cancer Institute, 2020). It is hard

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to quantify the RBC mass legitimately so the hematocrit or the Hemoglobin in the blood are regularly utilized rather to by implication gauge the worth (Uthman, 2009). Different elements liable for iron deficiency during pregnancy are gestational age, equality, continuous birth stretch, history of overabundance seeping during feminine cycle, intestinal parasitic contamination, jungle fever, interminable sickness and blood misfortune during pregnancy (Alemayehu et al., 2016).

The commonest reason for weakness is iron inadequacy, henceforth, it is regularly known as iron wholesome pallor (Fe). Sickliness influences around 33% of the total populace, a large portion of the cases are brought about by iron lack, this is a significant general medical issue worldwide. Iron is a component required for the development of hemoglobin. At the point when feeble red platelets separate, iron is discharged, put away and reused. Iron is put away as Hemosiderin and ferritin. A lady needs around 15 mg of iron to supplant the iron misfortune during feminine cycle. In instances of inordinate draining or ordinary seeping in feminine cycle, iron misfortune ought to be supplanted. In light of menstrual midpoints 60 ml of blood for each month, which is equivalent to 30 mg of iron, ladies need an additional milligram for every day to be ingested to look after parity. This shows how much ladies are getting influenced by pallor.

Beetroot is the taproot part of a beet plant (Eiger, 2009) typically referred to in North America as beet otherwise called table beet, garden beet, sugar beet, red beet, super beet or brilliant beet. It is one of a few developed assortments of *Beta vulgaris* developed for their edible taproots and leaves. At the point when beet juice is utilized, it is generally steady in nourishments with a low water content,, for example, solidified oddities and natural product fillings (Francis, 1999). Late investigations give proof that Beetroot ingestion offers gainful physiology impacts that give clinical results to hypertension, atherosclerosis, type 2 diabetes and dementia (Ninfali and Angelino, 2013). Beetroot is a rich source of photochemical compound that includes ascorbic acid, carotenoids, phenolic acids and flavonoids. Beetroot is likewise one of only a handful not many vegetables that contain a gathering of exceptionally bioactive colors known as betalains.

(Lee et al., 2005). Nirman walker claimed that Beetroots build red corpuscles with betalain and add tone to blood by increasing Hemoglobin levels (Priya et al., 2013). The Beetroot being a basic food with pH from 7.5 to 8 has been acclaimed for its medical advantages, specifically for its infection battling cancer prevention agent potential, huge measure of nutrient C and nutrients B1, B2, niacin, B6, B12 while the leaves are an astounding wellspring of nutrient A (Zielinnska-Przyjemska et al., 2009). Betanin acquired from the roots is utilized mechanically as red food shading to improve the shading and kind of tomato glue, sauces, sweets, sticks and jams, frozen yogurt, candy and breakfast grains among different applications (Lock, Grubben and Denton, 2004).

Dates are fruits that contain iron which is enough to match the needs of iron, vitamin C, vitamin B complex and folic acid that can help the formation of red blood cells, so that by consuming the dates can help improve the formation of red blood cells and prevent anemia (Rahmani et al., 2014). Protein, carbohydrates and fats in dates support the synthesis of Hemoglobin (Sotolu, Kigbu and Oshinow, 2014). The combination of dates rich in glucose, Calcium, Iron, Zinc, Copper, Phosphorous, Niacin and content of vitamin A is able to improve Hemoglobin levels in anemic patients ('Assessment of yield and nutritional composition of fruit of wild date palm (*Phoenix sylvestris* Roxb.) cultivars', 2017). Dates are wealthy in selenium, manganese, copper and magnesium and these are required with regards to keeping our bones sound and forestalling osteoporosis. The potassium in dates assists with decreasing cholesterol and diminishes the danger of a stroke. Several studies were conducted showing intake of beetroot juice and dates increases the Haemoglobin level of anaemia patients. The aim of the study is to evaluate among Beetroot juice and Dates which has the better effects on iron deficiency anaemia patients.

MATERIALS AND METHODS

10 anemia patients were selected and divided into two groups Sample A and Sample B. Sample A group were given 28 dates (250g). 14 dates in the midday and 14 dates in the evening. Sample B groups were given Beetroot juice of 250ml. 125 ml in the mid day and 125 ml in the evening (two times a day). Both the groups were advised to continue the same for 21 days. The selected subjects were not suffering from any other chronic illness. Consent letter was signed by the participants and documented. MCV, MCH, MCHC and Hb% of the subjects were recorded before and after consumption by sending blood samples to the medical lab of Saveetha Dental College.

Inclusion criteria: Patients with iron deficiency anaemia due to irregular menstruation.

Female patients with age groups between 15-30 years.

Exclusion criteria: Patients with diabetes, malignancy and other interminable illnesses. Patients under haematinics treatment. Patients under ayurvedic and homeopathic treatment.

RESULTS AND DISCUSSION

As iron deficiency anaemia is most prevalent among females, the participant chosen for this experimental study were females. The subjects of the study were between the age group of 15- 30 years of female. The process of iron deficiency takes several stages to become anaemia. If the iron deposits do not meet with iron intake, there will be significant reduction in haemoglobin concentration.

Group A, consumed Dates for 21 days.

Table 1.1: Hb value in Anaemia Patients.

	Mean	Standard deviation	SEM
Before	8.300	2.380	1.064
After	8.500	2.380	1.064
Student paired T test p value	<0.0001		

Table 1.2: MCV values in anemia patients.

	Mean	Standard Deviation	SEM
Before	86.000	9.328	4.172
After	86.760	8.812	3.941
Student paired T test p value	<0.05		

Table 1.3: MCH Values in Anemia patients

	Mean	Standard Deviation	SEM
Before	32.160	7.905	3.535
After	33.220	7.826	3.500
Student paired T test p value	<0.0001		

Table 1.4: MCHC values in anaemia patients.

	Mean	Standard Deviation	SEM
Before	32.240	2.180	0.975
After	33.440	2.503	1.119
Student paired T test p value	<0.0001		

Their average value of Haemoglobin level (Table1.1), MCV (Table1.2), MCH(Table 1.3) and MCHC(Table1.4) were compared with before and after experiment by Student's t paired test value. From the tabulation it is clear that there is significant raise in all values of blood parameters after consumption of dates. The combination of dates rich in glucose, Ca, Fe, Zn, Cu, P and niacin content of vitamin A is able to improve hemoglobin levels in anemic patients.

Group B, had Beetroot juice for 21 days. Their average value of Haemoglobin level (Table2.1), MCV (Table 2.2),

MCH(Table 2.3) and MCHC(Table 2.4) were compared with before and after experiment by Student's t paired test value. From the tabulation it is clear that there is a significant raise in all values after consumption of Beetroot juice.

Table 2.1: Hb values in anaemia patients

	Mean	Standard Deviation	SEM
Before	8.000	1.559	0.697
After	8.440	1.483	0.663
Student paired T test p value	<0.0001		

Table 2.2: MCV value in Anaemia patients

	Mean	Standard Deviation	SEM
Before	24.440	5.899	2.638
After	26.660	6.189	2.768
Student paired T test p value	<0.0001		

Table 2.3: MCH value in Anaemia patients.

	Mean	Standard Deviation	SEM
Before	74.880	15.006	6.711
After	77.240	14.156	6.331
Student paired T test p value	<0.05		

Table 2.3: MCH value in Anaemia patients.

	Mean	Standard Deviation	SEM
Before	31.540	2.110	0.944
After	33.080	2.406	1.076
Student paired T test p value	<0.05		

This result supports previous studies reporting that beetroot is an excellent source of iron (Biondo et al., 2014). Beetroot (*Beta vulgaris* L.) is a main source of iron, nitrate, sodium, potassium, and betalain among vegetables. Easton Patrick (2011) states that consuming

beetroot juice or cooked beet in salads is highly beneficial in treating anemia. The cost of beet root is also low as compared to other iron-rich vegetables and it is easy to store .

Figure 3.1: Comparison of Haemoglobin level between Dates and Beetroot juice



Figure 3.2: Comparison of MCV between Dates and Beetroot juice

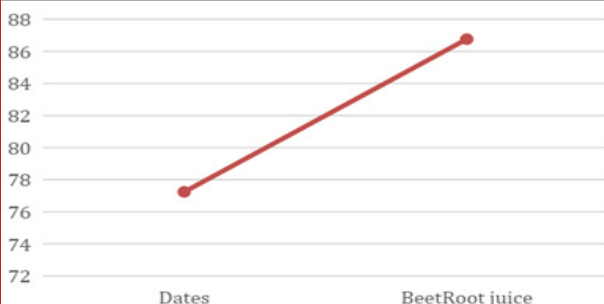


Figure 3.3: Comparison of MCH between Dates and Beetroot juice.

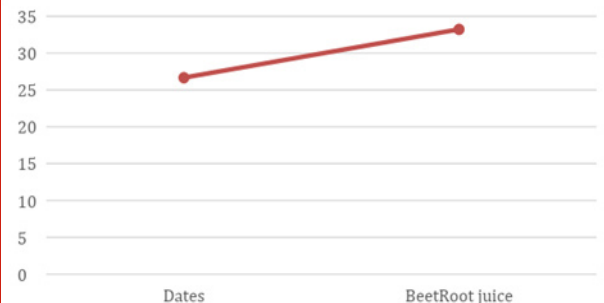


Figure 3.4: Comparison of MCHC between Dates and Beetroot juice



When compared between Group A and Group B, there was a significant raise in Hb level (Figure3.1) and slight improvement or changes were seen on MCV (Figure3.2), MCH (Figure3.3) and MCHC (Figure3.4) in patients who consumed Beetroot juice than the patients who consumed dates. It shows that both beetroot juice and dates can increase Hb level but beetroot juice increases the Hb level faster and more efficiently when compared to dates. If iron deposits have not been met with iron intake (Fe) there will be anemia symptoms accompanied by decreased hemoglobin. This study was a pilot study comprising only 10 subjects. Also, the duration of the study was just 3 weeks. It does not deal with other types of anaemia. As beetroot juice and date fruits are also good sources of vitamins, further research has to be done to analyse whether there is possibility in treating other forms of anaemia like pernicious and megaloblastic anaemia.

CONCLUSION

Based on the obtained data beetroot appears to be a powerful dietary source for several pathological disorders. Beetroot is one of the best ways to increase Hemoglobin levels. It is not only high in iron content but also folic acid along with potassium and fiber. Consuming both beetroot juice and dates increase the Hemoglobin in anemic patients but when compared to dates, beetroot juice increases the Hemoglobin more efficiently and rapidly. Therefore it is better to drink beetroot juice daily to ensure healthy blood count.

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Conflict of Interest: None to declare

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