

THE EFFECT OF *GREWIA TINNAS* (GUDDAIM FRUIT) PRODUCT ON COMPLETE BLOOD COUNT AMONG ANEMIC PATIENTS AND HEALTHY VOLUNTEERAbdurrahman Habib*¹ and Dr. Leena B. Mirghani^{2,3}^{1,2}Alneelain University, Faculty of Medical Laboratory Sciences, Department of Hematology.³Alghad International College for Applied Medical Sciences, Riyadh, Saudi Arabia.***Corresponding Author: Abdurrahman Habib**

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ABSTRACT

Background: Guddaim fruits contain 6.3% protein, 0.4% fat, 8.1% crude fiber, 4.5% ash, 15.1% starch, 1.6% sucrose, 21.0% D-glucose, and 24.3% D-fructose. The proximate composition as well as the content of amino acids, mineral elements (K, Ca, Mn, Fe, Cu and Zn). Mineral elements are considered to be essential substances for the well functional of an organism. They have fundamental roles in regulating the different biological processes of an organism such as: activating the Intracellular and extracellular enzyme, regulating the liquid compartment PH which permits the achievement of metabolic reaction and controlling the osmotic equilibrate between cells and their environment. **Objective:** The aim of this study was to study the effect of Grewia Tinnase (Algudim) products on CBC in healthy and among anemic patient. **Methods:** This descriptive experimental study included 40 participants as study group and 40 were control group. Student in the study group were subjected to oral consumption of GT juice for two months. Complete blood count (CBC) was measured pre and post using for the anemic and healthy individual an automated analyzer (Sysmex NK21) for all samples. **Results:** This study included 40 patients anemic and 40 normal as control the experimental study were performed pre and post after two months of product consumption (G. juice) the result of CBC among study group were compared before and oral consumption of GT, and significant differences were detected for CBC. There was a significant increase in (Hb, RBCs, PCV%, MCV, MCH, MCHC, and RDW) in anemic group pre and post consumption of GT juice. While in control group there was a significant increase in (Hb, PCV%, RDW), but no significant was shown in (MCH and MCHC). When the result of CBC compared between case and control groups, there was a significant correlation pre and post intake the GT juice. There was no significant correlation between the age and case group and control group. **Conclusion:** In conclusion significant increase in CBC parameters were detected after consumption of GT juice.

KEYWORDS: Grewia Tinnas, CBC, Anemic Patients.**INTRODUCTION**

Bark smooth grey, very fibrous so that twigs are hard to break. Leaves alternate, almost circular in outline, 1.5-4cm In diameter, margins toothed and prominently trinnerved at the star shaped hairs. Stipules inconspicuous, falling early. Flowers solitary or in pairs, axillarily placed, petals white, about 1cm long; sepals long and recurved. Fruit Orange -red at maturity, with,^[1-4] spheroid lobes. Grewia tembensis and G. tenax are virtually indistinguishable in fruit .the specific epithet refers to the plants tenacious growth habit, the genus was named after Nehemiah Grew, one of the founders of plant physiology.

This plant is used traditionally in Sudan for the treatment and prevention of iron deficiency anemia because it contains iron and calcium.

Many plants have been identified, but the lack of data on their chemical composition has limited the prospects for their utilization,^[5] it obvious that Guddaim plant is used in traditional medication and treatment in Sudan; It is used to treat flesh irritation and skin inflammation for both human beings and animals. Guddaim fruits may be eaten ripe or kept for later usage because it consists of great proportion of carbohydrates in liquidized form; and a great amount of Iron and calcium. Some efforts were made to promote Guddaim fruits and its Industrial utilization.^[6] From Guddaim fruit, people prepare drink for pregnant women. Guddaim fruits, both fresh and dry, are favored and extensively consumed by Sudanese population.^[7] In Sudan, a drink is prepared by soaking the fruits over-night and then they are hand pressed, sieved and sweetened Alight porridge Is prepared by the addition of flour or custard to grewia drink and served during the fasting month of Ramadan and is also fed to

lactating mother to improve their health and lactating abilities. Moreover, the fruits are made into a fermented drink In Sudan and southern Africa.^[8] *G. tenax* fruit was reported to contain large amounts of iron,^[9] and as such is used for treatment of anemia and malaria.^[10] However, limited research has been carried out on exploitation and utilization of *grewia* species fruits as a potential food source. Furthermore, their good taste is acceptable to human palate. The main target of this work was to study the nutritional potential of these three species.

Complete blood counts are done to monitor overall health, to screen for some diseases, to confirm a diagnosis of some medical conditions, to monitor a medical condition, and to monitor changes in the body caused by medical treatments.^[3]

MATERIALS AND METHODS

This study was case control study, eighty students were enrolled in this study into two groups, study group including 40 students, those were under daily dose of 23gm of guddaim dissolved in 250ml of water for two months, and another 40 students were control group.

The samples area was Khartoum state; blood samples were collected from each participant, and then subjected to CBC by automated blood analyzer.

Data were collected using structured questionnaire; the data analysis was done by SPSS program.

Ethical consideration

Ethical approval was obtained from Ethical committee of research in the Faculty of Medical Laboratory Science, Alneelain University; verbal consent was taken from each study participant.

RESULTS

The current study included 80 participants, they were classified into two groups; case group includes 40 of anemic participants, and the other group was 40 healthy participants.

Regarding the case group, 34 (85%) of them were female, while 06 (15%) were male, their age was ranged between 17 to 42 years, and it was classified into following groups; 17-23, 24-29, 30-35, and 36-42, and their distribution was as following, 34 (85%), 01 (2.5%), 03 (7.5%), and 02 (5%) respectively.

Figure (1) show the reading test of (Hb, RBCs, PVC%, MCV-fl, MCH-pg, and MCHC g/dl) before and after consumption Guddaim juice to population, so they show increase of the reading after take this juice.

Figure (2) show standard deviation before and after take *G.* juice, for this test (Hb, MCV-fl, MCH-pg, and MCHC/dl) that show decrease and the (RBCs and PCV) tests increase after consumption.

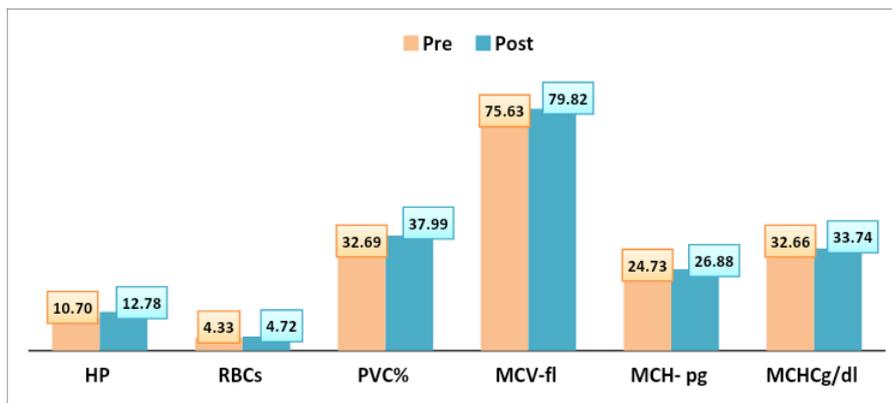


Figure (1): Reading of (TWBCs, HP, RBCs, PVC%, MCV-fl, MCH-pg, and MCHC g/dl) before and after product consumption (*G.* juice).

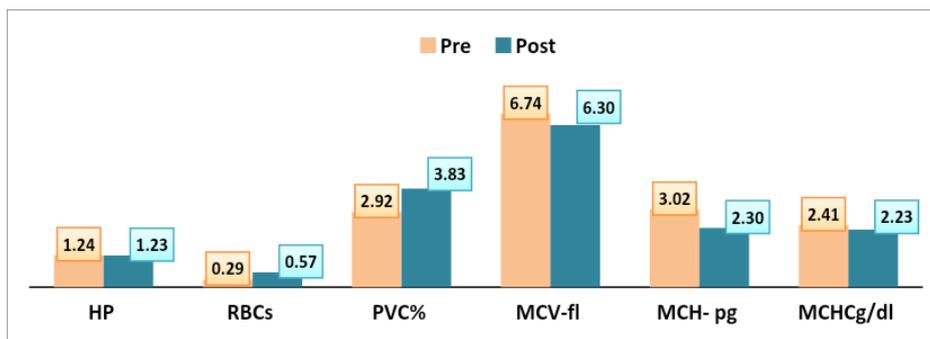


Figure (2): Standard deviation for this test (Hb, RBCs, PVC%, MCV-fl, MCH-pg, and MCHC/dl) before and after taking *G.* juice.

Statistical tests

Table (1) show result for all tests (Hb, RBCs, PCV%, MCH fl, MCHC g/dl, RDW-cv) before and after consumption of G. juice.

There is difference in value of (Hb) level before and after took the juice, also show difference at (RBCs) before and after (P value 0.05). The average of RBCs count increase after drinking juice.

Regarding (PCV %) level before and after juice, there is statistical significance, the average increase after took the G.juice.

The study results showed statistical significance in difference average at test (MCV-fl) after and before taking the G. juice lead to increase after drinking juice.

Also it was statistically significant in the difference of (MCH-pg) level before and after took the juice.

When it comes to the (MCHC g/dl) value difference before and after taking juice, it was statistically significant with P value < (0.05).

Regarding (RDW-cv %) before and after taking juice; there is a statistical difference in the result increase after consumption juice.

Correlation coefficient

Table (2) show the values of the correlation between age and difference at the level of this test (HP, RBCs, PCV% , MCV, MCH, MCHC and RDW) respectively there is slight positive relation between age and difference of this test (Hb, RBCs, PCV,MCV, MCH and MCHC) also found slight negative relation between the age and value of this test (RDW-cv).

Table 1: Test for Hb, RBCs, PVC%, MCV-fl, MCH-pg and MCHC/dl before and after G. juice in case.

Test	Mean		Std. Deviation		t	Sig. (2-tailed)	
	Pre	Post	Pre	Post			
Pair 1	HP Pre - HP Post	10.700	12.785	1.2445	1.2259	-8.494	.000***
Pair 2	RBCs Pre - RBCs Post	4.3348	4.7170	.29403	.57194	-4.094	.000***
Pair 3	PVC% Pre - PVC% Post	32.693	37.990	2.9176	3.8288	-7.367	.000***
Pair 4	MCV-fl Pre - MCV-fl Post	75.635	79.820	6.7422	6.2954	-3.173	.003***
Pair 5	MCH- pg Pre - MCH-pg Post	24.733	26.878	3.0196	2.2993	-4.517	.000***
Pair 6	MCHCg/dl Pre - MCHC-pg Post	32.665	33.735	2.4131	2.2320	-2.415	.021**
Pair 7	RDW-cv % Pre - RDW-CV Post	15.648	13.805	2.4829	1.5081	4.912	.000***

Brand(*)Means that the result was significant at only one significant level (0.1)

Brand(**)Means that the result was significant at two significant levels(0.1and 0.05)

Brand(***)Means that the result was significant at only three significant levels (0.1,0.05,0.01)

Table 2: Correlation between age and difference on tests before and after taking G. juice in case group.

RDWdif	MCHCdif	MCHdif	MCVdif	PCVdif	RBCsdif	Hbdif	Pearson Correlation	Age
-.080	.183	.172	.039	.174	.121	.275		
.624	.259	.290	.813	.283	.456	.086	N	
40	40	40	40	40	40	40		

Control group

Regarding the gender of control group, out of 40 participants; (50%) were female and (50%) were male. According to age they distributed as follow (17-18), (19-20), (21-22) and (23-25) years (figure 3).

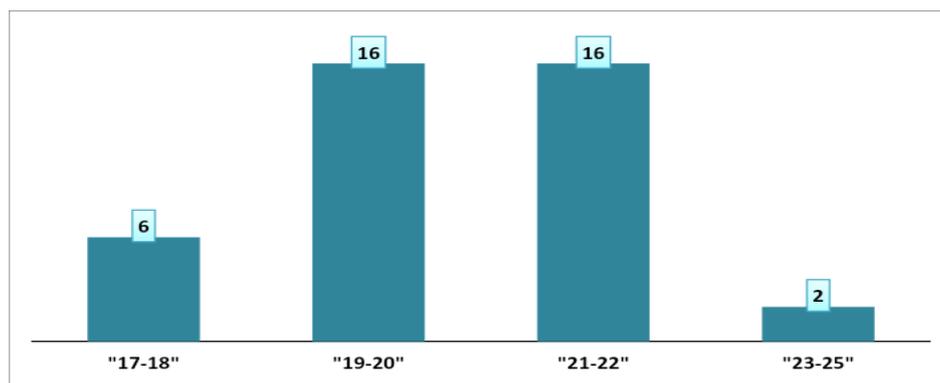


Figure (3): Distribution of study population according to age.

Figure (4) show the reading test of (Hb, RBCs, PCV%, MCV-fl, MCH-pg, and MCHC/dl) before and after consumption G.juice to population, so they show increase of the reading after took the juice.

Figure (5) show standard deviation before and after took juice for this test (Hb, RBCs, PVC%, MCV-fl, MCH-pg, and MCHCg/dl) that show decrease at standard deviation of the all tests after taking G. juice except (Hb and PCV%) increase.

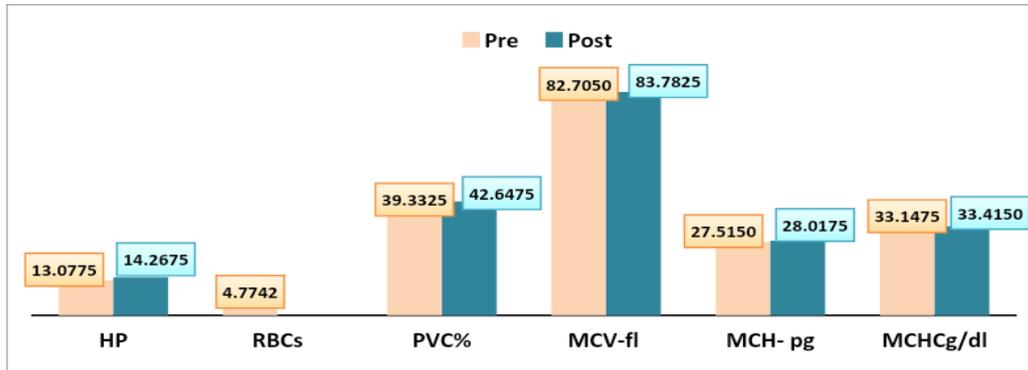


Figure (4): Reading of (HP, RBCs, PVC%, MCV-fl, MCH-pg, and MCHC g/dl) before and after product consumption (G. juice).

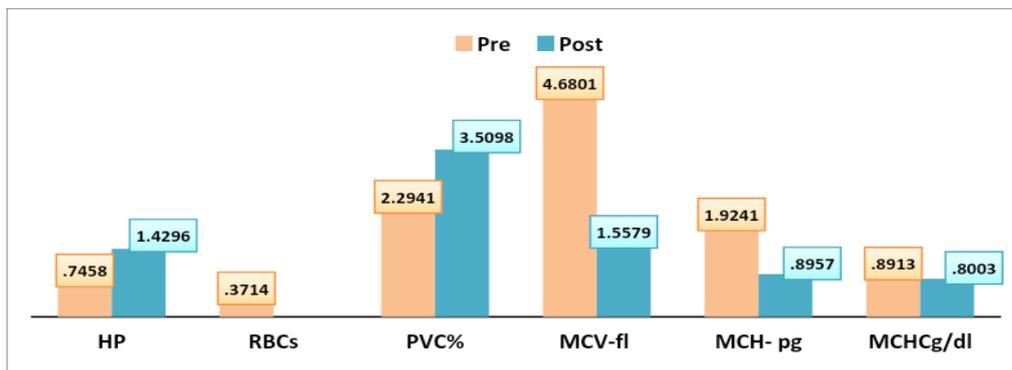


Figure (5): Standard deviation for this test (, Hb, RBCs, PVC%, MCV-fl, MCH-pg, and MCHC/dl) before and after taking G. juice.

Table (3) illustrates the following:

There is a difference in value of (Hb) before and after took the juice. And the average of this test is lager after taking G.juice.

There was a statistical difference in the measure mean of (PCV %) before and after taking juice and the value of test lager after taking G.juice.

No significant difference value between the average measurement of the (MCV-fl) test before and after consumption of the juice.

No significant statistical difference value between measurement test of (MCH) before and after consumption of the juice.

The measurement of the average test (MCHC g/dl) not differs before and after taking G. juice.

Significant difference value between the average measurement of the (RDW-cv) test before and after consumption of the G.juice and that average measurement lager before taking G. juice.

Table 3: Test for (Hb, RBCs, PCV%, MCV-fl, MCH-pg and MCHC/dl) before and after taking G. juice in control group.

Test	Mean		Std. Deviation		T	Sig. (2-tailed)	
	Pre	Post	Pre	Post			
Pair 1	HP Pre - HP Post	13.078	14.268	.7458	1.4296	-8.391	.000***
Pair 2	PVC% Pre - PVC% Post	39.333	42.648	2.2941	3.6183	-7.972	.000***
Pair 3	MCV-fl Pre - MCV-fl Post	82.705	83.783	4.6801	3.5098	-1.077	.288
Pair 4	MCH- pg Pre - MCH-pg Post	27.515	28.018	1.9241	1.5579	-1.246	.220
Pair 5	MCHCg/dl Pre - MCHC-pg Post	33.148	33.415	.8913	.8957	-1.223	.229
Pair 6	RDW-cv % Pre - RDW-CV Post	14.010	13.383	.9015	.8003	3.304	.002***

Brand(*)Means that the result was significant at only one significant level (0.1)

Brand(**)Means that the result was significant at two significant levels(0.1and 0.05)

Brand(***)Means that the result was significant at only three significant levels (0.1,0.05,0.01)

Correlation coefficient

Table (4) show the correlation between age and differences at the level of this test (Hb, RBCs, MCV, MCH, MCHC) respectively. There is slightly positive relation between age and difference of this test (Hb, PCV, RBCs, MCV, MCH) and slightly negative relation between age and value of this test (MCHC, RDW).

Table (5) shows the result of tests for separate samples case and control. Study this table we conclude the following:

There is significant statistical difference on (Hb) result before and after between case and control group where the value Sig < 0.05 in another meaning the average difference before and after for this test in the case group not equal with differences before and after taking G.juice for control group whereas the average differences in case group is largest.

Depend on the value Sig= 0.019 special test (PCV) we conclude existence significant statistic difference between the average different in the two groups case and

control so as to favor of the case group bigger than average differences before and after consumption of the juice in control group.

Test the value of Sig =0.064 test for (MCV) we conclude there is moral difference between the average differences in the control and case group. The average differences before and after taking juice in the case group greater than average spreads before and after taking the juice in control group.

Notice in the result of (MCH) test existence significant statistic differences in the average different on the two group case and control whereas the average of case group lager than that in control group.

No moral difference in (MCHC) test between the average differences in the control and case group.

Notice value of Sig in (RDW) test we conclude existence significant statistic difference between the average different in the two groups case and control.

Table 4: Correlation between age and difference on tests before and After juice in control group.

RDW dif	MCHC dif	MCH dif	MCV dif	PCV dif	Hb dif	Age		
-.162	-.070	.195	.243	.096	.069	1	Pearson Correlation	
.318	.667	.229	.131	.555	.670		Sig. (2-tailed)	Age
40	40	40	40	40	40	40	N	

Table 5: Comparison the result differences between two groups case and control.

Test	Levene's Test for Equality of Variances		t-test for Equality of Means			Mean Case Dif	Mean Control Dif
	F	Sig.	t	df	Sig. (2-tailed)		
HPdif	Equal variances assumed	4.384	.040** *	-3.157	78	.002***	-2.0850
	Equal variances not assumed			-3.157	62.427	.002***	
PVCdif	Equal variances assumed	3.067	.084**	-2.387	78	.019**	-5.2975
	Equal variances not assumed			-2.387	62.457	.020**	
MCVdif	Equal variances assumed	2.573	.113	-1.877	78	.064*	-4.1850
	Equal variances not assumed			-1.877	72.712	.065*	
MCHdif	Equal variances assumed	.222	.639	-2.636	78	.010*	-2.1450
	Equal variances assumed			-2.636	75.999	.010*	
MCHC dif	Equal variances assumed	4.895	.030**	-1.624	78	.108	-1.0700
	Equal variances assumed			-1.624	56.942	.110	
RDWdif	Equal variances assumed	18.548	.000** *	2.890	78	.005***	1.8425

	Equal variances assumed			2.890	57.758	.005***	
	Equal variances not assumed			.653	61.306	.516	

Brand(*)Means that the result was significant at only one significant level (0.1)

Brand(**)Means that the result was significant at two significant levels(0.1and 0.05)

Brand(***)Means that the result was significant at only three significant levels (0.1,0.05,0.01)

DISCUSSION

guddaim is the Dark smoth grey ,very fibrous so that twigs are hard to break ,found in chad,iran, Ethiopia, sudan Saudi Arabia and Somalia.it is contain of protein, fat, starch and mineral element [CA,K,zn,cu,mn and fe]. in sudan the guddaim used in traditional medication to treatment aneamia, malaria, fed to lactating mother to improve their health and it used also to treat flesh irritation and skin inflammation the fruits are made into a fermented drink in sudan and southern Africa.^[8] From guddiam prepare drink for pregnant woman, in sudan a drink is prepard by soaking the fruits over- night and then they are hand pressed.

In this study there was The result showed a statistically increased and significant increased in study and control group (*p .value*:0.000).This finding was agree with that study conducted in Hussein village near Giad town and hospital.

CONCLUSION

A significant increase was detected in the CBC test after oral consumption of guddaim in both study and control group. CBC test showed a statistically significant increased, there was significant difference when case group compared to control group in CBC. There was no significant correlation between age and CBC in case group and also control group.

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