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Potential Effect Of Some Functional Beverage On Blood Antioxidant Profile Of Children

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Abstract

The present study was designed to investigate the effect of juice (a mixture of plum, grape juice and rosella extract with different recipe) with high natural antioxidant on the blood antioxidant profile as an indicator for children immunity. One hundred and twenty children(mean weight was 50±10 kg) divided into two groups normal and diabetic each groups divided into sub groups male and female(10 child each). Every child take 100 ml of juice for four weeks as follows: control groups were drunk no juice . antioxidant group was taken antioxidant tablets as unnatural antioxidant and other groups were drunk mixture of juice with Mix1,Mix2,Mix3 and Mix4.At the end the results showed that blood antioxidant in normal children showed that an increase in the activity of the antioxidant enzymes. Group six that were drinking mix3 of juice showed 25.4% ,29% and 23.8%higher of Glutathione Reduced when compared with zero time parameter , control group and antioxidant group. The highest mean values of Glutathione-s- Transferase in female were drunk on mix3 of juice when compared with zero time parameter and antioxidant group . The effect of drinking different levels of juice mixtures on completely blood picture in diabetic.

male children showed that Hb levels for all groups were higher than control group. The highest one was group four with 15.7 ,7.7 and5.9% increase when compared with zero time parameter, control group and

antioxidant groups respectively .WBCs results for diabetic female children, it could be showed that all groups were higher than control groups. The highest group were group six with 67.3, 52.7 and 25.7% increase when compared with zero time parameter, control group and antioxidant groups respectively . In conclusion, The results showed that the best treatment group 6 which drink mix 3 of juice for both normal and diabetic groups .

Introduction

Diets contain naturally occurring antioxidant compounds that can stabilize highly reactive, potentially harmful molecules called free radicals. Free radicals are generated during normal cellular metabolism and result from the metabolism of certain drugs or xenobiotics the ability of antioxidants to destroy free radicals protects the structural integrity of cells and tissues. (**Adrianne,.1993).**

Many antioxidants can be obtained directly from the diet (e.g. ascorbic acid, a-tocopherol, carotenoids and polyphenolic flavonoids) or require micronutrients as integral components (e.g. Se in the metallo enzyme glutathione peroxidase. Numerous epidemiological studies have found strong associations between diets rich in antioxidant nutrients and a reduced incidence of cancer, and it has been suggested that a boost to the body's immune system by antioxidants might, at least in part, account for this.(**David 1999).**Oxidative stress is associated with several pathologies like cardiovascular, neurodegenerative, cancer and even aging. It has been suggested that a diet rich in antioxidants would be beneficial to human health and a lot of interest is focused on the determination of antioxidant capacity of natural products**.Camiloet al.,(2013).** Plum, possessed the highest antioxidant capacities and total phenolic contents among tested fruits, and could be important dietary sources of natural antioxidants for prevention of diseases caused by oxidative stress**. Fu Li *et al*., (2011).** Phenolic compounds, related to antioxidative and antifungal properties of ethanolic extracts from five commercial grape cultivars.(**Sagdic et al., 2001**).**Wang et al.,(2014)** indicated that Hibiscus sabdariffa leaves could be considered as a potential antioxidant source for the food industry. The aime of the present study was to evalute som patintial therapeutic effects of som mixtures fruit juice which rich in natural antioxidant as flavonoids and

phenolic compounds and theirz effect on blood antioxidant as an indicator of the situation of immunity.

Materials and Methods:

Materials

Fruits (plum and grapes) roselle in addition to honey and sugar obtained from Samanoud city market, Gharbia Governorate,Egypt. Chemicales of glutathione-s-transferase , glutathione reductase and glutathione reduced were obtained from Beta Alelmy Company, Dakahlia Governorate, Egypt . The tryptone nutrient agar obtained from Agriculture faculty as a gift.

Children

The current study involved one hundred and twenty children (mean weight was 50±10 kg) divided into groups normal and diabetic the normal group admitted to Alsida Zinab School , meet bader, Gharbia Governorate,Egypt, where is the diabetic one admitted to Mansoura university children hospital Each groups divided into sub groups male and female. Every child was taken 100ml of juice for four weeks.

Methods:

Technological method:

Juice preparation:-

Juices were extracted by electric juicing. Roselle was extracted by boiled water in the ratio of 1:3 (W/ V). The mixture setteled for one hour thenmanualy filtrated .The total soluble solids (T.S.S) of every juice were raised to 20% by adding sugar, pasteurized at 90^{o}C for one minute, cooled into 4^{o}C (Rizk et al., 1978), packed into glasses bottles and stored at 0^{o}C for preparing blends. Mixtures were prepared from every sorts of juices and Roselle extract by blending them together for 2 minutes as the designed ratios. For covering all these mixtures 4 groups of mixtures were prepared as described as follow :-

Group	plum	grapes	Roselle extract	Honey	sugar
Mix1	25%	25%	50%	7%	7%
Mix2	50%	--------	50%	7%	7%
Mix3	50%	50%	30%	7%	7%
Mix4	------	50%	50%	7%	7%

All such table blends were sensory evaluated with respect to their taste and color according to the method which will be mentioned in the traditional blends sensory estimation.

Chemical composition

Determination of ascorbic acid:

Ascorbic acid content was determined using 2-6-dichlorophenol indophenol according to the method as described by **A.O.A.C (1995).**

Determination of total phenolic compounds and total flavonoids :-

Total phenolic content was determined by the folin-ciocalteus micro-method according to the method as described by **Ordon et al., (2000).**

Total flavonoid content was determined by the method of **Adel et al., (2013).**

Experimental design:

Twenty children (mean weight 50±10 kg) divided into groups normal and diabetic the normal group admitted to alsida zinab School, Gharbia, Egypt. where is the diabetic one admitted to Mansoura university children hospital Each groups divided into subgroups male and female. Every child was taken 100ml of juice daily for four weeks as follows:-

Group1 :- zero time parameter.

Group2:- (control G) drinking no juice.

Group3:- :-(antioxidant group) take a dietary supplement (Antox tablets)

Group4:- drinking juice consists of mix 1.

Group5:- drinking juice consists of mix 2.

Group6:- drinking juice consists of mix3.

Group 7:- drinking juice consists of mix 4.

Biochemical analysis:-

At the end of the experiment, blood samples were collected in clean dry centrifuge tubes from hepatic portal vein. Blood samples for hemoglobin were taken by heparinized micropipette and heparinized micro hematocrit tube for determination of packed cell volume (PCV). Blood was centrifuged for 10 minutes at 3000 rpm to separate the serum, which were kept in tubes at –18ºC till analysis. Biochemical analysis was carried out in Mansoura University Children hospital Laboratory , Mansoura , Egept.

Blood samples were used for determination of the concentration following parameters:

Activity of hepatic detoxification enzymes (glutathione reduced , Glutathione s transferas and redactas) According to the method described by (**Beutler et al., 1963), (Habig et al., 1974) (Goldberg and spooner,1983)**.

cbc tests (Hb, Rbcs, Platlets, wbc and Lemph) Hemoglobin was determined according to the method described **(Dacie, etal,1991).**

White blood cell count(WCCS): were estimated according to the method described by **(Lee, et al,2001).** Platelets estimated according to the method described by **(Dacie , et al,1991).** Red Blood cells count were estimated according to the method described by **(Dacie, et al,1991).**

Results and Discussion:

Table (1) Effect of drinking different juice mixtures on blood antioxidant in normal male Children

Parameter	Zero time parameter	Control group	Antioxidant group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Glutathione Reduced (GSH)	58.93^{c}	59.23^{c}	61.73b^{c}	64.6^{bc}	63.16^{bc}	76.4 ^{a}	71.83^{ab}	8.9
Glutathione s- transferase	2881^{c}	2907^{c}	2890.6^{c}	4288^{b}	4929^{ab}	5306.3^{a}	3978^{b}	980
Glutathione reductase	49.9^{c}	53.03^{bc}	67.2^{a}	67.2^{a}	66.06^{a}	62.66^{ab}	66.3^{a}	9.7

* values in the same row not sharing acommon superscript letter differ significantly at p≤0.05, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

Table (2) Effect of treatment with different mixtures for 30 days on blood antioxidant in normal female children.

Parameter	Zero time parameter	Control group	Antioxi-dant group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Glutathione Reduced	59.9^{c}	65.6^{bc}	71.7^{ab}	65.3^{bc}	76.3^{a}	74.9^{a}	69.6^{ab}	7.2
Glutathione-s- Transferase	2680.3^{c}	3390.3^{c}	5171^{a}	3890^{c}	4844^{ab}	5504.6^{a}	4384.6^{bc}	905.9
Glutathione Reductase	68.5a^{b}	66.9^{b}	71. 8^{ab}	70.69^{b}	78.3^{a}	70.8^{ab}	64.3^{b}	7.58

* values in the same row not sharing acommon superscript letter differ significantly at p≤0.05, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

The effects of drinking different juice mixtures on blood antioxidant in normal mal children are shown in Table **(1)**. By drinking the prepared

mixtures for 30 days group six that were drinking mix3 of juice showed 25.4% ,29% and 23.8%higher of Glutathion reduced when compared with control group , Zero time parameter and antioxidant group. while the lowest mean value of group five which were drinking mix2 when compared with Zero time parameter (63.16 Mg/dL). Mix3 of juice showed significant increase of Glut reduced compared with control , Zero time parameter and antioxidant group. There were no significant difference between group4and 5 compared with control group, Zero time parameter and antioxidant group. Results of Glutathion-s- transferase showed that All groups were higher than control group. But the highest one which drinking mix3 of juice with percentage 84.1%,82.5% and 83.5% when compared with control group, Zero time parameter and antioxidant group. All groups were significant increase when compared with control group, Zero time parameter and antioxidant group.

Results of Glut reductase showed that all groups were higher than control group when compared with control group. the highest value mix3 of juice with Percentage 29.7% ,29% when compared with control group and Zero time parameter and with Percentage 23.8% when compared with antioxidant . Mix1,mix2and mix4 of juice showed a significant increase for Glut Reductas compared to control group, Zero time parameter and antioxidant group. Similar results obtained by **Essa et al.,(2007)** who noticed that Oral administration ofAlcoholic extract of *Hibiscus sabdariffa* leaves HSEt the administered extract significantly increased the levels of antioxidants such as catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx) and reduced glutathione (GSH) in brain tissues of hyperammonemic rats. This investigation demonstrates significant anti-hyperammonemic and antioxidant activity of HS.

Table **(2)** indicates The effects of drinking different juice mixtures on blood antioxidant in normal female children. We can observe that the lowest value in female Glutathion reduced were drunk mix1 when compared with control group with percentage of 9% . While the highest value in female were drunk mix2when compared with Zero time , control group parameter and antioxidant group with percentage of 27.3,16.3 and 6.4% respectively . Mix2 and mix3 of juice were significantly increased compared to Zero time parameter and control

group. Drinking with mix4 showed non-significant increase compared to Zero time parameter and antioxidant group.

However, The results of Glut-s- transferase were showed that the highest values of Glut-s- transferase in female were drunk on mix3 of juice when compared with control group . and antioxidant group . While the lowest value in female were drunk on mix1 corresponding to Zero time parameter and antioxidant group. All group were significantly increase when compared with Zero time parameter and control group .

As shown in table**(2)** of Glut reductase the lowest value in female was drunk on mix4 when compared with Zero time parameter and antioxidant group. While the highest value in femal were drunk on mix2when compared with Zero time parameter and antioxidant group with percentage of 14.3% and 9% . Group five showed a significant increase compared with control group and Zero time parameter. Group 4 and 6 showed non-significant increase compared to control group, Zero time parameter and antioxidant . From **table (1)** and **(2)** we can noticed that mix2and mix3 seemed to be the best mixtures of juice .

Table (3) Effect of drinking different levels of juice mixtures on Cbc in normal mal children.

Parameter	Control group	Control group	Antioxi-dant group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Hb	10.6^{c}	11.3^{bc}	11.8^{ab}	12.5^{a}	12.4^{ab}	12.6^{a}	11.8^{ab}	1.1
Rbcs× 1000000	3.5^{c}	3.7^{bc}	3.8^{ab}	3.9^{ab}	4.1^{ab}	4.2^{a}	3.9^{ab}	0.36
Platlets× 1000	169.6^{cb}	205^{cb}	239^{b}	336.3^{a}	295^{ab}	325^{ab}	227.6^{cb}	89.4
wbc×1000	4996.6^{cb}	5040.6^{cb}	6283.3^{b}	7216.6^{ab}	7500^{ab}	7983.3^{ab}	8230^{a}	1722.9
Lemph	27^{a}	28^{a}	29^{a}	28.3^{a}	27.3^{a}	28.3^{a}	27^{a}	2.5

* values in the same row not sharing acommon superscript letter differ significantly at $p \leq 0.05$, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

Table (4) Effect of drinking different juice mixtures on Cbc in normal female children.

Parameter	Control group	Control group	Antiox-idant group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Hb	9.2^{c}	10.7^{b}	11.2^{ab}	12.1^{a}	11.8^{ab}	12.4^{a}	11.3^{ab}	1.2
Rbcs× 1000000	3.0^{c}	3.5^{bc}	3.7^{ab}	3.9^{ab}	3.9^{ab}	4.1^{a}	3.9^{ab}	0.42
Platlets× 1000	169.6^{c}	223.3^{bc}	286^{ab}	260.6^{ab}	298.3^{ab}	326.3^{a}	224.3^{b}	91.2
wbc×1000	4596.6^{f}	5072^{cf}	5909.3^{bc}	7366.6^{a}	7500^{a}	6863.3^{ab}	7893.3^{a}	1299.6
Lemph	26^{a}	28.0^{a}	28.6^{a}	27.3^{a}	28.3^{a}	28.6^{a}	29.6^{a}	3.7

* values in the same row not sharing acommon superscript letter differ significantly at $p \leq 0.05$, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

Table (3) showed the effect of drinking different juice mixtures on cbc in normal male.From table (3) it could be noticed that results of Hb showed a significant increase to mix1 and mix3 compared to zero time parameter and control group where is mix2 and mix4 showed a significant($P \leq 0.05$) increase comparing with zero time parameter.

In the same table results of Rbcs showed that there were a significant increase from all groups compared with zero time parameter.mix3 showed a significant increase comparing to zero time parameter and control group.

Also the results of Platlets from the same table showed a significant increase from mix1 compared to control group 1,2 and antioxidant group .

Wbc results showed a significant increase from group7 compared to zero time parameter, control group and antioxidant group

Results of Lemph from the same table showed no significant difference from all group compared to zero time parameter, control group and antioxidant group.

Results agree with **Ahmed etal.,(2013) who** investigated the effect of the aqueous extract of *H. sabdariffa* seeds on anemic rats. Results showed that the increase was significant in the hemoglobin, PCV and

RBC count of hemorrhagic anemic rats and the extract caused significant increase in the hemoglobin level of the nutritionally iron-deficient rats. **Gudurueta**l.,**(2013)**showed that methanolic leaf extract of *Hibiscus tiliaceus*(MLHT)showed a significant increase in the production of circulating antibody titer in response to sheep red blood cells (SRBCs). A significant (P<0.001) increase in both primary and secondary HA titer was observed when compared to control group. It also enhanced the production of RBC, WBC and hemoglobin.

Table (4) showed the Effect of drinking different levels of juice on Cbc in normal female children

From table (4) it could be noticed that results of Hb showed a significant increase to mix1 and mix3 compared to zero time parameter and control group where is mix2 and mix4 showed a significant increase comparing with zero time parameter.

In the same table results of Rbcs showed that there were a significant increase from all groups compared with zero time parameter.Mix3 showed a significant increase comparing to zero time parameter and control group.

Also the results of Platlets from the same table showed a significant increase from all groups compared to zero time parameter. But mix3 showed a significant increase comparing with zero time parameter and control group .

Wbc results showed a significant increase from all groups compared to zero time parameter, control group and antioxidant group

Results of Lemph from the same table showed no significant difference from all group compared to zero time parameter, control group and antioxidant group

Results dis agree with **Lakshmi etal.,(2013)** found that *Vitisvinifera (Black grapes)* showed a statistically significant decrease in hemoglobin, red blood cell and total leukocyte count was observed.

Table(5) The effect of drinking different levels of juice mixtures on blood antioxidant in diabetic mal Children.

Parameter	Zero time param-eter	Control diabetic group	Antiox-idant diabetic group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Glutathione Reduced	53.8^{bc}	49.6^{cb}	58.36^{b}	67.8^{ab}	63.8^{ab}	72.1^{a}	65.2^{ab}	10.23
Glutathione-s- transferase	2881^{bc}	1732.3^{c}	3264^{ab}	4280^{ab}	3123^{bc}	4823.3^{a}	4065.6^{ab}	1624.5
Glutathione Reduced	53.35^{cd}	46.67^{d}	58.92^{b}	63.4^{ab}	68.86^{a}	67.5^{ab}	62.33^{ab}	8.7

* values in the same row not sharing acommon superscript letter differ significantly at $p \leq 0.05$, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

Table (6) The effect of drinking different juice mixtures on blood antioxidant in diabetic female Children.

Parameter	Control diabetic group	Control diabetic group	Antioxi-dant diabetic group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Glutathione Reduced	65.4^{d}	64.23^{d}	68.36^{cd}	78.53^{bc}	97.1^{a}	83^{b}	75.6^{bc}	11.9
Glutathione-s- transferase	3196^{c}	4107.3^{bc}	3837^{bc}	5270.6^{b}	6855^{a}	4984.6^{b}	5022.3^{b}	1443.7
Glutathione Redactase	68.32^{c}	65.14^{c}	81.4^{b}	99.4^{a}	99.4^{a}	82.8^{b}	76.19^{bc}	11.7

* values in the same row not sharing acommon superscript letter differ significantly at $p \leq 0.05$, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

Effect of drinking different levels of juice mixtures on blood antioxidant in diabetic mal Children showed in table(5).

It could be observed that Glutathione Reduced level of mix3 of juice was increased significantly compared to zero time parameter, control group and antioxidant group and so mix3 seem to be the best treatment .

Drinking with mix1,2 and 4 showed non-significant increase compared to zero time parameter, control group and antioxidant group.

No significant difference in Glutathione s transferase among all groups under investigation .Mix3 was significantly increased compared to zero time parameter and control group it seem to be the best group.

By speaking about blood antioxidant it could be noticed from the same table that Glut reda level of all groups showed a significant increase compared to zero time parameter and control but group six showed a significant increase compared with zero time parameter and control group antioxidant group and seem to be the best one. Results dis agree with**Adeyemi et al.,(2014) who** stated that flavonoid-rich aqueous fraction of methanolic extract of *Hibiscus sabdariffa* calyx was evaluated for its anti-hepatotoxic activities in streptozotocin-induced diabetic Wistar rats Reduced levels of glutathione (GSH), catalase (CAT), superoxide dismutase (SOD), and glutathione peroxidase (GPx) (3.76+or-0.38 micro M, 0.42+or-0.04 U/L, 41.08+or-3.04 U/ml, 0.82+or-0.04 U/L respectively) in the liver of diabetic rats were restored to a near normal level in the *Hibiscus sabdariffa*-treated rats (6.87+or-0.51 micro M, 0.72+or-0.06 U/L, 87.92+or-5.26 U/ml, 1.37+or-0.06 U/L respectively.

Suaib et al (2009)., showed that Varieties of medicinal plants*(Hibiscus subdariffa Linn)* are recognized as a source of natural antioxidants that can protect from oxidative stress, thus playing an important role in chemoprevention of diseases. **Abdel-Moemin et al.,(2014)** showed that the high positive correlation between antioxidant capacities and total phenolic. And **Eshghi et al., (2014)** noticed that *Grapes* are significant sources of nutritional antioxidants as well as biologically active dietary components. Antioxidant activity had a positive significant correlation with amount of phenols and anthocyanin. **Hemayet et al.,(2015)** showed that Substantial amounts of phenols and flavonoids were noticed from the ethanolic leaf extract of *Hibiscus tiliaceus* and thus, justify the free radical scavenging and antioxidant .**Liang et al., (2014)** Grapes are rich in phytochemicals with many proven health benefits. The total antioxidant activities were significantly correlated with the total phenolics and flavonoids. However, no significant correlations were found between antiproliferative activities and total phenolics or total flavonoids content

Table(6)showed the effect of drinking different juice mixtures on blood antioxidant in diabetic female Children. it is evidence that juice pronounced rise of *Glutathione reduced*. Groups five and six which drink mix2 and mix3 of juice showed significant improve of Glutathione reduced compared with zero time parameter, control group and antioxidant group. There were a significant difference between group 4and 7 compared with control group and zero time parameter .

In the same table results of *Glutathione s transferase* showed that the best glut trans significant increase was recorded for group five which drink mix2 of juice. All groups showed a significant increase compared to zero time parameter.

As regard to Glutathione Reductase drinking mix1 and mix2 of juice showed a increased significantly Glut Reductas as compared to zero time parameter, control group and antioxidant group. Mix3 of juice showed a significant increase compared with zero time parameter and control .The best groups seem to be group four and five.Results disagree with **Lakshmi et al.,(2013)** who showed that black grapes had a significant decrease in superoxide dismutase and catalase activities, and the concentration of GSH in the liver and kidneys of rats. while our results agree with **Boas et al.,(2014)** resulted that among the cultivars evaluated, the consumption of grape juice from cultivar 'BRS Violeta' is suggested due to its higher content of vitamin C, antioxidant activity, total phenolics, anthocyanins, and also due to a better physicochemical characteristic showed, when compared to the juices of the other cultivars. And **Da-Costa et al(2014).,** showed that Extracts(Hibiscus sabdariffa) showed antibacterial, anti-oxidant, nephro- and hepato-protective, renal/diuretic effect, effects on lipid metabolism (anti-cholesterol), anti-diabetic and anti-hypertensive effects among others. This might be linked to strong antioxidant activities, inhibition of alpha-glucosidase and alpha-amylase, inhibition of angiotensin-converting enzymes (ACE), and direct vaso-relaxant effect or calcium channel modulation. Phenolic acids (esp. protocatechuic acid), organic acid (hydroxycitric acid and hibiscus acid) and anthocyanins (delphinidin-3-sambubioside and cyanidin-3-sambubioside) are likely to contribute to the reported effects. **Lima et al.,(2014)** showed that the Brazilian grape juices have high antioxidant activity, which was significantly correlated with the phenolic compounds catechin, epicatechingallate, procyanidin

B1, rutin, gallic acid, caffeic acid, p-coumaric acid, pelargonidin-3-glucoside, cyanidin-3-glucoside, cyaniding-3,5-diglucoside and delphinidin-3-glucoside.

Table(7)Effect of drinking different levels of juice mixtures on Cbc in diabetic mal children.

Parameter	zero time param-eter	Control diabetic group	Antiox-idant group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Hb	10.8^{b}	11.6^{ab}	11.8^{ab}	12.5^{a}	12.4^{a}	12^{ab}	11.8^{ab}	1.5
Rbcs× 1000000	3.5^{b}	3.8^{ab}	3.9^{ab}	4.2^{a}	4.1^{a}	3.9^{ab}	3.9^{ab}	0.49
Platlets× 1000	206.3^{b}	270^{ab}	315.3^{a}	207.3^{b}	209^{b}	253.6^{ab}	227.6^{ab}	99.5
wbc×1000	4996.6^{c}	5040.6^{c}	6283.3^{bc}	7216.6^{ab}	7166.6^{ab}	7983.3^{a}	8230^{a}	1695.1
Lemph	28.6^{a}	29^{a}	27.6^{a}	27.3^{a}	28.6^{a}	28.6^{a}	30.6^{a}	3.5

* values in the same row not sharing acommon superscript letter differ significantly at p≤0.05, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

Table (8) the effect of drinking different juice mixtures on Cbc in diabetic female children.

Parameter	zero time param-eter	Control diabetic group	Antiox-idant group	Mix 1	Mix 2	Mix 3	Mix 4	LSD
Hb	10.5^{c}	11.7^{ab}	12.2^{a}	11.2^{bc}	11.7^{ab}	11.9^{ab}	12.0^{ab}	0.9
Rbcs× 1000000	3.5^{c}	3.9^{ab}	4^{a}	3.7^{bc}	3.8^{ab}	3.9^{ab}	4^{a}	0.29
Platlets× 1000	192.3^{a}	256.6^{a}	249^{a}	220^{a}	256^{a}	224^{a}	224.6^{a}	87.2
wbc×1000	5050^{c}	5533.3^{bc}	6719.6^{ab}	8373.3^{a}	7366.6^{ab}	8450^{a}	6446.6^{ab}	2012.2
Lemph	28.6^{a}	28.6^{a}	28.6^{a}	28^{a}	28^{a}	27.3^{a}	27.3^{a}	3.3

* values in the same row not sharing acommon superscript letter differ significantly at p≤0.05, Mix1(plum25%- grapes25%- Roselle extract50%- Honey7%- sugar7%) Mix2(plum50%- Roselle extract50%- Honey7%- sugar7%)- Mix3(plum50%- grapes50%- Roselle extract30%- Honey7%- sugar7%) Mix4(grapes50%- Roselle extract50%- Honey7%- sugar7%).

Table (7) showed the Effect of drinking different levels of juice on Cbc in diabetic mal children.

From table (7) it could be noticed that results of Hb showed a significant increase to mix1 and mix2 compared to zero time parameter. In the same table results of Rbcs showed that there were a significant increase from group4 and 5 compared with zero time parameter.

Also the results of Platlets from the same table showed a significant increase from groups4 and 5 compared to antioxidant group.

Wbc results showed a significant increase from all groups compared to control group and 2 zero time parameter.

Results of Lemph from the same table showed no significant difference from all group compared to control group 1,2 zero time parameter and antioxidant group. Results agree with**Yahaya et al.,(2012) who stated** the test groups were given extracts of Roselle, Moringa, that the hematology and blood serum analysis of the test rats showed significant ($p<0.05$) healthy conditions of the packed cell volume, hemoglobin, red blood cells, white blood cells and serum protein compared to the control rats. And agree with Mishra **et al.,(2012)** who reported that treatment of mice with crude extract of Hibiscus rosasinensis flowers (500 mg/kg BW) and Bougainvillea spectabilis leaves (800 mg/kg BW) for a period of 30 days indicates a significant increase in the level of hemoglobin and count of RBC but a significant decline in the level of MCH and MCV in the former case. On the other hand, in B. spectabilis treated animals, the level of hemoglobin, RBC count & PCV declined significantly.

From table (8) it could be noticed a significant ($P < 0.05$) increase in Hb for the groups drank mix2,3 and mix4 compared to zero time parameter. Where mix 1showed a significant difference comparing with antioxidant group .

from the same table results of Rbcs showed that there were a significant increase from group5,6 and 7 compared with zero time parameter.

Also the results of Platlets from the same table showed no significant increase from all groups compared to control group, an zero time parameter d antioxidant group.

Wbc results showed a significant increase from all groups compared to zero time parameter.

Results of Lemph from the same table showed no significant difference from all group compared to zero time parameter, control group and antioxidant group. Results agree with**Gao e tal., (2003)** showed that trans-Resveratrol is a dietary polyphenolic compound present in grapes, which has been shown to exhibit strong anti-inflammatory, antioxidant, and chemopreventive activitiesIntragastric administration of resveratrol (2 mg daily) to mice for 4 weeks showed no effect on age-related gain in body weight, peripheral blood cell counts (WBC, RBC, or platelets).

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التأثير المحتمل لبعض المشروبات الوظيفيه علي صوره مضادات الاكسدة بالدم عند الاطفال.

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الملخص العربى:

هذه الدراسة تم إعدادها لمعرفه تأثير بعض العصائر المحتوية علي مضادات أكسدة طبيعيه علي مضادات الأكسدة بالدم كمؤشر لمناعة الأطفال. تم تقسيم ١٢٠طفل(متوسط وزنهم ٥٠± ١٠ كجم) تم تقسيمهم لمجموعتين مجموعة طبيعيه وأخري مريضه بالسكر وكل مجموعه سواء طبيعيه أو مريضه تم تقسيمها لمجموعتين الأولى إناث والثانية ذكور(١٠ للمجموعة). كل طفل تناول ١٠٠مل من العصير لمده ٤ أسابيع كالتالي:- ألمجموعه التي لم تناول العصير في بداية التجربة والمجموعة الضابطة :- لم تتناول العصير حتى نهاية التجربة و مجموعه مضادات الاكسده :- المجموعة التي تتناول مضادات أكسده غير طبيعيه علي شكل اقراص و المجموعات الاخري هي التى تتناول الخلطات المختلفة من العصير خلطات ١و٢و٣و٤.في نهاية التجربة يتم جمع عينات الدم لتحليلها وتقدير مضادات الاكسده بالدم ونشاط الانزيمات (جلوتاثيونردكتاز-جلوتاثيونرديوسد-جلوتاثيون اس ترانسفيراز) – صوره دم كاملة .وأوضحت نتائج مضادات الاكسده بالدم بالنسبة للذكور الطبيعيين ظهور زيادة في نشاط الإنزيمات المضادة للاكسدهوالمجموعه السادسة والتى تناولت خلطه ٣ من العصير اظهرت ارتفاع في الجلوتاثيون رديوست بنسبه ٢٥.١٤ و٢٩ و٢٣.٨ % مقارنه ب المجموعه الضابطه والمجموعه التى لم تتناول العصير منذ بدايه التجربه وبجموعه مضادات الاكسده. وكانت اعلي قيمه للجلوتاثيون اس ترانسفيرازللاناث التى تناولت خلط ٣ من العصير مقارنه بالمجموعهالكنترول ١وبمجموعه مضادات الاكسده.وكانتاثير تناول مستويات مختلفه من خلطات العصير علي صوره الدم الكامله لذكور الاطفال المصابين بالسكر ارتفاع في مستوى الهيموجلوبين لجميع المجاميع مقارنه بالمجموعه الكنترول .وكانت اعلي مجموعه هي المجموعه الرابعه بنسبه زياده ١٥.٧% ، ٧.٧% ، ٥.٩% مقارنه بالمجموعه الكنترول وبالمجموعه التي لم تتناول العصير من بدايه التجربه وبمجموعه مضادات للاكسده. وكانت نتائج خلايا الدم البيضاء لاناث المريضه بالسكر تظهر ارتفاع بين جميع المجموعات مقارنه بالمجموعه الكنترول وكانت اعلاهم المجموعه السادسه بنسبه زياده ٦٧.٣و٥٢.٧ و ٢٥.٧%مقارنه بالمجموع الكنترول ١و٢ وبمجموعه مضادات الاكسده واشارت النتائج ان افضل مجموعه هي المجموعه السادسه والتى تتناول خلطه ٣ من العصيرلكلا من المجموعه الطبيعيه والمجموعه المريضه بالسكر.

الكلمات الفتاحيه: عصير طبيعي ،جلوتاثيون ريدكتاز، الهيموجلوبين، مريض السكر، خلايا الدم البيضاء.