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EFFECTS OF COFFEE AND OVALTINE (MILO) ON BLOOD PRESSURE IN HEALTHY INDIVIDUALS

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ABSTRACT

Background: The pressor or depressor effect of ovaltine (Milo) and coffee is significant for both public and scientific perspectives. They are most commonly consumed beverages around the world with limited and controversial data available. **Methods:** The study was carried out with null hypothesis that single high dose of coffee and normal amount of ovaltine would affect systolic and diastolic blood pressure. The study was open labelled nonrandomized prospective with parallel groups. There were 84 subjects enrolled (38 Ovaltine and 46 coffee) and equal number of controls for Ovaltine and coffee respectively. The negative control were in across over fashion. The confidence interval was 95% and confidence level was 99%. **Results:** The increase in mean systolic blood pressure of ovaltine groups and ovaltine control were 5.21mmHg (4.42%) p value<0.001 and 0.58mmHg (0.50%) p value>0.05 where as The change in mean diastolic blood pressure of ovaltine groups and ovaltine control

between 0 and 30 minutes were 4.24 mmHg (5.47%) p value< 0.001 and 1.11mm Hg(1.43%) p value< 0.01. **Conclusion:** Ovaltine (Milo) intake leads to modest increases in systolic and diastolic blood pressure while coffee has shown only a minute change in blood pressure. Our results provide support for a correlation between ovaltine (Milo) and coffee intake and increase in blood pressure. In persons with hypertension and other heart diseases safe usage needs further evaluation.

KEYWORDS: Ovaltine (Milo), Coffee, Systolic Blood Pressure, Diastolic Blood Pressure, Hypertension**.**

OBJECTIVES

To determine the effect of Coffee and Ovaltine (Milo) on systolic and diastolic blood pressure in healthy volunteers.

INTRODUCTION

Coffee and Ovaltine are most commonly consumed beverages around the world.[1] In Latin America coffee plants are found in huge numbers and similar is for Southeast Asia, Maldives, and Africa.[2] There is limited and controversial data available regarding the effect of Coffee and Ovaltine on cardiovascular system.[3-5] According to Marijke van Dusseldorp the determent presser effect of coffee are based on amount, frequency and rate of caffeine metabolism. individual with high coffee craving are less sensitive to the pressure elevating effect of caffeine.[6]

Ovaltine (Ovomaltine) is a brand of milk flavoring product made with malt extract which contained acesulfame is a calorie free sugar which is produced by soaking a 2-1 mixture of aspartame and acesulfame potassium. It has been predicted that increase in triglycerides and hypertension have been correlated with a high intake of calorie free sweetened soft drinks.[7-9] A malt containing drink is fermented alcoholic or nonalcoholic prepared from barley. According to the Dr. Sheldon G. Sheps, hypertension specialist with the Mayo Clinic drinking malt extracts containing alcoholic type can cause hypertension.[10]

This study signify for both scientific and public perspective, to discuss its health benefits or harmful aspects.[11] The drinking of coffee and/or Ovaltine with Blood pressure has an association or at any specific amount is still to be establish despite many researched based

studies, So we have opted to find out any acute change in healthy individual's diastolic and systolic blood pressure and adverse effect due to consumption of Coffee and Ovaltine (milo).

MATERIAL AND METHOD

The study was carried out with null hypothesis that single high dose of coffee and normal amount of Ovaltine would affect systolic and diastolic blood pressure. The study was open labelled nonrandomized prospective with parallel groups. There were 84 subjects enrolled (38 Ovaltine and 46 coffee) and equal number of controls for Ovaltine and coffee respectively. The negative control were in across over fashion. The confidence interval was 95% and confidence level was 99%. The level of accuracy at the end point was revalidated by considering the approximate usage of coffee and Ovaltine at the region of this research. The calculation of sample size was done by creative research tool developed to facilitate public research.

The participants were accommodated into four groups (A, B, C and D) were Ovaltine control, Ovaltine and coffee control, coffee respectively comprising of 84 participants. The participants in this research were under graduate medical students of Mohi Uddin islamic medical college of graduation year 2019. The subjects were selected nonrandomly with consent. Participants with history of illness related to heart and using medication for blood pressure, depression, anxiety like symptoms, vascular diseases were excluded from the study. The study was conducted during November to December 2016. There were 28 males and 56 females. The participants were rested in a hall for a duration of two hours while the data was collected to remove any confounding effect on Systolic and Diastolic Blood Pressure due to any possible stress (mental and physical).

The coffee (with milk, sugar and water) and Ovaltine were given after measurements to make it standardized for all the participants by using a physical balance electrically operated with 0.001mg precision. The Systolic and Diastolic Blood Pressure were measured before taking drink i.e., at 0 and then after a fix interval of thirty minutes up to 120 minutes. The same participants were treated as negative control one week after being enrolled as active group participants under similar environment. The brand of Ovaltine (Milo) which we utilized contain Milk solid, fat soluble vitamins A, D and water soluble B1, salt, minerals stabilizers, Cocoa Powder, artificial flavour malt Extract (may contain Gluten), sugar, soya lecithin, and Acesulfame.

The Coffee (with milk, sugar and water) contain Powder Milk (Every Day) sixteen grams Coffee two and a half grams, Sugar twelve grams and Water one hundred and eighty millilitres.

Performa was provided to the participants to enlist the side effects they have felt during and after the study.

The Systolic Blood Pressure and Diastolic Blood Pressure was determined twice after every 30 minutes for a period of two hours. The research tool for analysis were carried out by using SPSS 16.0.

RSULTS

There were 84 participants, out of which 56 were female and 28 were male. The further subdivision in groups for female were 26 and 30 for Ovaltine and Coffee respectively while The further subdivision in groups for males were in 16 and 12 for Coffee and Ovaltine (Milo) respectively. It was disclosed by 3 participants {0 Coffee, 03 Ovaltine (Milo)} that they were heavy smokers while 03 participants (02 Ovaltine, 01 Coffee) were used to inhale tobacco through shisha. Out of 84 paticipants 19 {12 Coffee 7 Ovaltine (Milo)} were taking coffee/tea once a day, 3 subject {01 Coffee 02 Ovaltine(milo)} were taking coffee/tea two times/day, 06 participants {03 Coffee 03 Ovaltine(milo)} were taking coffee/tea three times a day and 4 subject {01 Coffee 03 Ovaltine(milo)} were taking tea/coffee occtionally.

The mean systolic component of blood pressure of subjects served with coffee were 114.26mmHg±1.478 and 114.28mmHg±2.18, at 0 and 30minutes respectively after taking coffee. The mean systolic component of blood pressure of coffee control group were 111.76.03mmHg ±1.837 and 112.70mmHg ±1.664 at 0 and 30 minutes respectively without taking any drink. The increase in mean systolic component of blood pressure of coffee groups and coffee control were 0.02mmHg (0.017%) p value> 0.05 and 0.94mm Hg (0.84%) p value <0.05 respectively.

The mean diastolic component of blood pressure of subjects served with coffee were 75.98 mmHg ±1.076 and 77.37mmHg±1.688, at 0 and 30 minutes respectively after taking coffee. The mean diastolic component of blood pressure of coffee control group were 76.76 mmHg±1.97 and 76.11mmHg±1.405 at 0 and 30minutes respectively. The change in mean

diastolic component of blood pressure of Coffee and Coffee control were 1.39mmHg(1.83%) p value <0.001 mmHg and 0.65 (0.86%) p value> 0.05 respectively.

The systolic component of blood pressure of subject served with Ovaltine were 117.82mm Hg±1.167 and 123mm Hg±1.726 at 0 and 30minutes respectively. The mean systolic component of blood pressure of Ovaltine control group were 114.84mm Hg±1.576, and 114.26mm Hg±1.490 at 0 and 30minutes respectively. The increase in mean systolic component of blood pressure of ovaltine groups and ovaltine control were 5.21mm Hg (4.42%) p value< 0.001 and 0.58mm Hg (0.50%) p value> 0.05 respectively.

The diastolic component of blood pressure of subject served with Ovaltine were 77.9mm Hg±1.29 and 81.63mm Hg±1.524 at 0 and 30minutes respectively after taking Ovaltine. The mean diastolic component of blood pressure of Ovaltine control group were 77.58 mm Hg±1.628,and 76.47 mm Hg ±1.362 respectively without taking any drink. The change in mean diastolic component of blood pressure of ovaltine groups and ovaltine control between 0 and 30minutes were 4.24mm Hg (5.47%) p value< 0.001 and 1.11mm Hg (1.43%) p value< 0.01 respectively.

The information related to unwanted effects due these two drinks i.e., coffee and Ovaltine were inquired by close ended questionnaire which includes headache (16 coffee 35%, 12 Ovaltine 32), dry mouth (13 coffee 28%, 06 Ovaltine 16%), dizziness (13 coffee 28% 07 Ovaltine 18%), nervousness (09 coffee 19%, 01 Ovaltine 2.6%), increased urination (05 coffee 11%, 01 Ovaltine 2.6%), nausea (05 coffee 11%, 06 Ovaltine 15.78%), heart burn (09 coffee 19%, 01 Ovaltine 2.6%), irritability (04 coffee 9%, 01 ovaltine 2.63 %) flushed skin (01 coffee 2%) palpitation (08 coffee 26%, 2 Ovaltine 5%), blurred vision (01 coffee 2%), trimmers (01 Coffee 2%) and Insomnia 14 (Coffee 31%, 03 Ovaltine 8%).

Table: 01. Mean of Systolic Blood Pressure At 0 and 30 minutes of Coffee Group Coffee Control Group

		Systolic B.P at 00 min (before drug administration) in Coffee group	Systolic B.P at 30 min (after drug administration) in Coffee group	Systolic B.P at 00 min (without drug administration) in Coffee group control	Systolic B.P at 30 min (without drug administration) in Coffee group control
N	Valid	46	46	46	46
	Missing	27	27	27	27
Mean		114.26	114.28	111.76	112.70
Std. Error of Mean		1.478	2.184	1.837	1.664
Median		115.00	116.50	110.00	110.00

Mode	110	120	110	110
Std. Deviation	10.025	14.812	12.456	11.284
Variance	100.508	219.407	155.164	127.328
Range	50	60	50	60
Minimum	80	80	90	90
Maximum	130	140	140	150
Sum	5256	5257	5141	5184

Table: 02. Mean of Diastolic Blood Pressure At 0 and 30 minutes of Coffee Group Coffee Control Group

		Diastolic B.P at 00 min (before drug administration) in Coffee group	Diastolic B.P at 30 min (after drug administration) in Coffee group	Diastolic B.P at 00 min (without drug administration) in Coffee group control	Diastolic B.P at 30 min (without drug administration) in Coffee group control
N	Valid	46	46	46	46
	Missing	27	27	27	27
Mean		75.98	77.37	76.76	76.11
Std. Error of Mean		1.076	1.688	1.297	1.405
Median		78.00	80.00	78.50	78.00
Mode		80	80	80	80
Std. Deviation		7.298	11.449	8.794	9.529
Variance		53.266	131.083	77.342	90.810
Range		40	50	40	50
Minimum		50	50	60	55
Maximum		90	100	100	105

Table: 03. Mean of Systolic Blood Pressure At 0 and 30 minutes of Milo (Ovaltine) Group Milo Control Group

		Systolic B.P at 00 min (before drug administration) Milo group	Systolic B.P at 30 min (after drug administration) Milo group	Systolic B.P at 00 min Milo group control	Systolic B.P at 30 min Milo group control
N	Valid	38	38	38	38
	Missing	35	35	35	35
Mean		117.82	123.03	114.84	114.26
Std. Error of Mean		1.167	1.726	1.576	1.490
Median		120.00	125.00	113.50	116.00
Mode		120	130	110	120
Std. Deviation		7.192	10.643	9.716	9.182
Variance		51.722	113.270	94.407	84.307
Range		30	45	50	40
Minimum		100	100	90	90
Maximum		130	145	140	130
Sum		4477	4675	4364	4342

Table: 04. Mean of Diastolic Blood Pressure At 0 and 30 minutes of Milo (Ovaltine) Group & Milo Control Group

		Diastolic B.P at 00 min (before drug administration) Milo group	Diastolic B.P at 30 min (after drug administration) Milo group	Diastolic B.P at 00 min Milo group control	Diastolic B.P at 30 min Milo group control
N	Valid	38	38	38	38
	Missing	35	35	35	35
Mean		77.39	81.63	77.58	76.47
Std. Error of Mean		1.290	1.524	1.628	1.362
Median		80.00	82.50	80.00	78.00
Mode		80	85	80	80
Std. Deviation		7.954	9.396	10.037	8.398
Variance		63.272	88.293	100.737	70.526
Range		41	45	50	48
Minimum		55	60	60	50
Maximum		96	105	110	98
Sum		2941	3102	2948	2906

DISCUSSION

Our findings indicates that consumption of Ovaltine have an effect on systolic and diastolic component of blood pressure. Results for Ovaltine (Milo) revealed that there was 5.21mmHg(4.42%) p value< 0.001 and 4.24mmHg (5.47%) p value< 0.001 increase in systolic and Diastolic component of blood pressures respectively after an interval of 30 minutes, whereas coffee has shown minute change in systolic and diastolic component of blood pressure 0.02mmHg (0.017%) p value> 0.05 and 1.39mmHg (1.83%) p value< 0.001 respectively after a interval of 30 minutes of coffee intake. In France and Algeria a study included thousand number of subjects had shown a 2 to 3 mmHg increase in systolic and diastolic component of blood pressure.[12,13] Several studies have indicated on that cocoa intake (e.g., chocolate) decreases CVD mortality.[14,15] Ovaltine contain malt extract, the effect of increase in blood pressure is true for malt beverages or any alcoholic drinks. Beverages that has excessive calories causes weight gain, which is considered as a risk factor for hypertension.[16] gluten protein resulted in higher 24 hr systolic BP by 2.3 mmHg (p = 0.003), a higher daytime systolic BP by 3.4 mmHg (p = 0.0002) and a higher daytime diastolic BP by 1.4 mmHg (p = 0.008).[17] The study conducted in has shown that the coffee and ovaltine (Milo) both increases heart rate up to 5.48 (6.76%) p value 0.003 and 5.29 (6.75%) p value 0.02 respectively.[18] This elevation in systolic and diastolic pressure has reflected that patients with ischemic heart disease or other heart diseases should avoid ovaltine and coffee as in case of such illness our prime objective is to minimize the work load

on heart, in contrary coffee may enhance work load on heart.[19] The results of our study has shown similar finding to some extent in comparison to Robertson et al.[20]

CONCLUSION

Ovaltine (Milo) intake leads to modest increases in systolic and diastolic blood pressurewhile coffe has shown a minute change. Our results provide support for a relationship between ovaltine (Milo) consumption and higher blood pressure. Safe usage of this beverage need to be evaluated especially in those who already have high blood pressure. In addition, there is a need for more clinical research required to formulate guide lines for safe consumption of Ovaltine (Milo) in patients with high blood pressure and other heart diseases.

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