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EFFECT OF OBESITY ON SOME HEMATOLOGICAL AND BIOCHEMICAL VARIABLES

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ABSTRACT : This study included the effect of obesity on some hematological variables, which is the total number of white blood cells and lymphocytes, and the effect of obesity on some chemical variables, which are the amount of blood sugar, accumulated sugar, blood cholesterol level and triglycerides. The study consisted of 40 patients suffering from obesity, divided into 20 men and 20 women, and twenty were in control and blood and biochemical tests were performed for all treatments and control, Blood tests were performed using a CBC machine and included total WBC and lymphocyte counts, Included on many tests are serum cholesterol and triglyceride, RBS, HBA1c, using the Full Auto device. The results showed that there is a decrease in the number of white blood cells and lymphocytes in obese people compared to healthy people, as well as a significant increase in blood sugar and cumulative sugar levels in obese people compared to healthy people and an increase in triglyceride and cholesterol levels in obese people. Compared to healthy people.

Key words : Obesity, hematological and biochemical variables.

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INTRODUCTION

Obesity is the direct end result of eating greater energy than the physique can burn or use on a normal basis (Asai, 2020). As everybody knows, the physique shops the more energy and fat, and with the more energy bump off each day, the physique continues to accumulate extra fats stores, which leads to weight problems - and in the most extreme instances - to morbid obesity (Cani and Hul, 2020). Obesity signs and symptoms encompass measurable standards designed to examine physique fats percentage. These money owed are used by using a fitness care company when diagnosing obesity. The most important way to evaluate the degree of weight obtain with the severity of weight problems is a precise size device known as the physique mass index - BMI (El-Missiry and Othman, 2020). According to the World Health Organization, greater than 340 million adolescents and children between the a while of 5 and 19 have been regarded obese or chubby in 2016 (Heart, Cme and Ecme, 2020). Boston Children's Hospital says in the previous 30 years that the Centers for Disease Control and Prevention reviews that the fee of childhood weight problems has tripled (Lessan *et al*, 2020). Morbid weight problems is a developing fitness issue in many developed international locations in the world today, especially in the United States of America, when a character weighs forty five kg over the perfect physique weight, with a BMI of forty or greater (in the overweight category) Extremely Obese category) it is regarded pathologically fat (Liu *et al*, 2020). And a character who suffers from fitness prerequisites associated to weight problems (such as excessive blood strain or diabetes) with a BMI of 35 or more, is viewed to be obese, and morbid weight problems can additionally lead to a man or woman struggling from every day things to do such as walking, and it can Impairment of bodily features such as breathing. It additionally places a man or woman at excessive danger for many different serious fitness conditions (Loria *et al*, 2018; Xie *et al*, 2020; Ye *et al*, 2020).

MATERIALS AND METHODS

The study consisted of 40 patients suffering from obesity, divided into 20 men and 20 women and twenty were in control, and blood and biochemical tests were performed for all treatments and control.

Hematological test

Blood tests were performed using a CBC machine and included total WBC and lymphocyte counts. (Syndrome and Compendium, 2020; To and Editor, 2020).

Biochemical test

Included on many tests are serum cholesterol and triglyceride, RBS, HBA1c, using the Full Auto device (Pneumonia *et al*, 2020; Wei *et al*, 2020; Zhou, Lv and Wang, 2020).

RESULTS AND DISCUSSION

The estimate is that between 40%-70% of obesity can be attributed to various genetic factors, not to environmental factors or lifestyle, as research on mice has shown, the presence of 5 genes associated with appetite, these genes are the ones that lead to obesity. These genes are also present in humans. One of the primary genetic factors in obesity is the hormone leptin. Table 1 shows the effect of obesity on some hematological variables, which include the total and differential counts of white blood cells, as there were significant differences between the total white blood cell count and the lymphocyte white blood cell count. Lymphocytic blood, which indicates that obese people are less immune and more susceptible to disease.

Table 1 : The effect of obesity on total and differential white blood cell counts.

Descriptive Statistics				
Dependent Variable: concentration				
Male and female	**Hematological test**	**Mean**	**Std. Deviation**	**N**
Male	WBC	4490.00	578.216	10
	Lymphocyte	1405.90	169.133	10
	Total	2947.95	1635.540	20
Female	WBC	4490.00	578.216	10
	Lymphocyte	1405.90	169.133	10
	Total	2947.95	1635.540	20
Control	WBC	7910.00	657.352	10
	Lymphocyte	2660.00	195.505	10
	Total	5285.00	2734.242	20
Total	WBC	5630.00	1740.818	30
	Lymphocyte	1823.93	625.438	30
	Total	3726.97	2316.189	60

Table 2 shows the analysis of variance table for the effect of obesity on some hematological variables where

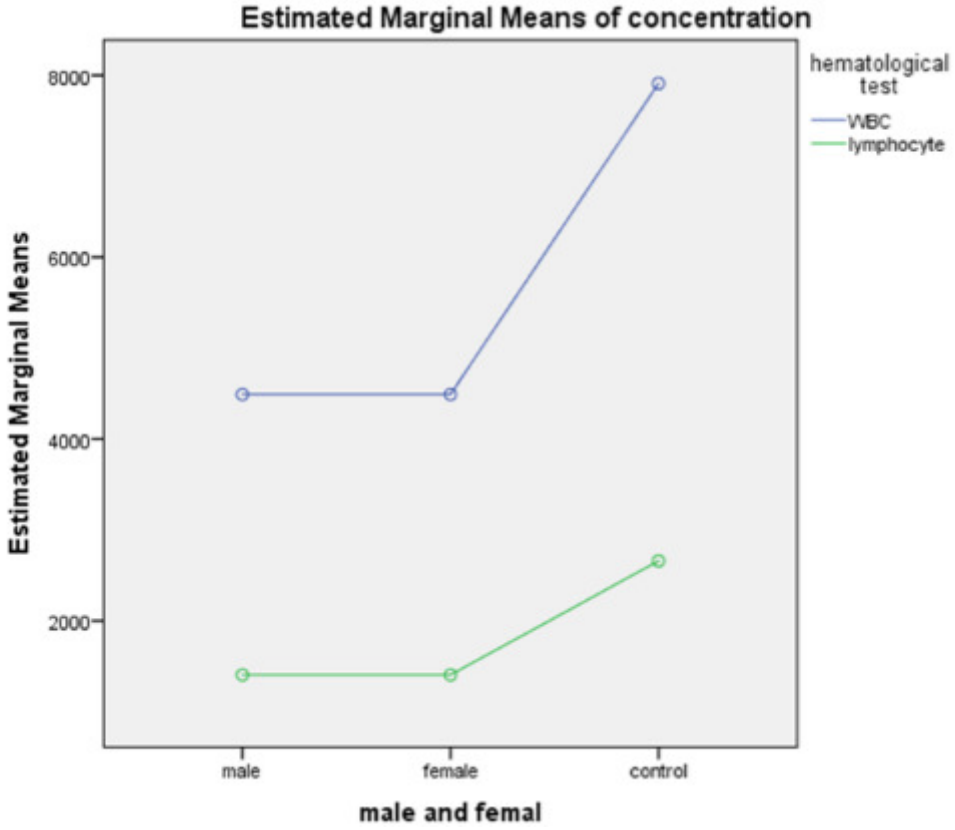

Fig. 1 : Effect of obesity on total and differential white blood cell counts.

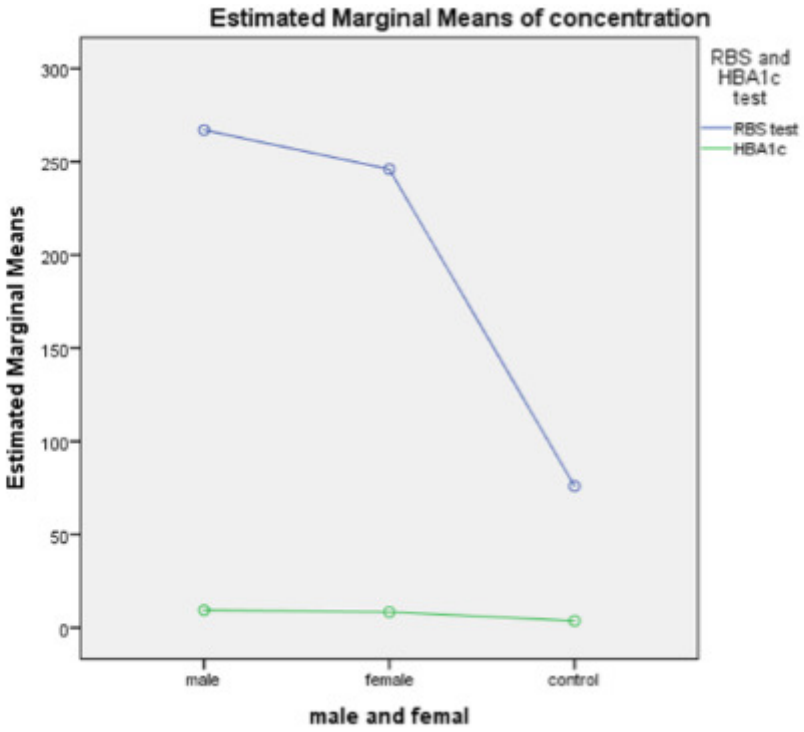

Fig. 2 : Effect of obesity on Random blood sugar and HBA1c.

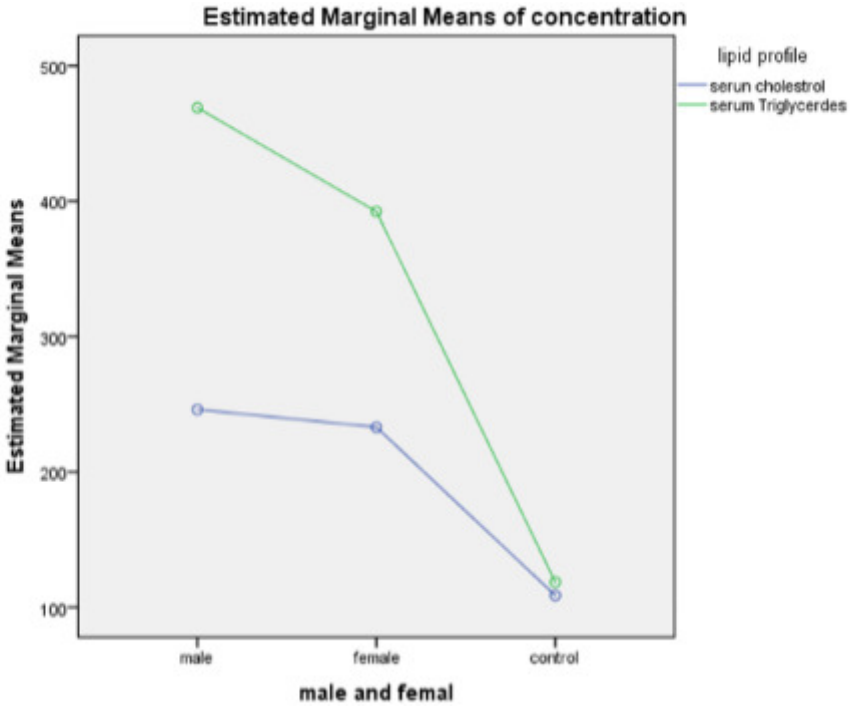

Fig. 3 : Effect of obesity on serum cholesterol and triglycerides.

there were significant differences between the treatments compared to the control. It was also noted that there were no significant differences between men and women.

Recent reports indicate that there is a link between weight gain and the occurrence of insulin resistance. Weight gain increases the chances of developing type 2 diabetes by 80%-85%. With weight gain, the endoplasmic reticulum (the inner membrane lining of cells) sends a signal to calm the insulin receptors. In cells, this results in high blood glucose concentrations and thus type 2 diabetes. Although, research has recently demonstrated the role of obesity in the occurrence of type 2 diabetes, obesity can lead to the occurrence of type 2 diabetes indirectly by developing high blood pressure and increasing the level of triglycerides in the blood, both of which lead

Table 2 : ANOVA table for effect of obesity on total and differential white blood cell counts.

Tests of Between-Subjects Effects					
Dependent Variable: concentration					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	305753264.100[a]	5	61150652.830	306.722	.000
Intercept	833416832.100	1	833416832.100	4180.281	.000
Gender	72824036.030	2	36412018.020	182.637	.000
Test	217292152.100	1	217292152.100	1089.901	.000
gender * test	15637076.030	2	7818538.017	39.216	.000
Error	10765905.800	54	199368.626		
Total	1149936002.000	60			
Corrected Total	316519169.900	59			

a. R Squared = .966 (Adjusted R Squared = .963)

Table 3 : Effect of obesity on Random blood sugar and HBA1c.

Descriptive Statistics				
Dependent Variable: concentration				
Male and female	**RBS and HBA1c test**	**Mean**	**Std. Deviation**	**N**
Male	RBS test	267.00	57.552	10
	HBA1c	9.40	1.578	10
	Total	138.20	137.959	20
Female	RBS test	246.00	61.137	10
	HBA1c	8.40	1.265	10
	Total	127.20	128.948	20
Control	RBS test	76.00	9.661	10
	HBA1c	3.70	.675	10
	Total	39.85	37.683	20
Total	RBS test	196.33	98.907	30
	HBA1c	7.17	2.793	30
	Total	101.75	117.940	60

for men of sugar was 276 and women 246. The cumulative sugar for men 9 and women 8 compared to control 76 for sugar 3.7 for cumulative sugar, which indicates to the role of obesity in causing diabetes in some people.

Table 4 shows the analysis of variance table for the effect of obesity on the infection of some people with type 2 diabetes, as there were significant differences in the increase in blood sugar level for all treatments compared to control and no significant differences were observed between the same treatments.

Triglycerides are a fatty substance made up of 3 fatty acids, each of which is linked to the cholesterol molecule, and they are obtained from food or synthesized in the liver. The excess is kept in the body. High triglycerides have been linked to heart disease, but sometimes it is easy and it is treated with lifestyle changes or with the help of a doctor. Triglycerides and cholesterol are separate types of fats that circulate in the blood. Throughout the body with the help of proteins that

Table 4 : ANOVA table of effect of obesity on Random blood sugar and HBA1c.

Tests of Between-Subjects Effects					
Dependent Variable: concentration					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	756352.350[a]	5	151270.470	126.978	.000
Intercept	621183.750	1	621183.750	521.428	.000
Gender	116158.300	2	58079.150	48.752	.000
Test	536760.417	1	536760.417	450.562	.000
gender * test	103433.633	2	51716.817	43.412	.000
Error	64330.900	54	1191.313		
Total	1441867.000	60			
Corrected Total	820683.250	59			

a. R Squared = .922 (Adjusted R Squared = .914)

to the development of type 2 diabetes. Table 3 shows the effect of obesity in people with type 2 diabetes, as we notice significant differences in the increase in sugar and cumulative sugar compared to control, as the average

transport fats (lipoproteins). Table 5 shows the effect of obesity in increasing the levels of triglycerides and cholesterol in the blood, where the cholesterol level in men reached 246 and in women 233, while the

Table 5 : Effect of obesity on serum cholesterol and triglycerides.

Descriptive Statistics				
Dependent Variable: concentration				
Male and female	**Lipid profile**	**Mean**	**Std. Deviation**	**N**
Male	Serum cholesterol	246.00	23.664	10
	Serum Triglycerides	469.00	54.252	10
	Total	357.50	121.433	20
Female	Serum cholesterol	233.00	34.657	10
	Serum Triglycerides	392.30	51.255	10
	Total	312.65	92.149	20
Control	Serum cholesterol	108.70	15.592	10
	Serum Triglycerides	118.60	16.728	10
	Total	113.65	16.538	20
Total	Serum cholesterol	195.90	67.706	30
	Serum Triglycerides	326.63	158.792	30
	Total	261.27	137.812	60

Table 6 : ANOVA table of effect of obesity on serum cholesterol and triglycerides.

Tests of Between-Subjects Effects					
Dependent Variable: concentration					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	1049853.133[a]	5	209970.627	160.395	.000
Intercept	4095616.267	1	4095616.267	3128.609	.000
Gender	673835.633	2	336917.817	257.369	.000
Test	256368.067	1	256368.067	195.838	.000
Gender * test	119649.433	2	59824.717	45.700	.000
Error	70690.600	54	1309.085		
Total	5216160.000	60			
Corrected Total	1120543.733	59			

a. R Squared = .937 (Adjusted R Squared = .931)

triglycerides in men reached 469 and in women 392 compared to control 108 and 118, respectively, where there were significant differences between the treatments and the control. To increase fat in obese people.

Table 6 shows contrast analysis of the effect of obesity on lipid levels in obese people, where there were significant differences between the treatments and control, and there were no significant differences between the treatments themselves, meaning there were no significant differences between men and women.

CONCLUSION

There is a decrease in the number of white blood cells and lymphocytes, a significant increase in blood sugar and cumulative sugar levels and an increase in triglyceride and cholesterol levels in obese people compared to healthy people.

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