THE EFFICACY OF PROBIOTICSBENEFITS ON HEALTH AND MENTAL PERFORMANCE OF FEMALE COLLEGE STUDENTS

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Abstract - Probiotics are microorganisms that are believed to provide health benefits. The term came into use after 1980.The introduction of the concept is attributed to (Elie Metchnikoff), who suggested that the dependence of intestinal microbes on the food, makes it possible to replace harmful microbes by useful ones. The object of the study is to access the efficacy of probiotics benefits on health and mental performance of female college students.This study included 20 female college students, age ranged 20-23y. ingestedbifido bacterium one capsule daily for 6 weeks, and 20 female college students, age 19-22y. ingested placebo once daily for 6 weeks. 5ml of venous blood were collected from all fasting subjects into a plain tube , after centrifuge the sera were stored at (-20 ℃) until analysis.Blood samples were collected pre-post experiment.For assessment of:MDA, Cholesterol, HDL, LDL, TG, C-RP, GSH, Folic Acid, Vit A, Serotonin and Glutamine. Results revealed that there are significant changes in different tested variable post probiotics administration while non-significant changes of tested variables post placebo administration. In conclusion, probiotics can induce immune response, while suppress free radical and bad lipid profile. Also, it can affect brain and muscle performance positively, together with increased Vit A, Folic Acid and Vit B_{12} synthesis, and act as a preventive the rapeutic agents for diseases.

Keywords - Probiotics, Lipogram, Oxidant and Antioxidant, Vitamines, Mental Performance .

I. INTRODUCTION

Probiotics are live microorganisms that are intended to have health benefits when consumed or applied to the body. They can be found in yogurt and other fermented foods, dietary supplements and beauty products (Mary, 2016). Other dietary supplements are also used for general health including vitamin and mineral complex, antioxidants, trace elements, immune boosters, amino acids, cardio vascular tonics, adaptogens and bifidobacteria (Hamed, 2014).

Researchers reported about the immunity benefits of probiotics and that it may produce some Vitamins, reduces allergic, promote detoxication, safeguards against infection also optimize digestion and prevent lactose, improve absorption and promotes women and men health, prevents urinary tract infection. (Markus, 2018.)

II. AIM OF THE STUDY

Is to investigate the efficacy of probiotics benefits on health and mental performance of female college students.

III. SUBJECTS AND METHODS

The study included 40 female college students of Port-Said University.

They were divided into 2 groups:
Group1: it included 20 female college students with age range (19-22y) ingested placebo tablets once daily for 6 weeks.

Bifidobacterium is a genus of gram positive, non-motile, often branched anaerobic bacteria; they are inhabitants of gastro intestinal tract, vagina and mouth. They are labeled based on the colony forming unit (CFUs): probiotic must be of good quality, properly processed and stored. All participants did not receive any medication or supplementation with antioxidants or Vitamins.All participants were briefed on the experiment protocol before giving written informed consent. All procedures were approved by Port-Said University Review Board.

Sample collection and assay: five ml of venous blood were collected from all fasting subjects into a plain tube, let to stand to clot and serum, was separated in aliquots after centrifugation and stored at (-20 ℃) until analysis of:

- MDA assay .
- GSH assay
- Cholesterol assay.
- Folic acid and Vit B_{12}assay .
- HDL assay .
- Vit A assay using .
- LDL assay .
- Serotonin assay using Elisa technique.
- TG assay .
- Glutamine assay using Elisa technique.
- C-Reactive protein .
- Variables determined in special lab .

Blood sample collection of the control (1) and the experimental group (2) occurred pre and post experiment.

IV. STATISTICAL ANALYSIS

The SPSS was used for data analysis; quantitative data were analyzed by the students tests for comparison between two groups. Data were represented as mean ±SD P Values were significant $P < 0.05$.

V. RESULTS

Variables	Control Group (1)		Exp. Group (2)	
	Pre	Post	Pre	Post
	M ± SD	M ± SD	M ± SD	M ± SD
Serotonin (mg/ml)	157.2 ± 8.5	160.1 ± 7.6	162.2 ± 9.3	219.8 ± 11.2 *
Glutamine (uM)	539.9 ±20.1	542.3 ± 12.5	548.2 ± 24.3	623.4 ± 26.4 *

Table(1) - Serotonin and glutamine levels pre-post placebo and probiotics ingestions of control (1) and experimental group (2) of female college students.

Variables	Control Group (1)		Exp. Group (2)	
	Pre	Post	Pre	Post
	M SD	M SD	M SD	M SD
C-RP (mg/ml)	2.9 ± 0.5	2.6 ± 0.6	3.4 ± 0.68	1.02 ± 0.39 *
Folic Acid (mg/ml)	3.9 ± 1.2	3.8 ± 1.4	4.2 ± 1.3	7.4 ± 1.6 *
Vit A (mg/dl)	19.1 ± 1.8	20.2 ± 2.2	19.7 ± 2.9	36.8 ± 3.2 *
Vit B_{12} (mg/dl)	0.03 ± 0.004	0.02 ± 0.005	0.02 ± 0.003	0.43 ± 0.005 *

Table(2) C-RP, Folic acid, Vit A and Vit B_{12} pre-post Placebo and probiotics ingestion of control (1) and experiment group (2) of female college students

Variables	Control Group (1)		Exp. Group (2)	
	Pre	Post	Pre	Post
	M SD	M SD	M SD	M SD
Cholesterol (mg/dl)	201.6 ± 10.6	198 ± 9.8	214.1 ± 11.4	192.3 ± 10.2 *
HDL (mg/dl)	45.7 ± 11.1	46.3 ± 9.8	44.7 ± 5.1	49.22 ± 6.4 *
LDL (mg/dl)	166.8 ± 11.3	165.3 ± 10.5	169.4 ± 12.6	138.1 ± 11.8 *
TG (mg/dl)	146.3 ± 15.1	150.3 ± 13.6	141.7 ± 13.3	126.2 ± 10.6 *
MDA (Mmol/L)	2.1 ± 0.23	2.3 ± 0.25	1.9 ± 0.45	1.1 ± 0.32 *
GSH (mg/dl)	80.2 ± 9.8	81.2 ± 12.6	78.5 ± 9.5	116.2 ± 9.8 *

Table(3) - Lipogram, mda, and glutathione (GSH) concentrations pre-post placebo and probiotics ingestions of control and experimental group (2) of female college students.

VI. DISCUSSION

Table(1) shows that probiotics supplymentation significantly increase glutamine and serotonin, which indicate the effect of probiotics on central nervous system which induce improvement in mood of the participant of the study, placebo ingestion shows non-significant changes in the serotonin and glutamine concentrations.

Researchers supported the view that probiotics stimulate increase glutamine and serotonin which in turn elevate mood, wellbeing of the subjects, maintain nervous system health also maintain muscle mass and boosts immune system (Bouthegourd et al, 2002).(Hatfield, 2013) reported the beneficial effects of increasing glutamine concentration in the blood as it affect immunity positively, help growing muscle and decreases muscle breakdown due to growth hormone release together with enhancing glycogen storage, promotes healing and aids recovery from exercise.(Guyton and Hall, 2006) stated that serotonin is present in different part of the body, such as brain stem, hypothalamus, neocortex limbic system, affecting brain and behavior and stimulate mood and (g) intelligence.

The reported data shows that probiotics beneficial effects in boosting immunity, brain and muscle functions and growth by the stimulatory effect of glutamine and serotonin. It is of importance to say that glutamine concentration must be in a high level as it is used at a high rate by cells of the immune system even when they are quiescent as reported by (Mac Leod et al, 1993), they also added that the immune response to bacteria must be rapid, because glutamine utilization must be high, so the glutamine decreased level could induce suppression of the immune system.(Murray et al, 2009) reported that serotonin function as a avasodilator and stimulator of smooth muscle concentration in addition to its action in elevation of mood and may induce "general intelligence and help the wellbeing of the subjects".Table(2) shows the impact of probiotic administration on C-RP, Folic Acid, Vit A, Vit B12 on participants, which reveals a significant decreased C-RP levels within normal concentration and in the same line significant increased in Folic Acid, Vit A, Vit B12 concentrations. While in case of control group, non-significant changes were noted. These effects were also reported by (Mary, 2016)

As for Vit B12 (anti pernicious anemia) which is present in foods of animal origin only and obtain via synthesis by bacteria in soil, water and intestine. (Ghanem, 2019) reported that C-RP is one type of protein, which act as a marker of inflammation, secreted by the liver, with a normal concentration in the blood less than 6mg/ml and in case of disease may reach the highest level after 48hours, while C-RP concentration is not affected by anemia, protein levels, age or sex of the subject, he added that the most important therapy for C-RP reduction is a balanced food, special supplement such as probiotic and regular exercise.

Table(3) shows that probiotic administration induce a significant increased HDL, and GSH concentrations while significantly decreased LDL, TG and MDA concentrations which indicated that probiotics induce a positive effect in relation to lipogram tested together with antioxidant effect and immune action. The result of the data indicated also that probiotics may be used in case of obesity and in some diseases together with its effect in elevating the immune system.

VII. CONCLUSION

In conclusion, it has been shown that probiotics can induce immune response, while suppress free radical and bad lipid profile together with inflammation. The results of the present study suggested also a significantly increased levels of serotonin and glutamine which affect brain and muscle performance.

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