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THE INFLUENCE OF ENERGY-RESTRICTED ANTI-INFLAMMATORY DIET ON INNATE IMMUNE RESPONSE IN PATIENTS WITH OBESITY



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The current obesity pandemic and related health complications severely impair the quality of life and significantly increase the burden of health care costs. Obesity causes chronic low-grade inflammation, which may cause chronic metabolic disease and complications, and may be accompanied by the activation of the immune system. Activation of the immune system may have a key role in the pathogenesis of metabolic disorders related to obesity. Adipose tissue disorders cause changes in adipose tissue distribution and function, with significant effects on cytokines, chemokines, hormone expression, and the composition of immune cell populations present in adipose tissue. Diet can influence immune system functioning and inflammatory response modulation. This study aimed to analyze the association between diet inflammatory potential, inflammation, and the innate immune response of obese people. In six months, 81 patients with obesity were monitored during energy-restricted anti-inflammatory diet nutritional intervention (intervention group; IG) and during energy-restricted Clinical Hospital Center Rijeka standard nutrition education protocol with Mediterranean diet characteristics (control group; CG). The IG group received recommendations to consume more food with anti-inflammatory potential than CG group. The inflammatory potential of the participant's diet was assessed with the Dietary Inflammatory Index (DII[®]). Both studied groups statistically significantly reduced markers of inflammation, hs-CRP, IL-6, and TNF- α . The innate immunity (proportion of NK and NKT cells) was significantly decreased in the intervention group. Intervention with an anti-inflammatory diet showed the greatest reduction of these parameters in participants with the highest obesity degree. The use of anti-inflammatory dietary components, besides dietary energy restriction, has a significant impact on the improved inflammatory and immune status of people with obesity.





Table 1. The change of serum inflammatory markers and immunophenotypic profile of lymphocyte subpopulations among 81 patients with obesity after 6 months of energy restriction nutritional intervention

	Intervention group; IG; n=42				Control group; CG; n=39			
Variables	Study beginning Study end Change (%) P-value Study beginning Study end Change (%)	P-value						
	Average	Average	(70)		Average	Average	(70)	
C-reactive protein (CRP) (mg/l)	6.28	4.43	-29.46	0.003 ^a	6.78	3.92	-42.18	0.010 ^b
Interleukin 6 (II-6) (pg/ml)	0.77	0.63	-17.56	0.013 ^a	1.72	1.55	-9.82	0.346 ^a
Tumor necrosis factor alpha (TNF-α) (pg/ml)	0.38	0.25	-35.59	0.002 ^a	1.34	0.54	-60.09	<0.001 ^a
T lymphocytes (%)	68.40	67.17	-1.72	0.220 ^a	67.03	64.37	-3.23	0.059 ^a
T helper lymphocytes (%)	41.35	43.53	6.03	<0.001ª	48.39	50.12	4.38	0.009 ^a
T cytotoxic lymphocytes (%)	25.79	24.96	-0.23	0.303 ^b	21.17	20.47	-4.71	0.042 ^b
Natural killer cells (NK) (%)	23.94	20.32	-15.56	<0.001ª	20.14	16.52	-25.71	0.671ª
Natural killer T cells (NKT) (%)	7.39	5.54	-35.42	<0.001 ^a	8.86	6.20	-28.61	0.488ª
B lymphocytes (%)	10.22	11.57	15.06	0.002 ^a	16.67	16.86	0.13	0.014 ^a
CD5 molecule (%)	64.05	64.36	0.07	0.608 ^b	70.51	68.20	-2.67	0.078 ^b
Activision B lymphocytes (%)	2.81	2.64	2.36	0.359ª	4.99	4.27	4.44	0.019ª
Dietary Inflammatory Index, DII®	-0.53	-2.03	283.02	0.002 ^a	-0.23	-0.30	30.43	0.725ª

* A change assessed with z-score; a P <0.05 tested with Student t-test for dependent samples; P <0.05 tested with Wilcoxon z-test for dependent samples

 Table 2. The reduction od C-reactive protein among 81 patients with obesity

 after 6 months of energy-restricted nutritional intervention

Intervention group; IG;	p- value*	Control group; CG;	p- value*	
n=42 -20.80	0.280	-32.68	0.099	
-54.19	0.023	-51.70	0.251	
-53.51	0.046	-52.68	0.045	
	Intervention group; IG; n=42 -20.80 -54.19 -53.51	Intervention p- group; IG; value* n=42 0.280 -20.80 0.280 -54.19 0.023 -53.51 0.046	Intervention p- Control group; IG; value* group; CG; n=42 n=39 -20.80 0.280 -32.68 -54.19 0.023 -51.70 -53.51 0.046 -52.68	

Literature

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