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The Effect of The ALCAT Test Diet Therapy for Food Sensitivity in Patient's With Obesity

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INTRODUCTION

Obesity is an increasing health problem worldwide. The World Health Organization predicts that by 2015, 2.5 billion people will be overweight (body mass index (BMI) ([weight (kg)/ (height (m)) 2]) >25, and 700 million adults will be obese (>30).[1] No universally accepted definition for obesity exists but there is general consensus that BMI levels above 25% for adults are considered overweight and over 30% considered obese. Adult men and women should maintain BMI levels between 18% and 24.5%.[2] Excess weight is a major risk factor for a wide range of chronic diseases and exacerbates hypertension, dyslipoproteinemia, osteoarthritis and other musculoskeletal problems.[3]

According to the world Health Organization (WHO) instances of obesity are on the increase in the United Arab Emirates. In 2005, over 75% of women over 30 in the United Arab Emirates were classified as overweight, with similar estimates for men.[4] The adverse health outcome of excess weight places an increasing burden on our health care system.[5,6] Being overweight is highly resistant to intervention[7] and it is doubtful that we are any closer to a solution today than we were decades ago. In fact, we appear to be moving away from, rather than towards, the national objectives according to data from National Health and National Examination Survey, NHANES III.[8] Until now, no intervention has been shown consistently to achieve true weight control. Although the precise reason for the high relapse rate is not known, the stunning uniformity of these findings, which now extend over nearly five decades, should give pause to anyone who proposes to treat, much less cure, obesity.[9] However, recent advances in technology show that obesity is associated with a low-grade inflammation of white adipose tissue stemming from the chronic activation of the innate immune system leads to further weight gain, insulin resistance and diabetes.[10] As food intolerance/sensitivity is one possible cause of this low-grade inflammation, we decided to investigate the hypothesis that the adherence to a food intolerance elimination diet improves weight in refractory patients. The method used for determining the diet related triggers of this inflammation in this study is the ALCAT test.

THE ALCAT TEST

The ALCAT test uses a specially designed particle counter (hematology analyzer with an automated assay sampler) and food test agents to semi-qualitatively measure white blood cell reactivity, if any, to each agent analyzed. The degree of reactivity is determined by comparing a baseline distribution curve (of the white cells) against the distribution curve generated by the analysis of each test agent/blood sample, and calculating the absolute differences between the curves and the standard deviation (SD). Any reactivity under SD1 will be considered as non-reactive (NEG); reactivity between SD1 and SD2 will be considered as marginally reactive (RANGE 1+); reactivity between SD2 and SD3 will be considered reactive (RANGE 2+); and finally, reactivity above or equal to SD3 will be considered markedly reactive (RANGE MPOS).

There is evidence demonstrating the ALCAT test to be effective in improving body mass index (BMI) and/or scale weight. According to a Baylor University study, "As compared to following a plan of their own choosing, participants who followed the ALCAT plan achieved rather dramatic

changes in their body composition." This experiment showed that 98% of the subjects following the ALCAT plan either lost scale weight or improved their body composition.[11] Dr. J.R. Cabo-Soler, Chief of Biochemistry at the University of Valencia, reported that iso-caloric food elimination diets, based on ALCAT test results, promoted enhanced weight loss, comprised more of adipose tissue, rather than muscle mass, as determined by DEXA studies in a population of refractory weight loss subjects.[12] The ALCAT test has demonstrated a reproducibility of 94.94%, according to a trial by Steinman et. al at the University of Cape Town.[13] 92.0678% reproducibility was reported by Neetling et. al. at the University of the Free Orange State, also in South Africa, which makes it an acceptable screening model for intolerance testing in humans. In Addition, a Norwegian study reported the ALCAT test to be >90% reproducible.[16,14] Fell et. al reported an 83.4% correlation between ALCAT test results and double blind oral challenges as determined by careful clinical evaluation in statistically significant number of patients exhibiting food sensitivity related symptoms, such as migraines, irritable bowel syndrome, eczema and other conditions, that are often observed as co-morbidities in obese patients.[15]

Despite mounting evidence of the efficacy of the ALCAT test in reducing obesity and the overall activation of the immune system, there have been no studies of the weight loss benefits of the ALCAT test reported for an Arab population. The purpose of this study was, therefore, to determine the effectiveness of the ALCAT test as a weight loss tool in Arab patients who had experienced difficulty achieving goal weight by calorie restriction.

PATIENTS, MATERIALS AND METHODS

This study was designed to determine whether people who could not lose weight on a low calorie diet could achieve their weight loss using the results from ALCAT test. A group of 27 patients with 14 males and 13 females with mean age of 42.77± 6.23 Years and with mean height of 168.66 ± 2.09 cm with obesity who had difficulty losing weight when they adhered to a reduced calorie diet were evaluated for specific white blood cell food induced reactions. (Table 1) Patients were exhibiting multiple symptoms including: obesity, gastrointestinal reflux, chronic fatigue, headache and other chronic disorders associated with food sensitivities.

Citrated blood is diluted 1 in 5 with buffer and approximately 90µl is added to each test agent well. The test agents are diluted preparations of food extracts (standardized for potency) bonded to the bottom of the well. Following 45 minutes incubation at 37 ° C with constant agitation, the test agents are incubated for a further 30 minutes at room temperature. Red cells are lysed by adding an azide free, electrolytic solution containing an lytic reagent, "ALCALyse", supplied by Cell Science Systems, Ltd. Each test agent is then analyzed in sequence using the ROBOCat II particle counter (also manufactured by Cell Science Systems, Ltd.) with one control for every 10 food items tested. The 100 foods tested are shown in Table 2.

The basis of the ALCAT test is the measurement of changes in white blood cell size/volume following incubation with food and other test agents using the ROBOCat II linked to a computer. Contact between foreign entities and whole blood can cause autolysis, a phenomenon known as autocytotoxicity, and other cellular reactions.

There are three mechanisms which cause this phenomenon, and one does not require the priming of cells in vitro by either antibody or antigen[17].

Table 1: Partial list of symptoms associated with food intolerance

Depression	ADHD	Urticaria
Perennial rhinitis	CFS	Fibromyalgia
Asthma	Inflammatory Bowel	Arthritis
Eczema	Irritable Bowel	Diarrhea
Dermatitis	Migraine Headache	Infertility
Autism	Otitis Media	GI Ulcer

Table 2: List of Food agents used by the ALCAT test in 27 patients with obesity.

Food allergens	Food allergens	Food allergens	Food allergens
Almond	Corn	Lemon	Rice
Apple	Courgette	Lentil bean	Salmon
Apricot	Cow milk	Lettuce	Sardine
Banana	Crab	Lima bean	Sesame
Barley	Cucumber	Lobster	Shrimp
Basil	Curry	Mango	Soybean
Bay leaf	Date	Mint	Spinach
Beef	Dill Mix	Mushroom	Strawberry
Beet sugar	Duck	Mustard	String bean
Black pepper	Egg white	Nutmeg	Sunflower
Broccoli	Egg yolk	Oat	Sweet potato
Cabbage	Eggplant	Olive	Tea
Cane sugar	Garlic	Onion	Thyme
Cantaloupe	Ginger	Orange	Tomato
Carrot	Gliadin	Oregano	Tuna
Cashew	Gluten	Papaya	Turkey
Cauliflower	Goat milk	Parsley	Turmeric
Cayenne pepper	Grape	Peach	Turnip
Celery	Grapefruit	Peanut	Vanilla
chick pea	Green pepper	Pear	Walnut
Chicken	Green pea	pineapple	Watermelon
Cinnamon	Haddock	Plum	Wheat
Cocoa	Hazelnut	Rabbit	White potato
Coconut	Honey	Radish	Yeast (Baker)
Coffee	Lamb	Raspberry	Yeast (Brewer)

It was on this basis that an automated method was sought which would not only be reproducible and objective but would directly correlate with in vivo food challenge.

The computer is programmed to compare cell cultures incubated in the presence of food agents and measure a shift in cell volumes related to exposure to the test agent.

In keeping with standard laboratory practices, deviation in the test histograms, when compared with a control (identically treated but lacking the test agent) that exceeds one standard deviation (SD) is regarded as a positive reaction, and the patient is advised to avoid that food.

RESULTS

Table 3: List of Food agents used by the ALCAT test in 27 patients with obesity.

Patients. No	Sex	Age (years)	Height (cm)	Body Weight (kg)	
				Before	After
1	M	46	165	90	75
2	F	40	167	80	70
3	F	41	169	83	70
4	M	40	171	103	84
5	F	43	170	106	76
6	F	39	170	96	78
7	F	48	172	76	60
8	M	42	169	71	64
9	M	40	168	86	70
10	M	33	165	89	70
11	M	43	167	93	77
12	F	40	170	84	68
13	F	45	168	90	74
14	M	49	173	85	73
15	M	51	167	96	78
16	F	53	171	112	85
17	M	48	170	103	86
18	M	56	169	96	80
19	M	40	170	81	67
20	F	43	165	82	70
21	F	34	169	86	71
22	M	30	170	89	76
23	F	46	168	93	80
24	M	50	167	104	85
25	M	43	166	110	80
26	F	38	168	100	80
27	F	34	170	80	67
Mean ± SD		**42.77± 6.23**	**168.66 ± 2.09**	**91.37 ± 10.56**	**74.6 ± 6.76**
The p-values derived from Student't'-tests. *P < 0.001 is highly significant*					

Table 4: List of Food agents used by the ALCAT test in 27 patients with obesity.

Patients. No	Sex	Age (years)	Height (cm)	Total Body Fat (%)	
				Before	After
1	M	46	165	38	29
2	F	40	167	30	24
3	F	41	169	26	20
4	M	40	171	43	26
5	F	43	170	36	24
6	F	39	170	33	21
7	F	48	172	26	19
8	M	42	169	25	20
9	M	40	168	30	21
10	M	33	165	31	20
11	M	43	167	40	31
12	F	40	170	38	29
13	F	45	168	43	32
14	M	49	173	38	30
15	M	51	167	45	34
16	F	53	171	53	40
17	M	48	170	49	40
18	M	56	169	43	32
19	M	40	170	30	20
20	F	43	165	33	22
21	F	34	169	31	23
22	M	30	170	39	26
23	F	46	168	40	32
24	M	50	167	42	34
25	M	43	166	45	39
26	F	38	168	40	33
27	F	34	170	36	26
Mean ± SD		**42.77± 6.23**	**168.66 ± 2.09**	**37.1 ± 7.16**	**27.66 ± 6.52**
The p-values derived from Student't'-tests. *P < 0.001 is highly significant*					

Table 5: The Body Mass Index of 27 patients before and after 12 weeks of following the ALCAT diet plan.

Patients. No	Sex	Age (years)	Height (cm)	BMI {weight (kg)/height (m2)}	
				Before	After
1	M	46	165	33.1	27.5
2	F	40	167	28.7	21.5
3	F	41	169	29.1	24.5
4	M	40	171	35.2	28.7
5	F	43	170	36.7	26.3
6	F	39	170	33.2	27.0
7	F	48	172	25.7	20.3
8	M	42	169	24.9	22.4
9	M	40	168	30.5	24.8
10	M	33	165	32.7	25.7
11	M	43	167	33.3	27.6
12	F	40	170	29.1	23.5
13	F	45	168	31.9	26.2
14	M	49	173	28.4	24.4
15	M	51	167	34.4	28.0
16	F	53	171	38.3	29.1
17	M	48	170	35.6	29.8
18	M	56	169	33.6	28.0
19	M	40	170	28.0	23.2
20	F	43	165	30.1	25.7
21	F	34	169	30.1	24.9
22	M	30	170	30.8	26.3
23	F	46	168	33.0	28.3
24	M	50	167	37.3	30.5
25	M	43	166	39.9	29.0
26	F	38	168	35.4	28.3
27	F	34	170	27.7	23.2
Mean ± SD		**42.77 ± 6.23**	**168.66 ± 2.09**	**32.1 ± 3.8**	**26.1 ± 2.63**
The p-values derived from Student't'-tests. *P < 0.05 is significant.*					

Twelve weeks after following the ALCAT diet plans, we observed a significant decrease in Body weight, Total Body fat percent and Body Mass Index. Body weight was decreased significantly from 91.37 ± 10.56to 74.6 ± 6.76 kg, Total Body fat % was decreased significantly from 37.1 ± 7.16to 27.66 ± 6.52 % and Body Mass Index was significantly decreased from 32.1 ± 3.8to 26.1 ± 2.63 kg/m2.

DISCUSSION

In this study, we demonstrated the beneficial role of ALCAT test in obesity.
Correlations between obesity and ALCAT test results were positive and significant in these patients. All these patients had difficulty losing weight when they adhered to a reduced calorie diet; this study confirmed a greater weight loss in patients when they were placed on a diet plan according to the ALCAT test results. Also, the weight loss was mostly fat. Other interesting observations included, a better sense of well being and improved physical performance, improvement in abdominal bloating and digestive problems. These findings are significant because many overweight patients find it difficult to lose weight by cutting calories alone. This study suggests that delayed food hyper sensitivities may interfere with weight loss regardless of calorie restrictions. Also the beneficial effects of improved sense of well being and improvement of gastrointestinal conditions were observed collateral benefits consistent with an overall normalization of immune activity.

CONCLUSION

Obesity is a major public health problem among local Arab societies and more recently, among Asian countries as well. The associated health risks and diseases present a tremendous drain on the economy and affect the quality of life. The most effective program's for losing and maintaining a desirable body weight with careful monitoring of proper diet should be implemented holistically to ensure a successful weight reduction program. Individuals need to be aware of the many myths and misconceptions surrounding weight control. Most 'miracle agents' for weight loss do not have a scientific basis. However, these data provide compelling evidence for the effectiveness of the ALCAT test diet plan in producing a positive change in body weight, body Fat and BMI and self reported disease symptoms. Thus our results confirmed the value of ALCAT test and the elimination diet in alleviating symptoms such as obesity, gastrointestinal reflux, chronic fatigue, headache and other chronic disorders associated with food hyper sensitivities.

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