Therapeutic Evaluation of a Unani Formulation (*Safoofe Muhazzil Khaas*) in the Management of *Samane Mufrat* (Obesity)

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Abstract

Samane Mufrat (Obesity) is a worldwide problem and is the most common disorder of nutrition in affluent societies. It is a state of excess adipose tissue mass more than 20% of body weight, becoming leading risk factor for human health. *Samane Mufrat* is described in classical Unani literature in detail with its successful management. The Unani formulation *Safoofe Muhazzil Khaas* advocated in *Kitabul Mansoori* for the purpose is used for this clinical trial. The patients were advised dietary restrictions and brisk walk in both test group and placebo control group. Test drug formulation as well as placebo, both showed statistically significant improvement, with a little better improvement by test drug formulation. This formulation is clinically effective, but requires long term therapy to achieve appreciable improvement in obesity.

Keywords: Samane Mufrat, Obesity, Safoofe Muhazzil Khas

Introduction

Samane Mufrat (Obesity) is a worldwide problem and is the most common disorder of nutrition in affluent societies (Chugh, 2011). It is a state of excess adipose tissue mass (Longo *et al*., 2012; Mohan, 2013; Papadakis and Mcphee, 2009; Gelder *et al*., 2006) characterized by excessive accumulation of fat in the subcutaneous and deep tissue of the body, usually 20% or more of an individual's body weight (Mohan, 2013). *Samane Mufrat* is a complex, multifactorial chronic disorder involving environmental (social and cultural), genetic, physiologic, metabolic, behavioral, and psychological components.

The World Health Organization (WHO) describes global obesity, or "globesity" as one of the top 10 risks factors to human health. The health consequences of obesity range from a number of nonfatal complaints affecting the quality of life, such as respiratory difficulties, musculoskeletal disorders, infertility, and increased risk of high levels of disability, to complaints that lead to an increased risk of premature death including diabetes mellitus type 2, gallbladder disease, cardiovascular problems (hypertension, stroke, and congestive heart disease), and certain cancers (endometrial, breast, and colon). Almost 30-65% of adult urban Indians are reported to be overweight (BMI>=25) or obese (BMI>=30) or have central obesity (Mathur, 2011).

According to classical Unani literature *Samane mufrat* can be general and local as well and is caused by *murattab wa muragghan ghiza* (oily food) (Razi, 1999). In *Samane mufrat hararat-e-ghrizia* diminishes slowly and that is why, obese persons die early than others (Majoosi, 2010) and there is strong co-relation

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between excessive obesity and cardiovascular, cerebrovascular, respiratory and neurological complications (Qamari, 2008; Chandpuri, 1998; and Arzani, YNM). As far as the management is concerned, diet therapy is must along with medicines to reduce weight (Kantoori, 2010 and Jurjani, 2010). *Ibn-e-Sina* focuses on the *taqleel-e-ghiza* (dietary restriction) as the important tool for the purpose, and his treatment was an appetite suppressant made of almonds and beef suet, marsh mallow root, and oil of violets, taken for ten days to abate hunger (Kantoori, 2010) it is also advised that obese persons should avoid taking fatty diets, cooked in oil (Baghdadi, 2005).

Unani physicians recommend the drugs possessing *Muhazzil, Mulattif, Mushil, Mudir and Musakhin* properties in order to reduce weight for the management of *Samane Mufrat.* Single drugs for the purpose are *Luk, Marzanjosh, Tukhme Suddab, Karafs, Juntiyana, Lehsun, Zarawand, Nankhah, Kamoon, Badyan, Sandroos, Filfil siyah, filfil moya, Bisbasa, Aamla, Tukhme Khyarain* etc.

Murakkab Drugs for the purpose are *Safoofe Muhazzil, Safoofe Muhazzil Khaas, Habbe Tinkar, Majoone falafali, Jawarish kamooni, Jawarish bisbasa, Dawa-ul-luk, Anqardiya, Asanasiya, Sikanjabeen,Baladari, Amroosiya, Sanjarniya, Itrifal Sagheer* etc. The compound formulation *Safoofe Muhazzil Khaas* is one of them having most of the single drugs possessing anti-obesity property. Most of the ingredients of Safoofe Muhazzil Khaas are having the following medicinal properties making the formulation a reliable formulation: Mufatteh Sudad, Mulattif, Muqawwi-e-Hararat-Ghrizee, Musakhin, Muqawwi Meda, Mudir Baul, Mushtahi, Kasir Riyah, Qaat-e-akhlat-e-ghliza, Jaali, Muqawwi-e-meda wa Jigar, Mujaffif-e-ratubat-e-badan (Ansari, 1930; Azeez, 1948; Qamri, 2008; Chatterjee, 1995; Anonymous, 2008).

Material and Method

This study was single blind placebo controlled clinical trial conducted in department of Moalejat, Ajmal Khan Tibbiya College hospital during 2012-2014. A Unani compound formulation *Safoofe Muhazzil Khaas* (Table: 1) recommended by *Abu Bakar Mohammad bin Zakaria Razi* was selected as test drug to assess its efficacy in the management of *Samane Mufrat* (Razi, 1999). The test drug formulation was procured from the Dawakhana Tibbiya College, Muslim University, Aligarh. The original formulation is in powder form, but for the purpose of study this powder was transformed into tablets. The test drug was administered in the dose of 5 gm in the morning, whereas wheat flour tablets were given as placebo in the same dose for a period of 2 months. Patients in both groups were also advised exercise (brisk walk for 20-30 minutes according to the condition of the patient) and low calorie diet (1200 – 1800 K. cal /day).

Table 1: Safoofe Muhazzil Khas (Razi, 1991)

S.No.	Name of the drug	Botanical/ Scientific name	Ratio
1.	*Ajwain*	*Trachyspermum ammi* (Linn.) Sprague	1 part
2.	*Suddaab*	*Ruta graveolens* Linn.	1 part
3.	*Zeera*	*Carum carvi* Linn.	1 part
4.	*Marzanjosh*	*Origanum majorana* Linn.	1 part
5.	*Badiyan*	*Foeniculum vulgare* Mill.	1 part
6.	*Krafs*	*Apium graveolens* Mill.	1 part
7.	*Luk maghsool*	*Cocos lacca*	2 part
8.	*Bura Armani*	*Armenian bole*	1/4 part

Initially 48 patients were randomly allocated into test and placebo group. 5 patients in test group and 3 patients in placebo groups were dropped out leaving behind 25 patients in test and 15 patients in placebo group.

a) Inclusion criteria

Patients belonging to 15-60 yrs of age, BMI between 25- 35 kg/m^2, patient able to participate in the study and ready to follow the instructions and to sign the consent form, patients with symptoms complex that consists of any tow of the following clinical features were included in the study:

Restricted movement, joints pain, weakness and lethargy, dyspnoea, and palpitation

b) Exclusion criteria

Patient below the age of 15 and above the age of 60, pregnant and lactating women, patients with severe cardiovascular disease, severe renal disease, severe hepatic disease or any chronic disease, hypothyroidism, BMI > 35 kg/m^2, patients who refused to give the written informed consent for the study were not included in the study.

The selection of patients and the efficacy of the test drug were assessed on the basis of clinical examination and laboratory investigations used for the purpose.

Observations and Results

For the purpose of statistical analysis repeated measure ANOVA was used for intra-group comparison; whereas Kruskal Wallis test was used for inter group comparison as the two groups were of different sample size.

Body weight

The mean body weight in test group at 0 day was 73.8±1.1 (Kg), which reduced to 71.2±1.1 (Kg) at the end of trial, on statistical analysis the value of $p<0.001$, hence the result was significant. In placebo group mean body weight was reduced from 72.6±1.4 (Kg) to 70.5±1.3 (Kg), the result was found statistically significant ($p<0.001$) (Table 2)

For inter group comparison $p>0.05$, hence difference between two groups was not significant.

BMI

The mean BMI in test group at 0 day was 30.1±0.4 (kg/m^2), which reduced to 29.1±0.4 (kg/m^2) at the end of trial, on statistical analysis the value of $p<0.001$, hence the result was significant. In placebo group mean BMI was reduced from 29.6±0.4 to 28.7±0.3 (kg/m^2), the result was found statistically significant ($p<0.001$) (Table 2).

For inter group comparison $p>0.05$, hence difference between two groups was not significant.

Waist Circumference

The mean Waist circumference in test group at 0 day was 93.6±1.2 (cm), which reduced to 92.6±1.2 (cm) at the end of trial, on statistical analysis the value of $p<0.001$, hence the result was significant. In placebo group mean waist circumference was reduced from 93.4±1.4 (cm) to 92.6±1.5 (cm), the result was found statistically significant ($p<0.001$) (Table 2).

For inter group comparison $p>0.05$, hence difference between two groups was not significant.

Lipid Profile

Serum Cholesterol

The mean serum cholesterol in test group at 0 day was 202.2±8.5 (mg/dl), which reduced to 189.8±8.1 (mg/dl) at the end of trial, on statistical analysis the value of $p<0.001$, hence the result was significant. In placebo group mean serum cholesterol was reduced from 201.5±9.4 to 193.8±9.7 (mg/dl), the result was found statistically significant ($p<0.001$) (Table 3).

For inter group comparison $p>0.05$, hence difference between two groups was not significant.

Table 2: Effect of test drug vs. placebo on different parameters of obesity (Mean±SEM)

Group	Body weight (Kg)		Body Mass Index (Kg/m^2)		Waist Circumference (cm)	
	0 day	60th day	0 day	60th day	0 day	60th day
Test n=25	73.8±1.1	71.2±1.1	30.1±0.4	29.1±0.4	93.6±1.2	92.6±1.2
	P<0.001		P<0.001		P<0.001	
Placebo n=15	72.6±1.4	70.5±1.3	29.6±0.4	28.7±0.3	93.4±1.4	92.6±1.5
	P<0.001		P<0.001		P<0.001	

On applying Kurskal wallis test between test and placebo for body weight p>0.05, BMI p>0.05 and Waist circumference p>0.05

Table 3: Effect of test drug vs. placebo on Lipid Profile (Mean±SEM)

Group	Serum Cholesterol (mg/dl)		Serum Triglyceride (mg/dl)		HDL (mg/dl)	
	0 day	60th day	0 day	60th day	0 day	60th day
Test n=25	202.2±8.5	189.8±8.1	189.5±12	171.5±12	37.2±1.3	45±1.4
	P<0.001		P<0.001		P<0.001	
Placebo n=15	201.5±9.4	193.8±9.7	155.2±8	144.1±9	39.4±1.5	45.4±1.5
	P<0.001		P<0.001		P<0.001	

On applying Kurskal wallis test between test and placebo for Serum cholesterol p>0.05, Serum triglyceride p>0.05 and HDL p>0.05

Triglyceride

The mean serum cholesterol in test group at 0 day was 189.5±12 (mg/dl), which reduced to 171.5±12 (mg/dl) at the end of trial, on statistical analysis the value of p<0.001, hence the result was significant. In placebo group mean serum cholesterol was reduced from 155.2±8 to 144.1±9 (mg/dl), the result was found statistically significant (p<0.001) (Table 3).

For inter group comparison p>0.05, hence difference between two groups was not significant.

HDL

The mean HDL in test group at 0 day was 37.2±1.3 (mg/dl), which increased to 45±1.4 (mg/dl) at the end of trial, on statistical analysis the value of p<0.001,

hence the result was significant. In placebo group mean HDL was increased from 39.4±1.5 to 45.4±1.5 (mg/dl), the result was found statistically significant ($p<0.001$) (Table 3).

For inter group comparison $p>0.05$, hence difference between two groups was not significant.

Discussion and Conclusion

In this study the management of obesity is based on tripartite approach of treatment *(Ilaj bil Ghiza, Ilaj bit Tadbeer* and *Ilaj bil Dawa)*. Obesity is a chronic disorder and develops due to deposition of excessive fat and accumulation of morbid matter (*Ghalbae Akhlat-e-galeeza*). The dietary restriction and physical exertion is the mainstay in the management of obesity apart from the medicines. In one hand dietary restriction and physical exertion increases the consumption of body fat to provide energy and thereby helpful in reducing body weight and on other hand the Unani drugs used in the management help to evacuate the morbid matter particularly *Akhlat-e-ghaleeza* from the body.

Table 4: Safety Assessment comparison for both groups (Baseline vs. 60th day)

Parameters		Test group (n=25)		Placebo group (n=15)	
		0 day	60th day	0 day	60th day
		Mean±SEM	Mean±SEM	Mean±SEM	Mean±SEM
Hb%		11±0.2	11±0.2	11.78±0.3	11.7±0.3
TLC		8164±390	8028±400	7073±503	7300±450
DLC	P	50±1.8	45±2	39±2	39±2
	L	37±1.5	30±1.6	35±1.5	35±1.5
	E	3±0.2	2.5±0.3	2.8±0.4	2.8±0.4
	M	2.1±0.1	2.6±0.2	1.4±0.4	1.4±0.4
	B	0	0	0.1±0.9	0.1±0.9
ESR		30±2	28±1.9	27±3	26±2
S. Bilirubin		0.7±0.05	0.5±0.04	0.7±0.04	0.7±0.05
AST		32±2	28±2	31±2	29±2
ALT		32±1.5	31±1.5	32±1	48±2
Alk. Phos.		128±3	126±2.3	134±3	125±3
S. Creatinine		0.83±0.03	0.7±0.04	0.8±0.03	0.6±0.03
Blood Urea		28±1.4	28±1.5	32.1±1	28±2
B. Sugar (R)		116.25±3	108.68±3	128±4	123±4

Repeated measure ANOVA test is applied between 0 day and 60th day in both groups and for both groups the value of $p>0.05$, hence not significant

When data obtained were statistically analyzed for assessment of the efficacy of test drug formulation and placebo by using repeated measure ANOVA test for intra-group comparison it was found that the result was significant for all the parameters in both groups. On inter-group comparison by Kruskal Wallis test it was found statistically insignificant ($p>0.05$); meaning therefore the test drug formulation and placebo both have almost equal efficacy on reducing obesity, however the test drug formulation exhibited a little better result.

Significant effect on reducing body weight in placebo group may be due to strict dietary restriction and moderate exercise which was advised in both groups. Further, in test group a little better improvement may be attributed to the *Muhazzil* effect of *Luk maghsool* (Kantoori, 2010; Baitar, 2003; Hakeem, 2002; Naseer, YNM; Ghani, YNM), *Mulattif* action of *Marzanjosh* (Baghdadi, 2005; Ghani, YNM), *Hazim wa Mulattif* effect of *Ajwain, Zeera* and *Badiyan* (Ghani, YNM; Baitar, 2003), *Ajwain, Zeera, Karafs* and *Marzanjosh* also have *Musakhin* effect thus increase BMR, and *Qate akhlate ghaliza* properties of *Bora Armani* (Kantoori, 2010; Baitar, 2003; Hakeem, 2002; Kabeeruddin, YNM and Naseer, YNM). The above mentioned diverse pharmacological action of drug component of the formulation might complement or synergise each other and facilitate the anti obesity effect.

The significant improvement in BMI and Waist circumference is directly associated with reduction of body weight. The reduction in body weight in obese persons is mainly due to burning of the accumulated fat. Therefore, the reduction in waist circumference may be attributed to the dissolution of body fat and more precisely abdominal fat due to above mentioned medicinal properties of the Unani formulation and strict diet restriction with physical exertion as advised.

Lipid Profile

There were statistically significant reduction in the levels of Serum cholesterol and Serum triglyceride in both test group as well as in placebo group ($p<0.001$). For inter group comparison it was found insignificant ($p>0.05$). However, a little better result was seen in test group, this result may be due to lipid lowering effect of the main ingredient of test formulation *Luk maghsool* which possess *muhazzil* (weight reducing) property that is probably achieved by increased utilization of fat for energy production (Kantoori, 2010; Baitar, 2003 and Ghani, YNM), moreover increased physical exertion is associated with increased energy consumption that might be provided by burning of body fat.

According to the concept of Unani system of medicine fat is concerned as *Akhlate-e-ghaleeza,* and one of the drug components *Bora armani* is *Qate akhlat-e-ghaleeza*, hence this medicinal effect might reduced the serum cholesterol and

triglyceride (Kantoori, 2010; Baitar, 2003; Hakeem, 2002; Kabeeruddin, YNM and Naseer, YNM).

As far as the HDL is concerned, it is a good lipid and its quantity was increased in appreciable quantity, this achievement may be attributed to the physical exertion in the form of brisk walk as advised in both groups.

Body weight, BMI and WC are standard objective parameters for the assessment of efficacy of test drug and placebo in the patients of obesity. The overall improvement in obesity may be due to reduction in Body weight, BMI and WC as discussed above.

Several studies support our contention that dietary modification reduces energy intake and increased physical activity requires greater energy, ultimately required energy is provided by burning of accumulated fat and thereby reduces body weight, on other hand the Unani drugs used for the purpose evacuate the morbid matter particularly *Akhlate ghaliza* from the body. Though all the subjective and objective parameters along with laboratory findings did not come to the normal limits but the improvement is towards normalcy as the duration of therapeutics is shorter (2 months). If the same treatment be continued for a longer period, say 6 months, the results might be better, appreciable and in the normal range.

In this study safety parameters (Haemogram, TLC, DLC, ESR, LFT, and RFT etc.) were also taken into account to rule out any adverse effect (Table: 4) and after statistical analysis the drug formulation was declared as safe. During entire period of the study, no adverse effect was reported by patients.

In the light of above discussion it can be concluded that test drug formulation *Safoofe Muhazzil Khaas* produced a little better anti obesity effect without any side/ adverse effect as compared with the placebo, and it is further proposed to study the same formulation for a longer period to get better results to declare it as anti-obesity formulation.

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