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Role of Lifestyle Modification and Allopathic Management of Polycystic Ovarian Syndrome

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Abstract

Polycystic ovarian syndrome (PCOS) is a complex endocrine disorder influencing women of childbearing age. It is associated with anovulation, menstrual irregularities, infertility and insulin resistance. The study was conducted among 269 women and all were screened using questionnaires for demographic profile, anthropometric measurements and clinical examination as well as diagnosed as PCOS based on Rotterdam Criteria. The purposive sampling technique was used and 113 subjects were enrolled for interventional strategies. 37 women were managed with Life style modifications in the form of diet and exercise and 44 women were managed with allopathic treatment. Descriptive statistics, Paired T' test, ANOVA, Bonferroni and Chi square test were pre owned for objective analysis. Among the groups, the LSM group showed reduction in BMI (10.7% reduction). Acne reduced to 51.35%. Hyperandrogenism reduced to 27.03%.There was statistically momentous contrast between allopathic and Lifestyle modification Group at P <0.05 in the pre-test and post test mean values. It revealed that in allopathic group, BMI slightly increased but not significant. But, Menstrual regulation was achieved with both modalities of treatments. BMI, WHR, Hyperandrogenic symptoms such as Alopecia, Acne and Hirsutism significantly reduced in lifestyle modification groups as compared to allopathy only group. In general, the LSM group proved to have significant reduction in the PCOS signs and symptoms.

Keywords: PCOS,Oligomenorrhea, Lifestyle Modification, Allopathic and Hyperandrogenism.

Introduction

Polycystic ovarian syndrome (PCOS) is a common disorder that affects women of reproductive age, with a variety of clinical features. Oligo-anovulation (reduced ovulation), irregular menstrual cycles, biochemical hyperandrogenism (high circulating male hormones or androgens such as testosterone), clinical hyperandrogenism (effects of androgens on body tissues, including hirsutism or excess hair growth) and infertility comprise these reproductive characteristics. (Teede 2018). The aetiology of PCOS is unknown although abnormalities in steroidogenesis (the production of steroid hormones such as reproductive hormones) and gonadotropin action (the action of hormones that control reproductive hormone production) are implicated. Insulin resistance and compensatory hyperinsulinaemia are proposed as significant aetiological factors and are present in 75% and 95% of lean and overweight women with PCOS respectively (Behbourdi-Gandevani 2016). In people with PCOS, obesity is very common and studies have shown that about 50 percent of women affected are overweight or obese, which has a detrimental effect in the pathophysiology of PCOS, contributing to increased levels of androgen and chronic anovulation. PCOS obesity can lead to developmental, gestational, metabolic and psychological risks, and so effective strategies to better control PCOS obesity are imperative. Gestational Diabetes Prevalence, Glucose tolerance deficiency and type 2 diabetes (5-fold in Asia,4-fold in the Americas and 3-fold in Europe) was substantially increased in PCOS irrespective of their age, with a risk that is independent of obesity but amplified. To reduce the economic burden and improve health outcomes for women with PCOS, successful therapies are required. Present PCOS therapeutic treatments mostly concentrate on sexual failure and insulin resistance, such as oral contraceptive pills (OCP) and metformin. However, due to possible adverse metabolic and cardiovascular consequences, long-term use of these drugs is controversial. Lifestyle alteration along with the use of medicinal plants is the most favoured and efficient method of PCOS treatment.There are not many studies to grade the accouterments of lifestyle alteration and herbal therapy over PCOS. This study will reveal the iceberg population of PCOS women by conducting a survey among selected women. Despite available treatments for PCOS, in that respect no ideal pharmacological intervention is seen. Hence, it is essential to compare the effective

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intervention for PCOS. The study assumes significance in Indian context.

Objectives

Assess the effectiveness of interventional strategies on polycystic ovarian syndrome among selected reproductive age women in Coimbatore

Method

According to the Rotterdam Criteria in order to develop a diagnosis, two of the following conditions must be fulfilled: (i) oligo-and/or anovulation; (ii) clinical and/or biochemical symptoms of hyperandrogenism; and (iii) ultrasound-visualized polycystic ovaries. Furthermore, it is crucial to waive other hidden causes of symptoms, such as congenital adrenal hyperplasia, androgen-secreting tumours, hyperprolactinemia, thyroid disorders and Cushing 's syndrome. (Rotterdam,2003). The study was performed after receiving approval from the Human Ethical Committee of the Institution. The study commenced by conducting a survey among 269 reproductive aged women of 18-35 years. All of them screened with questionnaires on demographic profile, anthropometric measurements, and clinical examination as well as diagnosed for PCOS with Rotterdam Criteria. Using purposive sampling technique, the subjects were chosen. The investigator chose the samples based on the parameters of inclusion and exclusion suggested.

Inclusion Criteria

- Women having irregular menstruation and fulfilling Rotterdam Criteria
- Both married and unmarried women
- Willing to participate in the study

Exclusion Criteria

- Women who are younger than 18 years and older than 35 years.
- Women who could comply the intervention more than 3 days in a week
- History of pelvic diseases, previous pelvic surgery, hormonal replacement therapy and other endocrine diseases.

Interventional strategies for 113 subjects were enrolled. selected 44 subjects received allopathic treatment for PCOS in a private PCOS hospital, Coimbatore and 37 were managed with Lifestyle modification in the form of diet and exercise. The subjects were followed throughout the intervention and weekly educational sessions were conducted. Prior to the intervention, pre test was done and after the interventions, subjects underwent post test in the third month and sixth month.

Allopathic treatment

Allopathic treatment involves symptomatic management in the form of cycle regulation, management of hyperandrogenism, glycemic control.

- Combination birth control pills. Pills that contain estrogen and progestin reduce androgen production and regulate estrogen. Regulating hormones can lower risk of endometrial cancer and correct abnormal bleeding, excess hair growth and acne.
- Metformin**.** This oral medication for type 2 diabetes improves insulin sensitivity.
- Myo inositol: It creates a healthy intra-ovarian milieu, which will correct hyperandrogenism, improve menstrual regularity, and promote ovulation and fertility.

Lifestyle modifications of Diet and exercises

Lifestyle management approach consisting of dietary and exercises, helpful in achieving weight loss.

Dietary Management

The most beneficial dietary macronutrient composition with other dietary approaches, including depressed glycemic index, high protein like beans and lentils and fish, eggs, red meat and poultry, low carbohydrate, high monounsaturated fatty acids (MUFA) diet or adjusted fatty acid diets to boost insulin resistance and subjects were motivated to consume more vegetables and fruits.

Exercises

The exercises training were adopted by the subjects 6 days a week and 40 minutes a day which includes warm up, stretching, breathing and other exercises and continuous motivation was provided. To reflect the basic distribution of different parameters, descriptive statistics (mean and standard deviation) were used. To find out the importance of the effect of interventions on different parameters, ANOVA was performed in two ways. In order to assess the significance of the effect of interventions using pre and post intervention values, Paired T' test was used.

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RESULTS

Table 1. *Distribution of the subjects prior to the interventions*

Description	Allopathy	LSM
HAIR GROWTH		
>8	35	15
<7	9	22
ACNE PRESENT		
YES	20	14
NO	16	16
MayBE	8	7
AGE OF MENARCHY		
<11	5	5
12 to 14	30	25
>15	9	7
Menstrual Duration		
<21	1	7
21-45	21	21
45-60	16	6
60-90	3	1
>90	3	2
ALOPECIA		
NO	12	10
Mild	23	23
Moderate	8	3
Excessive	1	1
BMI		
<25	13	13
>25	28	24
25	3	
AGE		
18-21	3	17
22-26	12	6
27-30	18	5
31-32	5	1

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33-35	3	8
WHR		
>0.85	40	11
<=0.85	4	26

Table 2. *Percent Reduction of PCOS signs in allopathic and LSM groups*

Parameters	Allopathy			LSM		
	Pre Test	Post Test- 3 Months	Post Test – 6 Months	Pre Test	Post Test- 3Months	st Test - 6 Months
BMI (Mean)	27.27	27.13	27	24.3	23	21.7
WHR (Mean)	0.82	0.82	0.82	0.84	0.84	0.81
Alopecia (Number of persons)						
No	12	13	13	10	13	13
Mild	23	22	22	23	18	20
Moderate	8	8	8	3	6	4
Excessive	1	1	1	1	0	0
Acne (Number of persons)						
Yes	20	11	10	14	0	0
No	16	26	28	16	33	35
May be	8	7	6	7	4	2
Menstrual Duration (Number of persons)						
<21	1	0	0	7	0	0
21-45	21	40	42	21	34	36
45-60	16	4	2	6	4	2
60-90	3	0	0	1	0	0
>90	3	0	0	2	0	0
Hair Growth (Number of persons)						
>8	35	30	30	15	5	5
<7	9	14	14	22	32	32

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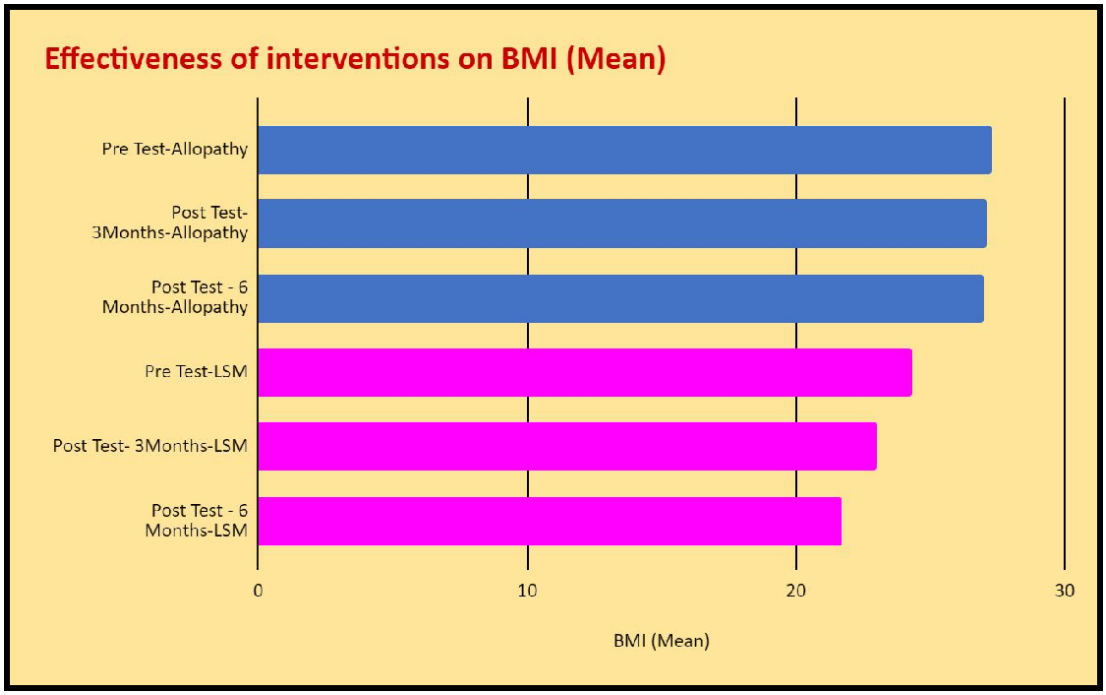

Figure 1. Comparison between impact of Intervention on BMI

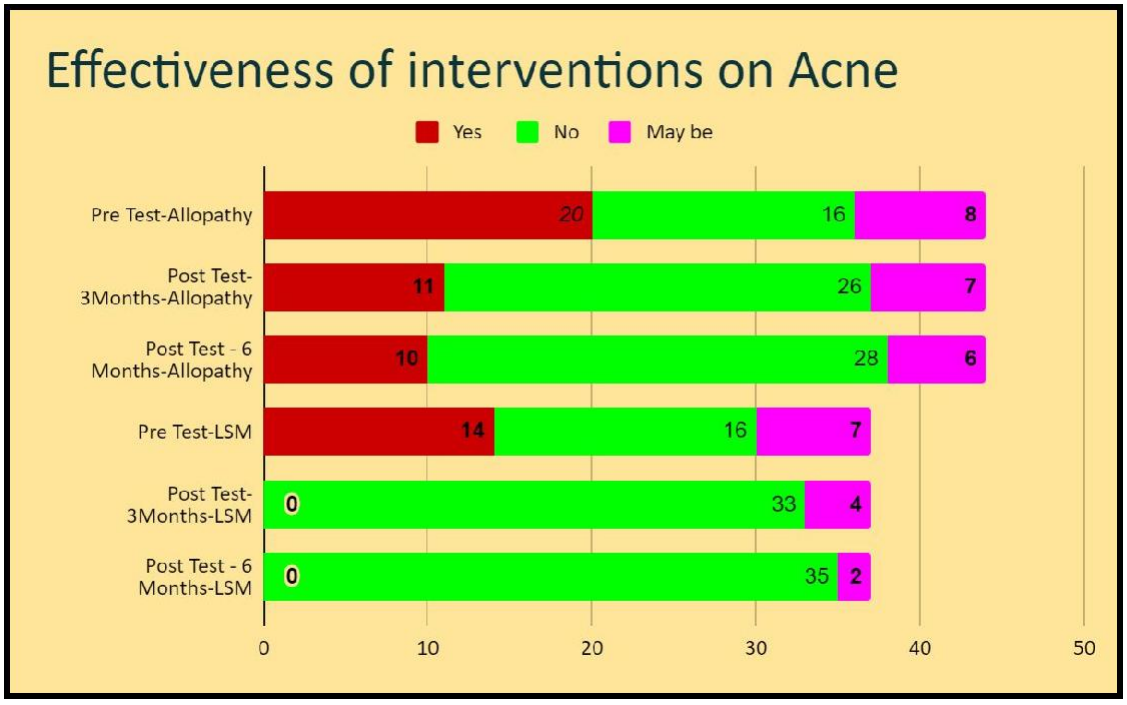

Figure II. Comparison between impact of Intervention on Acne

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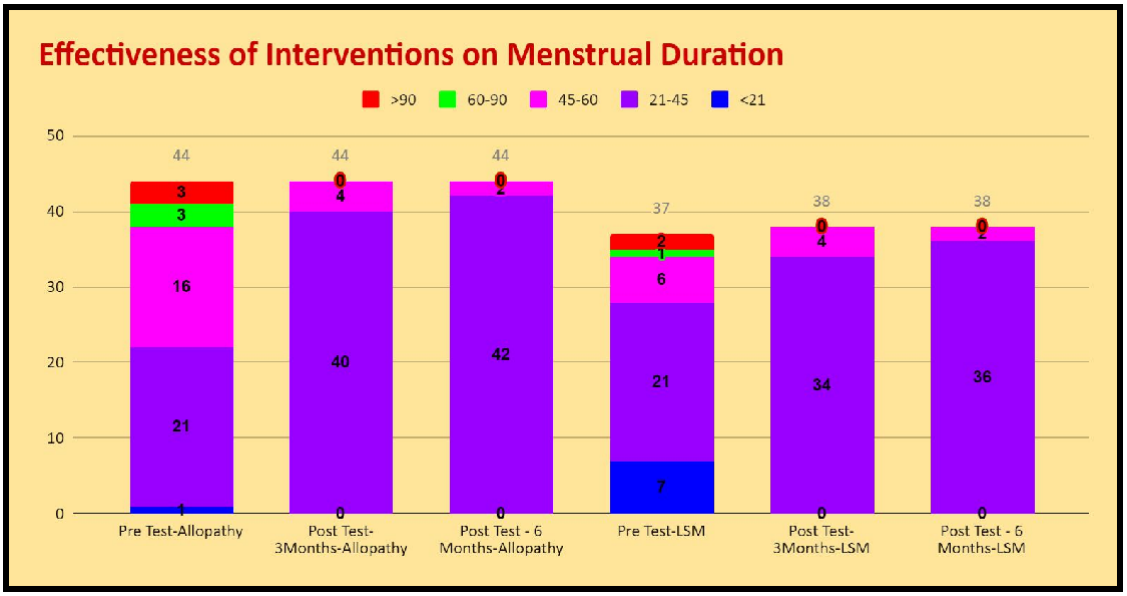

Figure III. Comparison between impact of Intervention on Menstrual duration

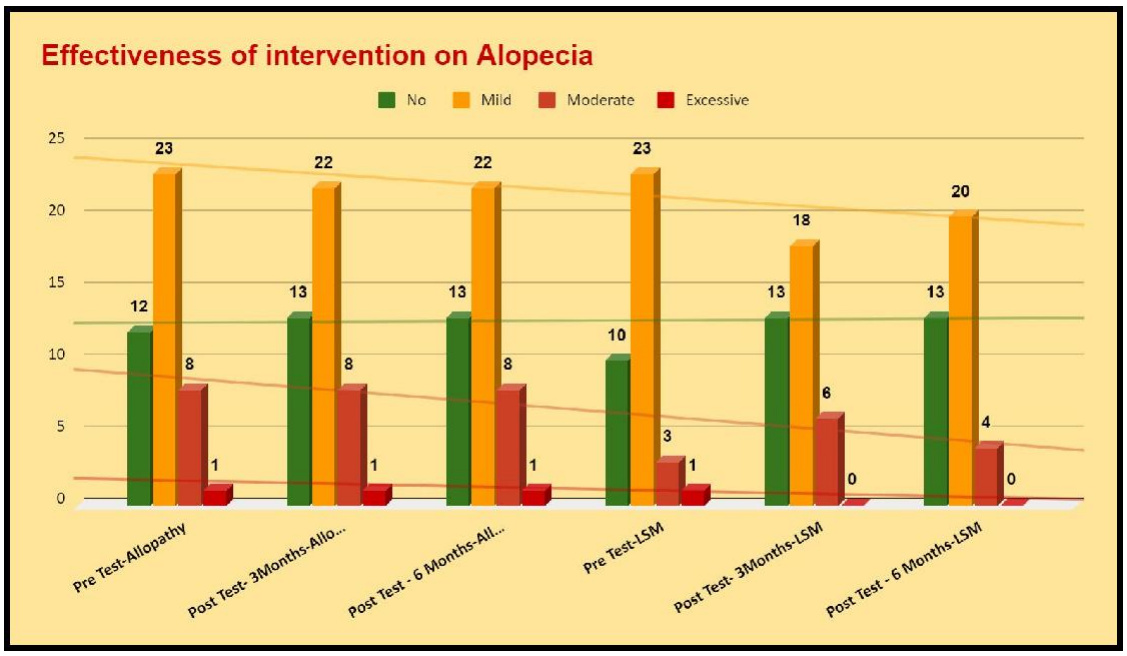

Figure IV. Comparison between impact of Intervention on Alopecia

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Table 3. *Mean Differences in allopathic group*

	Paired Differences					t	df	Sig. (2-tail ed)	S/NS
and Post Values	**Mean**	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**					
				Lower	Upper				
BMI	-0.02273	1.37229	0.20688	-0.43994	0.39449	-0.11	43	0.913	NS
Waist Circumference	0.8023	1.1304	0.1704	0.4586	1.146	4.708	43	0	S
Hip Circumference	0.9841	1.385	0.2088	0.563	1.4052	4.713	43	0	s
Hair growth	0.091	0.291	0.044	0.002	0.179	2.074	43	0.044	S
Menstrual Cycle	14.364	6.474	0.976	12.395	16.332	14.717	43	0	S

Significant at 0.05 level

Table 4. *Mean Differences in LSM group*

Paired Samples Test									
and Post Values	Paired Differences					t	df	Sig. (2-tail ed)	S/NS
	Mean	Std. Deviatio n	d. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Weight	6.3135	1.8651	0.3066	5.6917	6.9354	20.591	36	0	S
BMI	2.5514	0.6826	0.1122	2.3238	2.7789	22.737	36	0	S
waist	6.4351	8.625	1.4179	3.5594	9.3109	4.538	36	0	S
Hip	5.176	9.989	1.642	1.845	8.506	3.152	36	0.003	S
Waist-to-hip ratio	0.02054	0.05563	0.00914	0.00199	0.03909	2.246	36	0.031	S
Hair growth	1.189	1.076	0.177	0.83	1.548	6.723	36	0	S
Menstrual Cycle	13.973	18.082	2.973	7.944	20.002	4.7	36	0	S

S-Significant. NS-Non Significant

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Table 5. *Anova Differences Between LSM and Allopathic group*

		N	Mean	Std. Deviation	Std. Error	F	Sig.	S/NS
weight difference	Allopathy	44	.5682	.92253	.13908	324.659	0.000	S
	LSM	37	6.3243	1.86673	0.30689			
	Total	81	3.1975	3.2171	0.35746			
BMI difference	Allopathy	44	-0.0227	1.30845	0.19726	0.011	0.916	NS
	LSM	37	0	0	0			
	Total	81	-0.0123	0.95935	0.10659			
waist difference	Allopathy	44	0.8068	1.13637	0.17131	18.42	0.000	S
	LSM	37	6.4405	8.62878	1.41856			
	Total	81	3.3802	6.49408	0.72156			
hip difference	Allopathy	44	0.9841	1.38496	0.20879	1.088	0.300	S
	LSM	37	-0.6216	10.10872	1.66186			
	Total	81	0.2506	6.90381	0.76709			
hirsutism difference	Allopathy	44	0.0909	0.2908	0.04384	42.268	0.00	S
	LSM	37	1.1892	1.07595	0.17688			
	Total	81	0.5926	0.93244	0.1036			
mens cycle difference	Allopathy	44	14.3636	6.47389	0.97598	0.018	0.894	NS
	LSM	37	13.973	18.08235	2.97272			
	Total	81	14.1852	13.027	1.44744			

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The impact of allopathic and Lifestyle modification are presented. Table/Figure-1 displays the mean pretest values of the test variables. There was a statistically significant difference between allopathic and Lifestyle modification Group at $P < 0.05$ in the pre-test and post test mean values. Table /Figure-2 displays the mean pre and post test values of the test variables. In the post test mean values, there was a statistically highly significant difference between both groups at $P< 0.005$. Within the group study, as shown in Table/Figure-3 and Table/Figure-4, both groups displayed statistically highly significant differences in Allopathic and LSM groups. The statistical analysis showed that both groups had substantial increase in post-test mean values, but LSM was more successful than allopathic when the groups were compared.

Discussion

Previous studies have demonstrated substantial improvements in body weight and IR with equivalent exercise intervention. (PalombaS, et al,2008) In a study, Vigorito et al,2007. found that, relative to a non-aerobic exercise PCOS group, a three-month structured aerobic exercise programme decreased BMI in overweight women with PCOS. Compared with dieting or exercise alone, the combination of exercise and dieting has been widely reported to dramatically improve weight loss. This research further supports the fact that exercise training enhances body metabolism and a range of risk markers for CVD regardless of weight loss in individuals who are overweight and obese.For high-risk (pre-diabetic) patients, Lifestyle Modification (LSM) programmes consisting of diet with or without regular exercise are advised to postpone the development of adult type 2 diabetes (GilliesCL,et al.2017), one of the most severe complications of PCOS. Lifestyle behaviour studies have shown that increased physical activity and reduced caloric intake significantly enhance ovulatory function, circulating androgen levels, inflammatory pattern and insulin sensitivity in women with PCOS.(Ferreira RC,2010). Lifestyle management that incorporate energy restriction for weight loss and daily exercise will also tend to be a favoured treatment option for women with PCOS who are overweight. This research highlights the fact that exercise intervention with dietary modification has proved to minimize the clinical, menstrual and anthropometric symptoms of PCOS.

Limitations of the Study

The limited sample size, the inclusion criteria were not based on the subjects' BMI, biochemical parameters could not be studied.

Conclusion

The present study concluded that in subjects with PCOS, six months of life-style modifications improved the PCOS variables as compared to allopathic groups. Therefore, lifestyle modification was superior to allopathic treatment on anthropometric and insulin resistance symptoms, on hormonal profiles and enhancing quality of life. Long term studies are recommended to prove the efficacy of a sustainable strategy.

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