



Case Report

Integrated Yoga and Naturopathy module in management of Metabolic Syndrome: A case report



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ABSTRACT

A 50-year-old male participant with sedentary lifestyle, diagnosed with Metabolic Syndrome (MetS) [obesity, Type-2 diabetes mellitus, hypertension] and hypothyroidism since 2013, was administered integrated Yoga and Naturopathy (IYN) for 6 weeks as a tailor made individualized protocol at the residential integrative medical facility in Bangalore between October and November 2015. The results showed reduction in weight (97.9 kg to 74.6 kg), Body Mass Index (BMI) (35.1 kg/m^2 to 27.86 kg/m^2), total cholesterol (192 mg% to 145 mg%), triglycerides (153 mg% to 90 mg%), Low Density Lipoprotein (LDL) (124 mg% to 81 mg%), High Density Lipoprotein (HDL) (40 mg% to 46 mg%), fasting blood glucose (110 mg/dl to 75 mg/dl), postprandial glucose (267 mg/dl to 100 mg/dl), glycated hemoglobin (HbA1c) (7.8%–7.1%), Thyroid Stimulating Hormone (TSH) (6.90 $\mu\text{IU/ml}$ to 3.052 $\mu\text{IU/ml}$). Following the intervention, the anti-hypertensive, oral hypoglycemic, thyroid raising and analgesic medicines were not required to be continued. His knee pain minimized on discharge as observed on a Visual Analog Scale. He had an improved feeling of wellness and overall functional health. All his parameters were within normal range at the 12-weeks follow-up, as he had incorporated the lifestyle program into his daily routine. This case report suggests that lifestyle change by integration of specific non-drug Yoga and Naturopathic intervention is useful in the management of MetS.

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1. Introduction

Metabolic syndrome (MetS) is a common disorder associated with obesity [1]. The National Cholesterol Education Program (NCEP) defines MetS as ‘those subjects with 3 or more of the following 5 cardiovascular risk factors: 1) central obesity (waist circumference: men >102 cm; women >88 cm); 2) elevated triglycerides ($\geq 150 \text{ mg/dl}$); 3) diminished high-density lipoprotein (HDL) cholesterol (men <40 mg/dl; women <50 mg/dl); 4) systemic hypertension ($\geq 130/\geq 85 \text{ mm Hg}$); and 5) elevated fasting glucose ($\geq 110 \text{ mg/dl}$) [2]. The revised NCEP definition includes patients being treated for dyslipidemia, hyperglycemia, or systemic hypertension. MetS affects about a third of the population in urban areas

in South Asia [3]. In such cases, early detection, intervention, and secondary prevention are essential.

Non-pharmacological lifestyle interventions are recommended for management of MetS. There are published reports of the significant effect of individual components of naturopathy like calorie restriction and therapeutic fasting on the health status of MetS [4,5]. Yoga, being a potent non-pharmacological lifestyle intervention, has been reported to be a successful complementary treatment for MetS. In yogic terminology, MetS, is considered as *Adhija-Vyadhi*, being of known psychosomatic origin. According to an ancient yogic text, *Yoga Vasistha*, *Adhija-Vyadhi* are the diseases that originate in the mind (*Adhi*) and gain access through the vital energy to the physical body and settles in as a physical disease (*Vyadhi*) [6]. Yogic practices have shown to improve the insulin sensitivity [7] in diabetics and reduction in weight [8] and blood pressure [9] in cases of MetS. We report this case as a safe and effective possibility of integrating yoga and naturopathy in the management of MetS since there are no studies reporting such effects.

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2. Presenting concerns

Mr. SAG, a 50-year-old male participant with sedentary lifestyle, was admitted to the residential health home at Bangalore, on October 3, 2015. He had generalized weakness, fatigability, increased body weight, bilateral knee pain since 4 years. He also had hypertension since 1 year, diabetes mellitus and hypothyroidism since 3 years, with family history being negative for MetS.

3. Clinical findings

His body weight was found to be 97.9 kg, height 167 cms with a BMI of 35.1 kg/m². His pulse rate was 78 beats/minute and blood pressure 142/90 mmHg. Before admission, he was taking oral hypoglycemic medication (combination of glimepiride and metformin, BD, Voglibose 0.03 mg BD for 3 years), levothyroxine sodium 100 µg, OD (3 yrs), tab. Telmisartan 20 mg OD and tab. Aceclofenac, BD.

4. Diagnostic focus and assessments

Height was recorded on a stadiometer. Weight was recorded every week using an electronic research grade weighing scale. Resting blood pressure was measured during daily doctor's visit

using a standard mercury sphygmomanometer keeping the time of the day same. Pulse rate, respiratory rate and breath holding time were also recorded during the physician rounds. Visual Analog Scale (VAS) for knee pain was noted on a weekly basis. Blood glucose levels were monitored using a glucometer to avoid episodes of hypoglycemia as the participant was on restricted 800 calorie diet. The lipid profile, thyroid profile, and glucose profile were checked at baseline and post-intervention in the same laboratory. All the parameters of baseline, 6 weeks and follow-up are described in Table 2.

In Yogic understanding, MetS is classified as *Adhija Vyadhi* (stress borne illness), whereas Naturopathy adapts an approach of unity of disease, wherein all diseases are result of accumulation of toxins in the system, as a result of following non-natural lifestyle.

5. Methods

Following a detailed case history, initial counseling and obtaining signed informed consent, the intervention was planned by a team of consultants that included a physician, a naturopathy and yoga expert. Keeping a daily watch on the vital and blood parameters, the medications were tapered by the physician. His inpatient stay at the facility was for 6 weeks.

Table 1
Integrated Yoga Naturopathy (IYN) protocol.

Integrative yoga protocol for everyday		
Name of the practices	Details	Duration
Loosening practices	Joint loosening practices for hand, leg, neck and trunk	5 min
<i>Suryanamaskara</i>	12 counts	5 min
Breathing practices	Hand in & out breathing, Hand stretch breathing, Straight leg raising with breathing, <i>salabhāsna</i> Breathing	10 min
<i>Asana</i> practices	<i>Ardha chakrasana, Ardhakati Chakrasana, Padahastana, Ardha Machendrasana, Vakrasana, Navasana, Parivrtta Trikonasana</i>	15 min
<i>Pranayama</i>	<i>Kapalabhati, Surya anuloma, Vibhagiya pranayama</i>	5 min
Relaxation	Deep Relaxation Technique (DRT)	5 min
Integrated naturopathy treatment	protocol for a week	
Days	9–10 am	2–3 pm
Monday	Neutral spinal spray	cold hip bath and GH Pack
Tuesday	Neutral underwater massage	General oil application and steam bath with chest compress
Wednesday	Full body massage	cold hip bath and GH Pack
Thursday	Neutral immersion bath	Cold throat pack and Mustered pack to knee
Friday	Cold Circular Jet	Oil application to knee and IRR
Saturday	Partial massage to hip and legs	Full mud bath
Sunday	Vibro massage	No treatment

GH pack—Gastro-Hepatic Pack, IRR—Infrared rays.

One-week Treatment protocol was repeated every week.

Note: The Naturopathy therapies were repeated on a weekly basis.

Table 2
Patient's status on admission, discharge and follow-up.

Variables		Date of Admission (Baseline)	Date of discharge (6 weeks)	14-week follow-up	18-week follow-up
General parameters	Weight (kg)	97.9	77.6	76.5	74.3
	BMI (kg/m ²)	35.1	27.8	27.2	26.6
Blood pressure	Systolic (mmHg)	142	120	122	118
	Diastolic (mmHg)	90	74	74	72
Lipid profile	Total Cholesterol (mg%)	192	145	152	163
	Serum Triglycerides (mg%)	153	90	92	85
	HDL (mg%)	40	46	48	46
	LDL (mg%)	124	81	92	106
Thyroid profile	TSH (µIU/ml)	6.90	3.052		5.20
Blood glucose	FBS (mg%)	110	75	86	84
	PPBS (mg%)	267	100	124	134
	HbA1c (%)	7.8	7.1	6.6	5.8
VAS for pain	VAS for knee pain	6	1	1	1
	VAS for neck pain	5	1	1	0

kg – Kilograms, kg/m² – Kilogram/meter², mmHg – millimeters of mercury, mg% - milligrams/100 ml of blood, µIU/ml – micro International Units/milliliters.

6. Therapeutic focus and assessment

After a thorough evaluation, the IYN protocol was planned. The naturopathic therapies included a combination of therapeutic fasting and calorie restricted diet, hydrotherapy, mud therapy and manipulative therapies, with a focus on the detoxification. The therapies administered were modified based on the patient's response assessed in the daily visit of the physician. Considering the involvement of the mind–body complex in the pathogenesis of the MetS, an integrated yoga program was designed including *asanas*, *pranayama*, meditation, relaxation techniques, *kriyas*, educative lectures and yoga based counseling sessions. Table 1 shows the IYN protocol and daily routine.

7. Follow-up

After the 6-week inpatient protocol, the patient was advised to follow a calorie restricted vegetarian diet (1200 Kcal/day) and yoga program as prescribed at the time of discharge. He was also advised to practice juice fasting once a week. He visited our center for follow-up at the end of 8th (14th week from admission) and 12th (18th week from admission) weeks following discharge, during which the all the parameters were re-assessed. The course of the reporting of the case is presented in Fig. 1

8. Outcomes

The results showed reduction in weight (97.9 kgs–74.6 kgs), total cholesterol (192 mg% to 145 mg%), triglycerides (153 mg% to 90 mg%), fasting blood glucose (110 mg% to 75 mg%), postprandial glucose (264 mg% to 100 mg%), HbA1c (7.8%–7.1%), TSH (6.90 μ IU/ml to 3.052 μ IU/ml) along with reduction of medication. At the end of the intervention period of 6 weeks, the allopathic anti-hypertensive, oral hypoglycemic, thyroid raising and analgesic medicines were not required to be continued. He reported minimal knee pain on VAS with an improved feeling of wellness and overall functional health status. The follow-up data suggests the sustained effect of the IYN protocol. His reports indicate good long-term glycemic control, assessed through HbA1C. Though serum TSH

levels hiked on follow-up when compared to the discharge, it is within the normal levels, with tapered medications.

9. Discussion

A 6 week IYN protocol was given to a 50-year-old male participant with MetS. There was a significant improvement in all variables studied which continued to be within normal range at 12-weeks follow-up after discharge. He found the treatments holistic, easy to adopt and having faith in such holistic therapies helped him. The authors believe that the results are due to the integration of therapeutic fasting with sustained calorie restriction, naturopathy therapies, and yoga sessions. The therapeutic fasting was administered intermittently, having a one-day fasting per week followed by calorie restricted diet, with an average 800 kcal intake on non-fasting days. We may also attribute the improvement in the blood glucose and lipid profiles to the drastic weight reduction that he could achieve, leading to enhanced insulin sensitivity [4]. The integrated approach of yoga comprising of physical postures, breathing and meditation helped to manage psychological stress and thereby leading to the physical benefits, which is described through the *Adhija Vyadhi* model [10]. We also found that IYN protocol was easy to adhere and the results were sustained for 2 months following the discharge of the patient. We plan to follow-up the patient further to understand the long-term benefits of Yoga and Naturopathy based lifestyle interventions in MetS. This case also adds to growing clinical evidence of the use of Yoga and Naturopathy therapies in chronic non-communicable degenerative disorders [11,12].

The significant changes we found may be attributed to an integrated approach of Naturopathy and Yoga, as well as the whole hearted adherence of the patient. Although the initial 6 weeks were in an inpatient retreat center, the follow-up results could be attributed to the patient adherence to the follow-up protocol. Also, absence of family history may be contributing for changes observed. The outcomes of the study are encouraging to replicate similar module in patients with MetS and observe the effects further. The team of physician, yoga and naturopathy experts learnt about the concept and therapies for MetS from each other, and found it comfortable to integrate the practices.

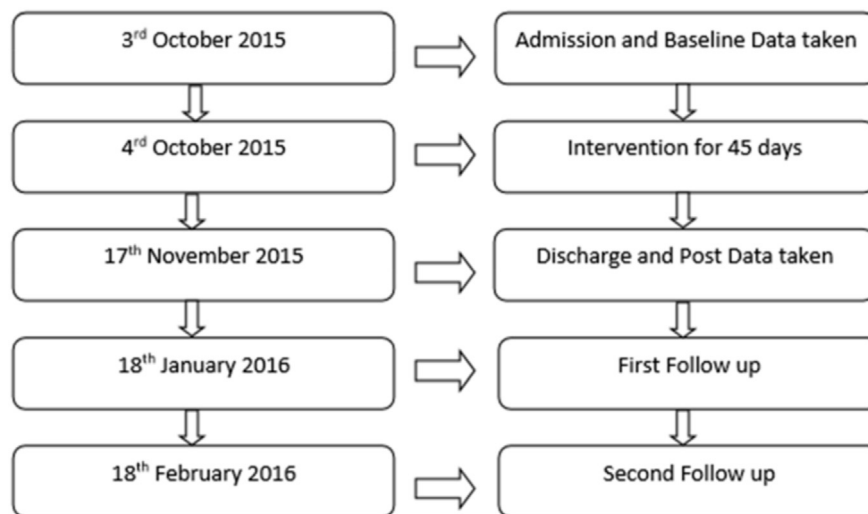


Fig. 1. Detailed profile of the study.

The strengths of the case study include strong positive effects of IYN protocol on health outcomes in MetS and the follow-up results. Further studies may be designed to establish the IYN protocol for MetS.

10. Conclusion

The case report shows remarkable changes in MetS status that improved the quality of life following a 6 week IYN intervention. The change was sustainable for 12 weeks through simple lifestyle modifications. Considering the effects achieved in this case, IYN could be used as a safe and beneficial intervention to integrate into the management of MetS.

Informed consent

An informed written consent was obtained from the patient for reporting this case.

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Conflicts of interest

There are no conflicts of interest.

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