

PHYSICAL ACTIVITY YOGA AND ITS EFFECT ON METABOLICT SYNDROME IN CENTRAL ZONE MADHYA PRADESH

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ABSTRACT: Metabolic syndrome is now considered as a serious public health problem, rising at an alarming rate in developed and developing countries of the world. It is estimated that 20- 25% of the world adult population is suffering from this disorder. Lifestyle change is recommended as treatment for adults at risk for metabolic syndrome (MetS), although adoption of new behavioral patterns is limited. In addition, most existing lifestyle interventions do not address psychological stress or quality of life, both of which impact the burden of MetS. Yoga, the ancient Vedic science was developed in India for improving spiritual health and wellbeing. In recent times yoga is widely used to improve health and to prevent and cure disorders. Yoga asana or specific posture, pranayama or controlled breathing and dhyana or meditation practice has its own specific and overall benefits. Yoga asana uses various postures to improve physical strength, flexibility, balance, co-ordination and endurance. Hence the present study was undertaken to find out the effect of yoga therapy in metabolic syndrome. Yoga, a form of physical activity that incorporates psychological components (e.g., maintaining attention, relaxation), is a promising intervention for improving the burden of MetS. This randomized controlled trial assessed the feasibility and preliminary efficacy of a 12-week yoga program coupled with an evidence-based health education program (HED) compared to HED alone. This is the first study that implemented lifestyle education along with yoga to evaluate the potential unique effects of yoga on participants at risk for MetS. Yoga is beneficial in maintaining good health and wellbeing by regulating body weight, improving Biochemical parameters and helpful to overcome the obesity related complications as well as metabolic risk factor.

KEYWORDS: Metabolic Syndrome, Obesity, Yoga Therapy, Central India Madhya Pradesh.

INTRODUCTION:-

Metabolic syndrome is now considered as a serious public health problem, rising at an alarming rate in developed and developing countries of the world. It is

estimated that 20-25% of the world adult population is suffering from this disorder. Metabolic Syndrome is a mixture of complications such as cardiovascular risk, Diabetes, Stroke. Any of these complications may affect the life of the person. Yoga can maintain the physical health, mental health and spiritual health too. Several studies proved that regular practice of yoga has many beneficial effects. This research mainly focuses how metabolic syndrome (a cluster of complications) can be prevented by yoga.

Metabolic syndrome (Mets) is not an illness in itself. Rather, it's a gathering of danger elements - hypertension, high glucose, higher cholesterol levels, and stomach fat. Clearly, having any of these danger components isn't serious. Be that as it may, when they're joined, they set the phase for significant issues. These complications lead to twofold danger of vein and coronary illness, which can increase heart problems and strokes.

The pathophysiology is exceptionally unpredictable and has been just somewhat illustrated. Most patients are more seasoned, large, stationary, and have a level of insulin resistance. The most vital danger variables are eating regimen (especially sugar sweetened drink utilization), hereditary qualities, stress, low physical action, reduced chronobiology/rest, temperament issue/ psychotropic drug use, and extreme liquor use.

Insulin resistance (IR) is a condition in which the body's cells get to be impervious to the impacts of insulin. That is, the ordinary reaction to a given measure of insulin is diminished. Thus, more elevated amounts of insulin are required with the goal insulin should have its appropriate impacts. In this way, the pancreas repays by attempting to create more insulin. This resistance happens in light of the body's own insulin (endogenous) or when insulin is regulated by infusion (exogenous).

Various markers of systemic irritation, including C-reactive protein, are regularly expanded, as are fibrinogen, interleukin 6, tumor necrotic factor alpha (TNF- α), and others. Some have indicated an assortment

of causes, including expanded uric acid levels brought on by dietary fructose. Late research shows delayed persistent anxiety can add to metabolic disorder by disturbing the hormonal parity of the hypothalamic-pituitary-adrenal pivot (HPA-axis). A useless HPA-hub causes high cortisol levels to flow, which results in raising glucose and insulin levels, which thus cause insulin-interceded impacts on fat tissue, at last advancing instinctive adiposity, insulin resistance, dyslipidemia and hypertension, with direct consequences for the bone, bringing on "low turnover" osteoporosis. HPA-hub brokenness may clarify the reported danger sign of stomach weight to cardiovascular sickness (CVD), sort type 2 diabetes and stroke. Psychosocial anxiety is additionally connected to coronary diseases.

Metabolic disorder is a danger component for neurological issue. A metabolic disorder happens when anomalous synthetic responses in the human body upset digestion system. When this happens, the patient may have a lot of a few substances, or too little of others, which are expected to stay solid. Scatters in digestion system can be acquired, in which case they are otherwise called characteristic blunders of digestive system, or they may be inherited. Numerous metabolic disorders exist; Phenylketonuria is a case of an acquired metabolic issue described by a powerlessness to separate one of the building squares of protein, the amino corrosive phenylalanine. Type I diabetes, an infection in which the pancreas does not make enough insulin to keep up adjusted glucose levels, is a metabolic issue of sugar digestion system.

Yoga is an ancient form of physical activity that emphasizes psychological components and benefits. Key psychological components of yoga include maintaining attention and relaxation (Desikachar;1995). Other studies of yoga for MetS have demonstrated promising results for improving cardiometabolic health, although further, more methodologically rigorous studies are needed. In addition, few studies have investigated the influence of yoga on psychological stress and quality of life outcomes in people with MetS. Results from these studies are equivocal compared with those comparing yoga to a wait-list control group finding that yoga improves energy levels, general health perceptions, the physical component of quality of life, and social functioning; however, in another study, yoga was found to be less useful than stretching for improving perceived stress. Conclusions that can be drawn from existing studies are further restricted due to the preliminary nature of the methodology that could be improved with stronger comparison groups and more systematic descriptions of and justification for the yoga protocol.

Yoga is thought to work by getting to parasympathetic pathways in the autonomic sensory system and revitalize the unwinding reaction Neuro-hormonal pathways, for example, the renin angiotensin aldosterone complex, are thought to be vital in the control of increased heart rate, increased pulse, myocardial localized necrosis, atrial fibrillation, and congestive heart disappointment. These same neuro-hormonal pathways additionally are thought to be effective as the instruments of yoga. Because of its impact on numerous components in autonomic pathways, yoga has positive effects on reports of stress and heart rate variability. Yoga practice weakens psychological complications, advances wellbeing, and can be efficacious in self-care in the avoidance and upkeep of cardiovascular and metabolic wellbeing various studies are conducting by utilization of yoga in preventing the metabolic syndrome.

In a prior publication (Birdee et. al., 2015) we established the feasibility of combining health education and yoga into a single intervention for people with MetS, including strong adherence to the research protocol (>80%), although the study was not adequately powered to show statistical differences between the health education plus yoga group and the health education alone group on the primary outcome variables of interest related to cardiometabolic risk reduction (i.e., weight, blood pressure, lipids, and insulin resistance). Patterns in the data that were not statistically significant showed that participants at higher cardiometabolic risk (measured by insulin resistance) may gain additional benefit from yoga than a health education program alone. This overall study design aimed to match the education content in both study groups to control for expectancy and behavioral education in order to isolate the specific effects of yoga. Careful consideration was also given to systematically developing and describing the rationale for the yoga intervention, which allows future researchers to judge the quality of this trial and build upon knowledge gained (Sherman K. J., 2012). This prior publication, however, did not report on data on the secondary, patient-reported outcomes that were also obtained in the trial.

Dyslipidemia or hyperlipidemia attributed to bad life style and absence of physical activities is now considered as one important factor in developing the cardiovascular diseases (De. Freitas et. al ; 2013).

This age category (20-30 years old) is important to predict cardiovascular risk factors in the next 20-30 years of life (Zemdegs et. al. 2011), Bad habits like fast food intake, lack of exercise that enable burn out the excess lipid in blood , with other Familial factors may lead to a gradual deposit of bad lipid (LDL-C, total

serum cholesterol and non HDL-C group (Aziz et.al. 2003) Many studies indicate that there is a strong relationship between overweight people (obesity) and high levels of cholesterol, TC , LDL-c, and a decreased level of HDL-c (Njelekela et.al. 2002). Measuring the lipid profile (total cholesterol – TC, HDL-c, TG , LDL-c and Non HDL) and the body mass index are considered to correlate their importance in deciding the risk factors of atherosclerosis (R. M. Oliver; 1967).

The objective of the current set of analyses, therefore, is to assess perceived stress, related psychological constructs (i.e., mood, perceived health competence, and mindfulness), and quality of life as secondary outcomes in a randomized controlled study that compared a yoga program combined with an evidence-based health education program (HED) to HED alone in people at risk for MetS. We hypothesized that the yoga program combined with HED would result in greater reductions in stress and improvements in related psychological outcomes and quality of life than HED alone.

MATERIAL AND METHODS:

Studying group

This is a cross-sectional study conducted with human, of both genders in the period January-December 2017. This study was performed on central India Madhya Pradesh 20-66 years old regardless of sex.

Measurements:

Metabolic disorder happens when any person has three or a greater amount of the following:

- ❖ Abdominal weight (Waist perimeter of 40 inches or above in men, and 35 inches or above in ladies)
- ❖ Triglyceride level of 150 mg for every deciliter of blood (mg/dL) or more prominent
- ❖ HDL cholesterol of under 40 mg/dL in men or under 50 mg/dL in ladies
- ❖ Systolic circulatory strain (top number) of 130 m, of mercury (mmHg) or more prominent, or diastolic pulse (base number) of 85 mmHg or more prominent.
- ❖ Fasting glucose of 100 mg/dL or more prominent.

Table (1): Table No. 1. Example weeks from the progressive yoga protocol.

Activity-Sanskrit name	Type	Position	Basic description
<i>Yoga weeks 1 and 2</i>			
(1) <i>Tadasana</i>	Movement	Standing	Bilateral arm abduction
(2) <i>Virabhadrasana</i>	Movement	Standing	Forward lunge with anterior arm extension
(3) Modified <i>Urdhva mukha svanasana</i>	Movement	Standing	Forward hip flexion and extension while leaning on chair
(4) <i>Utkatasana</i>	Movement	Standing	Squat
(5) <i>Pranayama</i>	Breathing	Lying on back	Observe breath
(6) <i>Eka pada apanasana</i>	Movement	Lying on back	Flexion of hip, one leg at a time
(7) <i>Jathara paravritti</i>	Movement	Lying on back	With knees bent bring knees together towards the floor, alternating sides
(8) <i>Apanasana</i>	Movement	Lying on back	Flexion of hip, both legs at same time
(9) <i>Jala bhavana</i>	Meditation	Sitting	Water visualization
<i>Yoga weeks 11 and 12</i>			
(1) <i>Tadasana</i>	Movement	Standing	Raise arms from sides overhead and come up onto toes
(2) Modified <i>urdhva mukha svanasana</i>	Movement	Standing	Back extension while leaning on chair
(3) <i>Utkatasana</i>	Movement	Standing	Squat
(4) <i>Pranayama</i>	Breathing	Lying on back	Extending exhale

Activity-Sanskrit name	Type	Position	Basic description
(5) <i>Jathara paravritti</i>	Movement	Lying on back	With knees bent bring knees together towards the floor, alternating sides
(6) <i>Eka pada apanasana</i>	Movement	Lying on back	Flexion of hip, one leg at a time
(7) <i>Jathara paravritti</i>	Movement	Lying on back	Both legs together placed laterally
(8) <i>Urdhva prasrita padasana</i>	Movement	Lying on back	Raise arms overhead and extend both legs towards ceiling
(9) <i>Mahamudra</i>	Movement	Sitting in chair	With one leg bent, hip abducted, reach for foot with hands keeping back arched.
(10) <i>Cakravakasa</i>	Movement	Kneeling	From kneeling bent forward position, shift weight forward while making back slightly arched
(11) <i>Pranayama – sitali</i>	Breathing	Sitting	Extend exhale using tongue breath
(12) <i>Jala bhavana</i>	Meditation	Sitting	Water visualization

RESULTS:

The study was described as a lifestyle education intervention to support weight reduction, reduce blood pressure, and improve cholesterol without mention of mind-body practices or yoga.

Metabolic disorder is accompanied by central obesity, dyslipidemia, compromised fasting glucose, and hypertension. Shockingly, these components add to harm the endothelium that thus, will deduce in the advancement of different confusions saw in the metabolic disorder. Endothelial dysfunction is chiefly brought about by a diminishing in nitric oxide (NO) accessibility because of decreased NO generation and increment in oxygen-inferred free radicals (ROS) that can respond with NO and inactivates the dynamic atom (Halcox et. al., 2014).

Most broadly the metabolic syndrome components are atherogenic dyslipidemia, raised circulatory strain, and lifted plasma glucose. People with these qualities ordinarily show a prothrombotic state. Atherogenic dyslipidemia comprises of a total of lipoprotein variations from the group including raised serum triglyceride and Apo lipoprotein B (apoB), expanded little LDL particles, and a decreased level of HDL cholesterol (HDL-C). The metabolic disorder is regularly suggested as a discrete element with a solitary cause. The dominating hidden danger variables for the disorder have stomach obesity and insulin resistance other related conditions can be physical inactivity, aging, and hormonal imbalance. An atherogenic diet (e.g. an eating regimen rich in soaked fat and cholesterol) can improve

hazard for creating cardiovascular sickness in individuals with the disorder, in spite of the fact that this eating regimen is not recorded particularly as a fundamental danger component for the condition. Numerous metabolic pathways have additionally been proposed to connection insulin resistance and compensatory hyperinsulinemia to the next metabolic danger elements. In spite of the fact that insulin-safe people need not be clinically large, they all things considered generally have a strange fat conveyance that is portrayed by prevalent abdominal area fat (Hamrani ; 2013). Abdominal area fat corresponds with insulin resistance. Overabundance abdominal area fat can accumulate either intra peritoneally (instinctive fat) or subcutaneously. Numerous agents assert that overabundance instinctive fat is more certainly connected with insulin resistance than other fat tissue compartment.

Regardless of the relative commitments of instinctive fat and stomach subcutaneous fat to insulin resistance, an example of stomach (or abdominal area) adiposity associates all the more certainly with insulin resistance and the metabolic disorder than lowers body obesity (Innes E.K., 2005). An interesting component of abdominal area adiposity is a strangely high arrival of no esterified unsaturated fats from fat tissue this adds to amassing of lipid in locales other than fat tissue. Ectopic lipid aggregation in muscle and liver apparently leads to insulin resistance and dyslipidemia. Several late reports demonstrate that the metabolic disorder is connected with more serious danger for cardiovascular disease, yet once type 2 diabetes mellitus raises, cardiovascular danger increases even more. Finally, insulin resistance

and the metabolic disorder are connected with an assortment of other conditions some of these are fatty liver, polycystic ovary syndrome, cholesterol gallstones, rest apnea, lipodystrophies and protease-inhibitor treatment for HIV.

Management of Metabolic Syndrome

The essential objective of clinical administration in people with the metabolic disorder is to decrease hazard for clinical atherosclerotic element. Indeed, even in individuals with the metabolic disorder, first-line treatment is coordinated toward the real hazard variables: LDL-C above objective, hypertension, and diabetes. Prevention of sort 2 diabetes mellitus is another essential objective when it is not present in a man with the metabolic disorder. For some people with diabetes, hazard component administration must be strengthened to reduce their higher danger for metabolic syndrome. The primary objective for prevention of the metabolic disorder fundamentally is to relieve the modifiable, hidden danger variables (corpulence, physical activity, and atherogenic diet) through way of life changes. Lifestyle change successfully will reduce the greater part of the metabolic danger components. At that point, if danger is sufficiently high, thought can be given to consolidating drug treatment to the regimen. The need of medication treatment is rises of LDL-C, circulatory strain, and glucose; current rules for their administration to be taken after. Identifying metabolic syndrome is some portion of general risk assessment for cardiovascular infection.

Although numerous individuals might be hereditarily defenseless to the metabolic disorder, rarely does it turn out to be clinically showed without over weight and physical laziness. Thus, treatments to relieve these fundamental danger components constitute first-line component. The motivation to change hidden danger variables is to anticipate or defer onset of cardiovascular diseases and if type 2 diabetes mellitus is not officially present, a corresponding objective is to anticipate it also. Both weight reduction and maintenance of a lower weight are best accomplished by a mix of decreased caloric administration and expanded physical action and the utilization of standards of lifestyle change. At present accessible weight reduction drugs have restricted utility in the administration of stoutness.

Increasing physical activity helps with weight reduction. It additionally has beneficial effects on metabolic risk factor. Beyond weight ability to control and decrease of aggregate calories, the eating regimen diet should be low in soaked fats, Trans fats, cholesterol, sodium, and straightforward sugars. Compelling weight reduction requires a mix of caloric confinement, physical

movement, and inspiration; successful long lasting support of weight reduction basically requires a harmony between caloric admission and physical action.

Physical Activity is very essential to manage the metabolic syndrome. Yoga helps in maintaining the body physically fit. To reduce the risk of the metabolic syndrome physical fitness is necessary. Several methods are there in yoga. Some of them are Asanas, Pranayamas, Kriyas. The Asanas which prevent the diabetes are Suryanamashkaras, Arthamatsyendrasana, Paschimoothana, Hamsa, Mayura, Jatariparivarthana asana. Pranayamas include Suryabhedana, Chandra Bhedana, Seethli, Seetkari, Brahmari, Bastrika, Nadisodhana. As Cardiovascular risk patients' needs utmost care. So those asanas performed for preventing diabetes should not be performed by cardiac patients. The cardiac patients should practice simple asanas like thadasana and they should avoid practice of complicated asanas and pranayamas. They should not practice forceful pranayamas like bastrika. Nadisodhana is the best fit pranayama for cardiac patients. A detailed procedure and benefits for all these yogic techniques is provided by Yogacharya Rao RR.(2003) . Meditation and pranayama's will help to keep the mind relaxed and improves the concentration power too Harinath K. (2004).

DISCUSSION:-

Regular practice of yoga has several beneficial effects. Several studies proved the advantages of yoga. So, Metabolic Syndrome a cluster of complications can also be prevented by regular practice of yoga. Healthy diet also plays key role in preventing these complications. This research presented the brief note regarding metabolic syndrome and its management by alternative measures like yoga.

CONCLUSION:-

Yoga therapy is beneficial in maintaining good health by regulating BMI, improving the biochemical functions of the body and helpful to overcome the complications of obesity and reduces the metabolic risk factors. This may have direct impact on the use of yoga therapy as a safe and cost effective therapeutic modality in combating metabolic syndrome and obesity.

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