



## Isolated and Combined Effect of Yoga and Aerobic Training on Insulin Response of Untrained Colligate Men

### KEYWORDS

Yoga, Aerobic, Insulin, Men.

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**ABSTRACT** Recorded history, philosophy and health professionals have observed that regular physical activity is an essential part of healthy life. Aerobic exercise and asanas (yoga) are the best method to maintain good health. Both forms of physical activity may cause cellular level of changes. It ultimately leads to adaptation in endocrine system. The most common problems among the youth is inactivity. It causes all types of hypokinetic diseases; one of the most vulnerable is diabetics. It is a metabolic disorder due to insulin deficiency. Therefore, the study aim to found out the isolated and combined effect of yoga and aerobic training on insulin response of untrained colligate men. To achieve these purpose sixty (N = 60) male untrained Bachelor's degree students were selected randomly from Tagore Arts College, Puducherry, India. There age ranged from 18 to 22 years. The subjects were randomly divided into four equal groups (n = 15). Group I underwent yoga training, Group II underwent aerobic training, Group III underwent combined (aerobic + yoga) training and Group - IV did not participate in any special training. 24 hrs before and after the training 5 ml of blood was drawn from all the subjects (vein) as pre and post sample for analysis. The insulin (mlu/ml) response was estimated by Radio Immuno Assay Procedure. The collected data were analysed by ANCOVA and Scheffe's post hoc test ( $p < 0.05$ ) which SPSS package (16.0). The results of this study indicates that aerobic, yoga and combination of both training may reduce serum insulin level of untrained man. However among these, combination of yoga (asana) and aerobic exercise have better effect on the reduction of insulin.

### INTRODUCTION

The competitive nature of human being is as old as his origin. One of the most exciting and rewarding aspects of life is the experience of going beyond what were once thought to be limitations. Performance and fitness can be increased or improved to a great extent only by causing biological adaptation and this is possible only through systematic and scientific training.

Some of the confusions about the potential benefits of exercise have arisen because the terms of the arguments have not defined. Exercise is not a single entity, there are many kinds of exercises which vary in intensity, frequency and duration and having variable effects on body system. Exercise may favourably modify the natural history of a number of chronic diseases. It confers increased physical abilities and improves the quality of life [1]. Some researchers have reported that endurance exercise can adaptively change anaerobic type muscle tissue to an aerobic variety by increasing the size and number of components. However, this interpretation is still under investigation. Yoga is a form of medicine. The fact that it can prevent and cure many ailments has been accepted. Therefore, it should not be viewed as an alternative system of medicine but as a primary form in those areas in which yoga alone is needed to cure ill health.

Unlike medicine, yoga has never changed its theories in relation to health and disease. It has given clear-cut guidelines both for prevention and cure. Today when, in despair at the failure of western medicine to deliver every time, all are turning to natural remedies, yoga is coming into its own. The relation between the psyche and soma is harmonized by the practice of yoga. Drugs may cure illness, but the basic inner foundation for achieving health, the harmonization of the inner psyche, is not established. Yoga is of most value in this. Yoga practice decreases fasting and post-prandial blood glucose level of NIDDM. The exact mechanism as to how these postures and controlled

breathing interact with somatoendocrine mechanism affecting insulin kinetics was worked out [2].

The endocrine system includes all tissues or glands that secrete hormones. A unique feature of hormones is that they travel away from the cells that secrete them and specifically affect the activities of other cells and organs. Some affect many body tissues, whereas others affect only specific target cells. Insulin is a hormone produced by pancreas. It regulates the level of utilization of blood sugar, RNA and protein synthesis as well as the metabolism and storage of fats. Specifically it controls the absorption of glucose. Low levels of insulin results in increased level of blood sugar [3]. Therefore, the study aim to found out the isolated and combined effect of yoga and aerobic training on insulin response of untrained colligate men.

### METHODOLOGY

To achieve these purpose sixty (N = 60) male untrained Bachelor's degree students were selected randomly from Tagore Arts College, Puducherry, India. There age ranged from 18 to 22 years. The subjects were randomly divided into four equal groups (n = 15). Group I underwent yoga training (Sarvangasana, Halasana, Matsyasana, Pashchimatasana, Bhujangasana, Shalabhasana, Dhanurasana, Ardha-Matsyendrasana and Shavasana - 40 to 60 min/session/4 days/week for 12 weeks). Group II underwent aerobic training (warm-up walking, jogging, running and cool down - 65% to 80% THR-Karvonen formula - 40 to 60 min/session/4 days/week for 12 weeks). Group III underwent combined (aerobic + yoga) training (Alternative sessions as mentioned in group I & group II) and Group - IV did not participate in any special training. 24 hrs before and after the training 5 ml of blood was drawn from all the subjects (vein) as pre and post sample for analysis. The insulin (mlu/ml) response was estimated by Radio Immuno Assay Procedure [4] at Arthy Scan and Diagnostic Centre, Puducherry. The collected data were analysed by ANCOVA and Scheffe's post hoc test ( $p < 0.05$ ) which SPSS package

(16.0).

**RESULTS****Table I. ANCOVA of Control and Experimental Groups on Insulin (mlu/mL)**

	Yoga	Aerobic	Combined	Control	SOV	SS	Df	MS	F-ratio
Adjusted post-test mean	7.886	7.740	7.315	8.945	B	21.533	3	7.178	31.96*
					W	12.352	55	0.225	

\*p &gt; 0.05

**Table II. Scheffe's Post hoc Test Comparison of Mean on Insulin**

	Aerobic	Combined	Control	Confidence interval
Yoga	0.146	0.571*	1.059*	0.528
Aerobic	-	0.425	1.205*	
Combined	-	-	1.603*	

From table I it is clear that, there is a significant difference among adjusted post-test means of yoga, aerobic, combined and control groups on insulin secretion. From table II it is inferred that all three experimental groups reduced serum insulin level than control. However, among the training combined (aerobic + yoga) responded more positively in the reduction of serum insulin level.

**DISCUSSION**

The classic example of neural stimulation is sympathetic activation of the adrenal medulla to release the catecholamines, epinephrine and non-epinephrine, during periods of stress. In certain cases the nervous system overrides normal endocrine control in an effort to maintain homeostasis. The release of insulin by pancreatic cells, for example, is prompted by increasing blood sugar. Because insulin promotes glucose entry into tissue cells, blood sugar levels, soon decline, thus ending the initiative for insulin release. During exercise of increasing intensity and duration, the circulating levels of blood glucose and insulin progressively decrease as a result of inhibitory effect of increased alpha-adrenergic input to the beta cells [5]. This directly enhances hepatic glucose output and sensitizes the liver to the effects of glycogen and epinephrine. These actions help to maintain blood glucose [6]. As insulin output becomes reduced in exercise of long duration, progressively more energy is derived from the mobilization and metabolism of the free fatty acids [7]. Physical training actually increases a person's sensitivity to insulin, consequently, less insulin would be required to regulate blood glucose after training before [8,9].

Exercise has pronounced effects on glucose tolerance and insulin action [10] and the peripheral insulin concentration is well known to decrease during prolonged exercise [11]. Studies conducted in human using measurements of c-peptides and insulin concentration in peripheral blood indicates that both secretion and removal of insulin are altered during exercise [12]. Exercise training used as a therapeutic modality alone or in combination with diet, insulin or oral hypoglycemic drugs have major effects on circulating levels of glucose and insulin. In this context exercise training has been used as a mean to improve oral glucose tolerance and enhance insulin sensitivity [13]. In the present study all the three training groups reduced insulin

level in blood.

Hatha yoga and conventional physical training exercise may have therapeutic preventative and protective effects on diabetes mellitus by decreasing oxidative stress and improving antioxidant stress [14]. Six month yoga practice reduce basal metabolic rate than the sedentary [15]. Short-term yoga reduced fasting plasma glucose [16]. Serum insulin levels after the organs were lower than those baseline data. The observations suggest that the performance of asanas led to increased sensitivity to the cells of pancreas to the glucose signal [17]. Yoga and traditional physical training reduce serum insulin and blood glucose level and increase the percentage insulin binding receptor [18].

The results of this study indicates that aerobic, yoga and combination of both training may reduce serum insulin level of untrained man. However among these, combination of yoga (asana) and aerobic exercise have better effect on the reduction of insulin.

**CONCLUSION**

From the results and boundaries of this study it is concluded that aerobic exercise, yoga (asana) and combination of yoga and aerobic programme may reduce and control the serum insulin level. However, among these programme combined training may have better effect on the reduction of insulin of untrained men.

**IMPLICATION**

Asana (Yoga), aerobic and combined training will be recommended as exercise or therapy to control and reduce the serum insulin level of untrained men.

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