International Journal of Physical Education, Sports and Health 2016; 3(1): 183-188

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 4.69
IJPESH 2016; 3(1): 183-188

www.kheljournal.com
Received: 14-11-2015
Accepted: 16-12-2015

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Effect of specific yogic exercises and combination of specific yogic exercises with autogenic training on selected biochemical variables of climacteric women

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Abstract
The purpose of the study is to find out effect of specific yogic exercises and combination of specific yogic exercises and autogenic training on selected biochemical variables of climacteric women. To study the effect of the combination of selected yogic exercises and autogenic training on selected biochemical variables such as high density lipoprotein, low density lipoprotein, fasting blood sugar, hemoglobin, blood urea of the climacteric women, To study the effect of the of selected yogic exercises programme on selected biochemical variables of the climacteric women and to compare the groups. This study was formulated using random group design consisting of specific yogic exercises and combination of specific yogic exercises with autogenic training groups. The subjects (N=60) were divided at random, into three equal groups of twenty climacteric women in each, the groups were subjected to pre-test prior to the experimental treatment. The experimental groups participated in their respective duration of twelve weeks, six days in a week throughout the study. The various tests administered were: prior to training (pre-test), mid period of training sixth week (second-test) and twelfth week (post-test) of the training schedule. The results of the study indicate that the experimental groups namely Specific yogic exercises group, and Combination of specific yogic exercises with autogenic training group significantly improved in their performance as selected dependent variables, when compared to the control group. It also found that the improvement caused by combination of specific yogic exercise group with autogenic training was greater when compared to specific yogic exercises group in the selected dependent variables.

Keywords: Climacteric, Yoga, Autogenic, High density lipoprotein, Low density lipoprotein, Blood sugar.

Introduction
The climacteric period in a woman's life is that period which begins as a counterpoint to puberty, and ends sometime after menopause. It encompasses the series of physical, emotional and psychic changes a woman encounters during her later sexual maturity. (Blanco 2009) [5]
Climacteric is the phase of warning ovarian activity, and may begin two to three years before menopause and continue for two to five years after it. The climacteric is thus a phase of adjustment between the active and inactive ovarian function and occupies several years of woman's life, and involves physical, sexual and psychological adjustments. (Shaw *et al*. 1994)
Climacteric symptoms are so closely associated with the menopause to be practically considered its hallmark. However, symptoms can already appear before the onset of menopause. The frequency, extent and intensity of symptoms are dependent on social factors, body composition, race and geographical region. In about 20-25% of menopausal women they do not occur at all. These symptoms are most prominent in women who are suddenly deprived of their endogenous estrogen secretion, for instance by bilateral ovariectomy, particularly in younger women. (Schindler 2006) [5]
Yoga is a gift for old age. One who takes to yoga during old gains not only health and happiness but also freshness of mind, since yoga gives one a bright out look of life, and one can look forward to a happier future rather than looking back into the past which has already entered into darkness. The loneliness and the nervousness which create sadness and sorrow are destroyed by yoga as a new life begins. Hence it is never too late to begin. Yoga if started in old age is a rebirth which teaches one to face death happily, peacefully, and courageously.

Hence nobody is exempted from doing yoga practice and there are no excuses for not doing yoga. Effects of yoga can only be understood by practicing it. (Iyengar, 1983) [2]

Biochemical Variables

Biochemistry is the application of the tools and concepts of chemistry to living systems. Biochemists study such things as the structures and physical properties of biological molecules, including proteins**,** carbohydrates**,** lipids**,** and nucleic acids.

Low Density Lipoprotein (LDL)

LDL enables fats and cholesterol to move within the water based solution of the blood stream. LDL also regulates cholesterol synthesis at these sites. LDL cholesterol is therefore considered the "bad" cholesterol

High Density Lipoprotein (HDL)

High Density Lipoprotein (HDL) is commonly referred to as the "good cholesterol." Unlike to LDL, the low-density lipoproteins that should be at low levels, HDL levels in the body are supposed to be fairly high.

Blood Sugar

Blood sugar, also known as blood glucose, is the body's fuel that feeds the brain, nervous system, and tissues. A healthy body makes glucose not only from ingested carbohydrates, but also from proteins and fats, and would not be able to function without it.

Hemoglobin

Hemoglobin is a protein-based component of red blood cells which is primarily responsible for transferring oxygen from the lungs to the rest of the body.

Blood Urea

Blood Urea Nitrogen (BUN) measures the amount of urea nitrogen, a waste product of protein metabolism, in the blood. Urea is formed by the liver and carried by the blood to the kidneys for excretion.

Yogic exercise and autogenic training is very effective means to cure urinary disorders. Back bends are valuable tools against progression of renal lesions. More over yogic exercise balances the weight of the person without losing the strength. The autogenic training technique is one of the self-help techniques which enable the individual to manage health and other problems successfully Yogic exercises cause the muscles to absorb the excess glucose in the blood, thereby reducing the blood sugar level. They help the pancreas and liver to function effectively, which regulates the blood sugar levels. Asanas help in rejuvenating the pancreatic cells, thereby assisting insulin secretion. Regular daily Yogic asana, Pranayamas and Kriyas help in the proper absorption of food by the body. It increases the normal body temperature and base metabolic rate during several weeks of exercise.

Autogenic training is a relaxation technique which promotes relaxation by reducing the activity of the sympathetic nervous system, which in turn leads to decrease in blood pressure, heart rate, respiratory rate, and muscle tension and it also reduces the risk of cardiovascular diseases which is related to menopause.

Statement of the Problem

The purpose of the study is to find out effect of specific yogic exercises and combination of specific yogic exercises and autogenic training on selected biochemical variables of climacteric women.

Objectives of the Study

1. To study the effect of the combination of selected yogic exercises and autogenic training on selected biochemical variables such as high density lipoprotein, low density lipoprotein, fasting blood sugar, hemoglobin, blood urea of the climacteric women.
2. To study the effect of the of selected yogic exercises programme on selected biochemical variables
3. To compare the effect of the combination of selected yogic exercises with autogenic training group with selected yogic exercises group on selected biochemical variables
4. To compare the combination of selected yogic exercises with autogenic training group with control group on the selected biochemical variables
5. To compare the selected yogic exercises group with control group on the selected biochemical variables

Hypothesis

1. It is hypothesized that the practice of selected yogic exercise programme may result in significant improvement in the selected biochemical variables of the climacteric women.
2. It is hypothesized that the women, who are practicing both yogic exercise and autogenic training, would show better effect that are at the climacteric stage of 45 to 55 years facing menopausal problems, and overcome biochemical changes which would give better relief of menopausal problems.
3. It is hypothesized that the practice of combination of selected yogic exercise along with the autogenic training group may lead to significant improvement in the selected biochemical variables of the climacteric women than the selected yogic exercises programme group.
4. It is hypothesized that there may not be significant changes in the control group in the selected biochemical variables of the climacteric women.

Means and Methods

Sixty climacteric women of teaching faculty from various colleges in Coimbatore District, Tamilnadu, India were selected randomly and served as the subjects for the purpose of this study. The selected subjects were in the age group of 45 to 55 years.

Experimental Design

This study was formulated using random group design consisting of specific yogic exercises and combination of specific yogic exercises with autogenic training groups. The subjects (N=60) were divided at random, into three equal groups of twenty climacteric women in each. The groups were assigned the names as follows:

1. Experimental group I- Specific yogic exercise group.
2. Experimental group II – Combination of specific Yogic exercise with autogenic training group.
3. Control group.

All the groups were subjected to pre-test prior to the experimental treatment. The experimental groups participated in their respective duration of twelve weeks, six days in a week throughout the study. The various tests administered were: prior to training (pre-test), mid period of training sixth week (second-test) and twelfth week (post-test) of the training schedule.

Reliability of Test

The reliability of data was ensured by establishing the tester reliability, subject reliability and instrument reliability.

The testers competency was obtained by pre-test, mid-test, post-test process whereby the consistencies of results were obtained. As very high correlation was obtained, the tester competency in taking measurement and test reliability were accepted.

Subject Reliability

The above test, re-test co-efficient of correlation also established that the subject reliability was highly significant.

Statistical Technique

The following statistical techniques were used for the analysis of data in this study.

The purpose of the study was to determine whether the selected yogic exercises and combination of selected yogic exercises with autogenic training will improve the selected bio chemical variables of the climacteric women before and after the training programme of twelve weeks.

In order to find out whether the obtained differences between the means of the selected variables in the pre test and post test are statistically significant, repeated measures of Analysis of Variance (ANOVA) were applied. When the F- ratio was found to be significant, Newman Keul's test was applied to test which of the possible comparisons among the means were significant.

Analysis of Co-Variance (ANCOVA) was applied to determine the significance of mean difference between the three groups namely When F – ratio was found to be significant, the Scheffe's Post Hoc test was applied to test the significance of pairs of the adjusted final group means.

Analysis and Interpretation of the Data

Using descriptive analysis the status of the criterion variables high density lipoprotein, low density lipoprotein, fasting blood sugar, hemoglobin and blood urea (bio-chemical variables) of specific yogic exercise group, combination of specific yogic exercise with autogenic training group and control group were assessed before and after the treatment. Further final means of the groups were adjusted by taking in to consideration the initial means of the groups. The results of the means before (pre) and after (post) the treatment along with the adjusted post test means.

Descriptive analysis of Pre Test means of the specific yogic exercises group and combination of specific yogic exercise with autogenic training group and Control group on bio chemical variables, Analysis of Variance on Pre Test

Variables	Sources of variation	Sum of squares	Degree of freedom	Mean squares	F – value
	With in sets	258.00	57	4.53	
High density lipoprotein	Between sets	0.12	2	0.06	0.002
	With in sets	1138057	57	19.97	
Low density lipoprotein	Between sets	45.56	2	22.78	0.03
	With in sets	44240.6	57	776.15	
Fasting blood sugar	Between sets	7816.52	2	3908.26	9.85*
	With in sets	22615.9	57	396.76	
Hemoglobin	Between sets	0.03	2	0.017	0.011
	With in sets	83.99	57	1.473	
Blood urea	Between sets	8.49	2	4.25	0.32
	With in sets	755.56	57	13.26	

Descriptive analysis of pre test means of the specific yogic exercises group and combination of specific yogic exercise with autogenic training group and control group on variables, Analysis of variance on Post Test

Variables	Sources of variation	Sum of squares	Degree of freedom	Mean squares	F - value
High density lipoprotein	Between sets	111.66	2	55.83	3.38*
	With in sets	940.15	57	16.49	
Low density lipoprotein	Between sets	666.19	2	333.09	0.65
	With in sets	29141.9	57	511.62	
Fasting blood sugar	Between sets	7889.8	2	3944.9	73.88*
	With in sets	3043.39	57	53.39	
Hemoglobin	Between sets	1.521	2	0.76	1.19
	With in sets	36.14	57	0.63	
Blood urea	Between sets	12.05	2	6.027	0.62
	With in sets	550.77	57	9.66	

Analysis of co-variance for the means difference among the specific yogic exercises group and combination of specific yogic exercise with autogenic training group and control group in selected variables

Variables	Sources of variation	Sum of squares	Degree of freedom	Mean squares	F - value
	With in sets	50.96	56	0.91	
High density lipoprotein	Between sets	105.55	2	52.78	28.82*
	With in sets	102.52	56	1.83	
Low density lipoprotein	Between sets	628.58	2	314.29	0.68
	With in sets	25725.6	56	459.38	
Fasting blood sugar	Between sets	3359.28	2	1679.64	55.79*
	With in sets	1686.07	56	30.10	
Hemoglobin	Between sets	1.555	2	0.77	1.37
	With in sets	31.63	56	0.56	
Blood urea	Between sets	10.73	2	5.37	0.55
	With in sets	547.93	56	9.78	

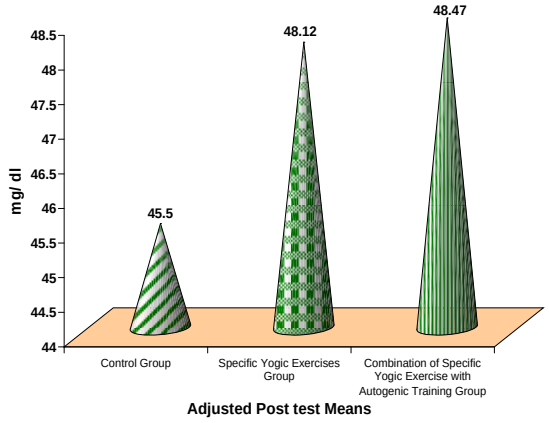
* Significant at 0.05 levels.

Results

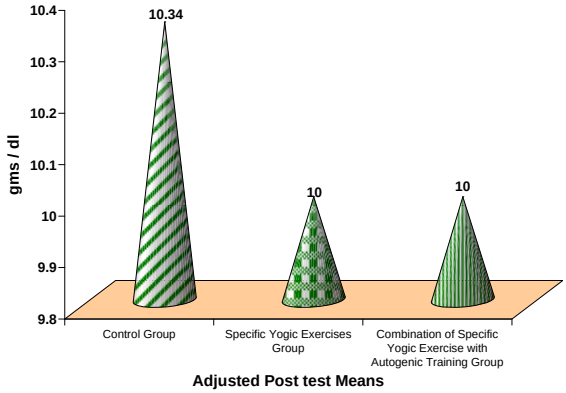
Scheffe's post hoc test of significance between paired adjusted post test means on the selected physiological psychological and Biochemical variables.

Variables	Adjusted Post Test Means			Mean difference	Scheffe's F-value
	Control	*SYEG	*SYEATG		
High density lipoproteins (mg/dl)	45.50	48.120		2.62	37.519*
	45.50		48.47	2.97	48.273*
		48.120	48.47	0.35	0.677
Fasting blood sugar (mgs./dl)	93.28	74.347		18.93	118.95*
	93.28		75.45	17.83	105.55*
		74.347	75.45	1.10	0.403

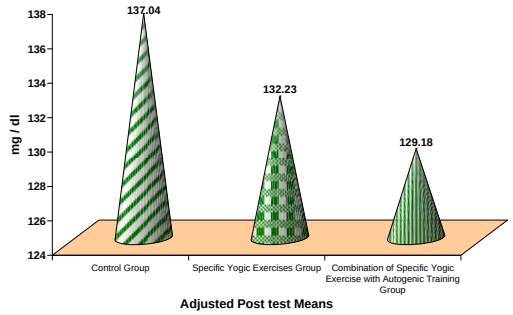
* Specific yogic exercises group.
* Specific yogic exercises with autogenic training group.



Adjusted Post Test Mean Values of Control, Specific Yogic Exercises and Combination of Specific Yogic Exercise with Autogenic Training Groups on High Density Lipoprotein



Adjusted Post Test Mean Values of Control, Specific Yogic Exercises and Combination of Specific Yogic Exercise with Autogenic Training Groups on Hemoglobin



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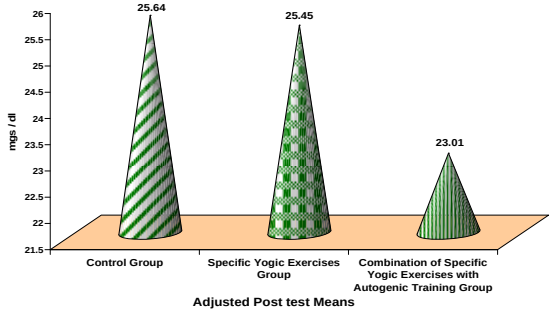
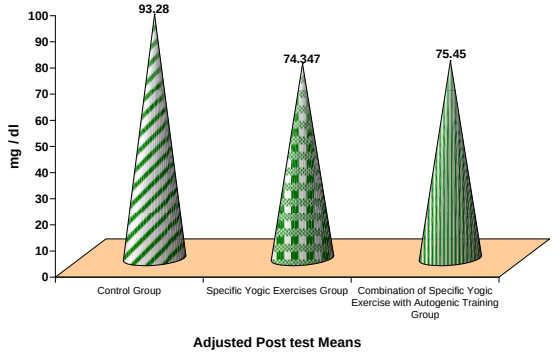
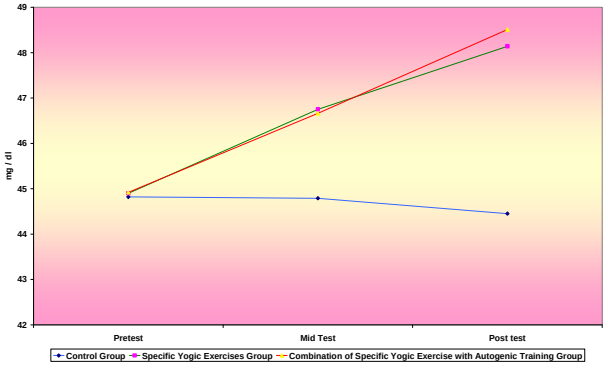


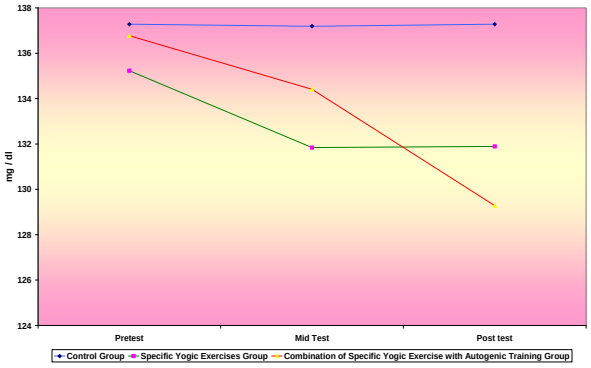
Adjusted Post Test Mean Values of Control, Specific Yogic Exercises and Combination of Specific Yogic Exercise with Autogenic Training Groups on Blood Urea



Adjusted Post Test Mean Values of Control, Specific Yogic Exercises and Combination of Specific Yogic Exercise with Autogenic Training Groups on Fasting Blood Sugar



Mean Values of Control, Specific, Yogic Exercises and Combination of Specific Yogic Exercise with Autogenic Training Groups during Pre, Mid and Post Tests On High Density Lipoprotein



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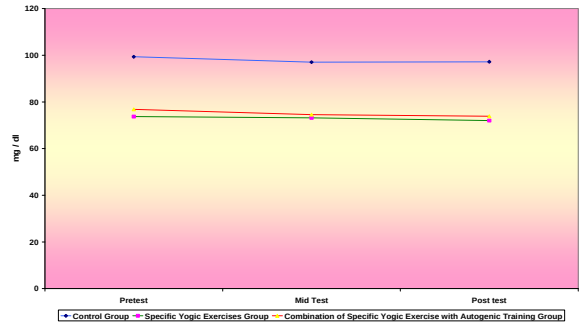

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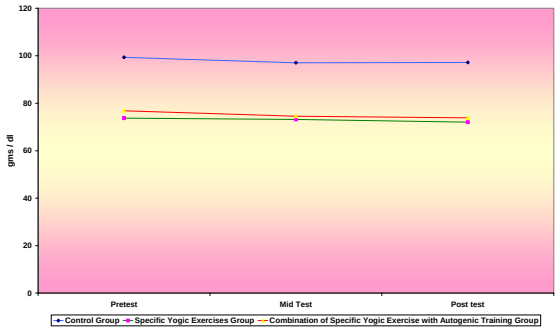
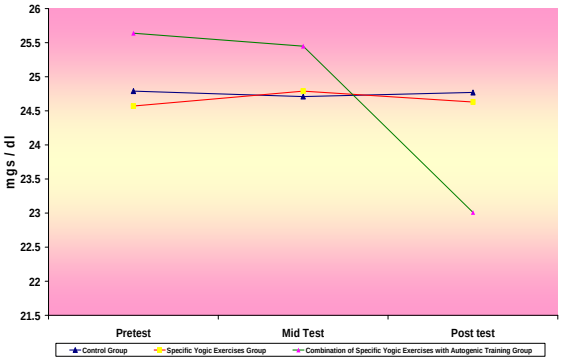


Mean Values of Control, Specific, Yogic Exercises and Combination of Specific Yogic Exercise with Autogenic Training Groups during Pre, Mid and Post Tests On Hemoglobin



Mean Values of Control, Specific, Yogic Exercises and Combination of Specific Yogic Exercise with Autogenic Training Groups during Pre, Mid and Post Tests On Blood Urea

Discussion on Findings

Comparative effects

The results of the study indicate that the experimental groups namely Specific yogic exercises group, and Combination of specific yogic exercises with autogenic training group significantly improved in their performance as selected dependent variables high density lipoprotein, low density lipoprotein, fasting blood sugar, hemoglobin and blood urea, when compared to the control group. It also found that the improvement caused by combination of specific yogic exercise group with autogenic training was greater when compared to specific yogic exercises group in the selected dependent variables such as high density lipoprotein and blood urea for the period of twelve weeks to the climacteric women.

Progress after the treatment period

The most fundamental requirement for women is maintenance of health during the climacteric stage. Yoga and autogenic training is a gift for climacteric women. It is also stated that the combination of specific yogic exercises group with autogenic training improves in dependent variables such as high density lipoprotein, and blood urea. The findings of the study are supported by the following authors

Cohen BE (2007) suggested that yoga is an acceptable intervention in this population, to explore the efficacy of restorative yoga for treatment of menopausal symptoms would be safe and feasible.

Anjum Sayyed (2010) observed that Sudarshan Kriya Yoga may play vital role in reducing total cholesterol and significantly increasing HDL-cholesterol and improvement in all Pulmonary Function.

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Yang (2009) found that yoga group experienced improvements in weight, blood pressure, insulin, triglycerides and exercise self-efficacy indicated by small to large effect sizes.

Schmidt (1997) supported that Urinary excretion of adrenaline, noradrenaline, dopamine, aldosterone, as well as serum testosterone and luteinizing hormone levels were reduced, while cortisol excretion increased significantly after the three months yoga and meditation programme.

Conclusions

From the analysis of data, the following conclusions were drawn.

1. Specific yogic exercises group and combination of specific yogic exercises with autogenic training group have achieved significant improvement on biochemical variables when compared to control group.
2. Significant differences were found among the Specific yogic exercises group and combination of specific yogic exercises with autogenic training groups towards improving the selected criterion variables such as, high density lipoprotein and fasting blood sugar.
3. It is concluded that combination of specific yogic exercises with autogenic training group found to better than the Specific yogic exercises group in selected biochemical variables such as high density lipoprotein and blood urea.

These conclusions suggest that the combination of specific yogic exercises with autogenic training group improves the health of the climacteric women by regularizing the high density lipoprotein and blood urea and get relief from the climacteric symptoms to lead a healthy and happy life.

Recommendations

1. Based on the major findings of the present study the following recommendations are made.
2. This study has proved that combination of specific yogic exercises with autogenic training programme enhanced all the selected biochemical variables.
3. It is suggested that the yoga instructors, yoga therapist to train the women who are facing menstrual problems and menopausal problems.
4. It is also recommended that the women at all level can follow this training to make their body fir for their daily routine.

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