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Effects of Yogic Practices With and Without Diet Modification on Lipid Profile and Anxiety among Pregnant Women

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Abstract

The aim of this study is to examine the effects of yogic practices on lipid profiles (Triglycerides, HDL, LDL) and anxiety among pregnant women in their second trimester. To achieve the purpose sixty (60) primiparous women were randomly selected from various maternal health centers in and around Chennai city. Their age varied between 23 Years to 28 Years. Subjects were randomly assigned into three groups. Experimental group I (20-subjects) Experimental group II (20) and Control group (20). Experimental group I underwent six days of yogic practices for one hour in the morning between 6.30 am to 7.30 am along with diet consultation. Experimental group II also underwent similar practices without any modification in their regular routine diet. Whereas control group did not undergo any training program except their regular maternal health check up. All the three groups were tested for blood lipid profile (Triglycerides, HDL, LDL) using standardized laboratory test and anxiety using state-trait anxiety inventory questionnaire. The data pertaining to the variables collected from all the three groups before and after the training period were statistically analyzed using Analysis of Covariance (ANACOVA) to determine the significant difference and tested at 0.05 level of confidence. The study reveals that Experimental groups show a significant difference in lipid profiles (Triglycerides, HDL, LDL) and anxiety than the control group. Experimental groups, I show the significantly better difference in lipid profiles (Triglycerides, HDL, LDL) and anxiety than Experimental group II due to yogic intervention along with diet modification. Hence the hypothesis was accepted at 0.05 level of confidence.

Keywords: Pregnancy: Yogic practices: blood lipid profile (Triglycerides, HDL, LDL): Anxiety.

Introduction

The accumulation of environmental factors in egg and sperm of parents contribute a lot to the formation of genetic material to the child. Many lifestyle factors including poor and unhealthy diet, obesity, smoking, drinking and also the age of the parents have an influence on transmitting the signals to the embryo, which in turn increase the risk of metabolic disorders such as diabetes, obesity, cardiovascular diseases, Anxiety, Immune dysfunction etc (Lane et al 2014). Women with moderate obesity during pregnancy, have an impact on birth weight and risk of metabolic disorders to their grandchildren leaving the risk of their own children (University of Edinburg 2013).

Genetic factors of parents, available nutritional status, social and cultural environment of pregnant women have an influence on birth weight of their babies (Rachel et al 2016). Pregnancy is associated with metabolic changes in mother. This causes drastic changes in maternal physiological, biological and hematological parameters. These changes are reversible, if there is no complications (Cunningham, 2005).

Towards third trimester, the glucose utilized by the fetus increases upto 33 mmol/kg/min (Sivan, 1999). This increases the demand of energy in growing fetus, which in tern increases the insulin resistance. In addition to this increase in the level of oestrogen, progestron, human plancental lactogen (hpl), human placental growth hormone (hPGN), cortisol, TNF alpha, ILs etc (Ryan,1988; wada, 2010; Gonzalez, 2000; Barbour, 2001; Kirwan, 2002) is responsible for insulin resistance, which is associated with development of dyslipidemia in the form of increased level of serum triglycerides, total cholesterol and low density lipoprotein, where as ther is a reduction in high density lipoprotein (Kawamoto, 2011; Steinberger, 1995). Alteration in lipid profiles leads to maternal complications, such as gestational hypertension, pre-eclampsia and intra hepatic cholestasis. Fetal complications, such as intra-uterine growth retardation, pre-term birth and macrosomia. These factors in later part of life, may develop diabetes mellitus, hypertension, cardio-vascular complications and atherosclerosis (Nascimento, 2016; Jin wy, 2016).

Body's biochemical dysregulation during pregnancy may lead to anxiety, which increases blood

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pressure and uterine artery resistance, which results in fetal distress, if this issue is not addressed, it may cause maternal and fetal death (Dipietro et al., 2002).

There are very less number of literatures on prenatal depression, than that of postnatal depression. Pre-natal depression has a negative influence on physical and mental health of both mother and fetus (Glover et al, 1997). Some of the major complications of prenatal depression were associated with lower birth weight of babies, elevated resting heart rate, increased risk of developmental delay, pre-term babies, increased physiological reactivity, behavior problems in childhood and adolescence, than that of the children of non-depressed mothers (Bruijin et al, 2009). Prenatal depression will be a strong risk factor for developing post-natal depression. Traditional method of treating prenatal depression with anti-depressants was considered to increase the risk of postpartum hemorrhage and affects the unborn child too (Kieler et al, 2012).

Psychotherapy, complementary and alternative medicines were considered safe and effective, has been used extensively for the treatment option for antenatal depression (Cohen et al, 2006). Indian methods of treating antenatal depression with ethical disciplines, physical postures and spiritual practices in tern contribute to deep relaxation in which the body and mind experience deep sense of calmness (Alwan et al, 2011). Another meta-analysis focused on exercise for antenatal depression and a significant reduction in depression scores (SMD- 0.46,95% CI- 0.87 to 0.05. p=0.03.I^2 =68%) for exercise intervention relative to the comparison group (Daley, 2015).

Integrated yogic programs may be an effective treatment option in alleviating antenatal depression, with the study results shows that the intervention group showed significant improvement in reduction of antenatal depression compared to control group (Satyapriya et al)

The health status of women during pregnancy is directly proportional to the health of Newborn babies. Having healthy food during pregnancy and regular exercise for an hour a day for five to six days a week will reduce the risk and complications during pregnancy, which in turn improve the success rate of healthy babies. This helps to increase the blood supply to mother and fetus, reduces the level of stress, improve the mood and energy level. Improve the quality of sleep. Mother's nutritional status during pregnancy plays a vital role on various aspects of the fetus, which includes brain development, improvement in cognitive and thinking ability of fetus. The intelligence level of the fetus and social adjustment in the later part of life is also very much depends on the nutritional and psychological status of the mother during pregnancy. Hence it is very much important to focus on balanced diet during pregnancy in order to improve the labor and delivery Apart from above-mentioned benefits.

Objectives of the Study

1. This study would help to find out the effects of yogic practices with and without diet modification on blood lipid profile among pregnant women.
2. This study would help to find out the effects of yogic practices with and without diet modification on anxiety among pregnant women.

Statement of the Problem

Maternal mortality rate is increasing day by day at an alarming rate. Death during pregnancy has been raised up to 830 per day. We need to find out some solution to overcome this situation mostly in the developing countries (www.unicef.com). Women from low socioeconomic status and from rural areas need extra care during their emergency period. Proper care should be given at the time of conception, during the entire course of pregnancy and also after their deliveries in order to protect the mother and Newborn babies (sciencedaily, 2002)

Hypotheses

1. It was hypothesized that there would be a significant difference in blood lipid profile (Triglycerides, HDL, LDL) of pregnant women due to yogic practices with and without diet modification than the control group.
2. It was hypothesized that there would be a significant difference in anxiety of pregnant women due to yogic practices with and without diet modification than the control group.

Methodology

The purpose of the present study is to analyze the outcome of yogic practices with and without diet modification on lipid profiles (Triglycerides, HDL, LDL) and anxiety among pregnant women. To achieve the purpose of the study, sixty pregnant women who were pregnant for the first time from various maternity clinic in and around Chennai city were randomly selected. The age group of the subjects ranged from 21 to 28 years. The investigator selected the independent variables namely yogic practices with and without diet modification for the analysis. The dependent variables selected for this study was lipid profiles (Triglycerides, HDL, LDL) and anxiety. The pre-test and post-test random group design were used as an experimental design, in which sixty pregnant women were divided into three groups of twenty subjects in each group. Group I yogic practices with diet modification, Group II yogic practices without diet modification and Group III acted as a control group. The subjects were tested on the selected criterion variables before and after the training program. The data collected from the three groups before and after the training program on the selected criterion variables were statistically analyzed with analysis of covariance (ANCOVA), whenever the 'F' – ratio for adjusted posttest means were found to be significant, Schaffer's test was followed by a post hoc test to

determine which of the paired mean differences were significant. In all the cases 0.05 level of significance was fixed at level of confidence to test the hypothesis (Clarke 1972)

Table 1
Analysis of covariance for the pre, post and adjusted post test on triglycerides of experimental group I, II and control group (Total Scores in mg/dl)

TEST	EG I	EG II	CG	SV	SS	DF	MS	F
PRE-TEST	194.65	199.75	98.45	BG	280.93	2	140.46	0.20
				WG	38301.25	57	671.95	
POST TEST	173.5	206.8	204.6	BG	13872.93	2	6936.46	12.46*
				WG	31709	57	556.29	
ADJUSTED POST - TEST	175.67	205.23	203.23	BG	11103.76	2	5551.88	27.91*
				WG	11138.54	56	198.90	
Mean gain	21.15	7.05	6.15					

*Significant at 0.05 level of confidence.

The Table 1 shows that the pre-test mean values on triglycerides of experimental group I, experimental group II and control groups were 194.65, 199.75 & 198.45 respectively. The obtained 'F' ratio 0.209043 for the pre-test score was lesser than the table value 3.22 for 2 and 57 degrees of freedom at 0.05 level of confidence on Triglycerides. There is no significant difference between the experimental and control groups on triglycerides. The post-test mean values on triglycerides of experimental group I, experimental group II and control groups were 173.5, 206.8 & 204.6 respectively. The obtained 'F' ratio 12.46897 for post-test scores was greater than the table value 3.22 for the degree of freedom 2 and 57 required significance at 0.05 level of confidence on triglycerides. The adjusted post-test means on triglycerides of experimental group I, experimental group II and control groups were 175.67, 205.23 & 203.23 respectively. The obtained 'F' ratio of 27.91257 for adjusted post-test means was greater than the table value of 3.23 for the degree of freedom 2 and 56 required for significance at 0.05 level of confidence on triglycerides. Since the obtained 'F' ratio was significant, in order to find out the paired mean difference, the Scheffe's test was employed.

Table 2
Scheffe's post hoc test on triglycerides of experimental group I, II and control group

EG I	EG II	CG	MD	CI
175.67	205.23	-	29.56*	1.16
175.67	-	203.98	28.31*	1.16
-	205.23	203.98	1.25*	1.16

The Table 2 shows that the Scheffe's post – Hoc method of testing the significance of the difference between the paired means the following analysis of covariance for the experimental group I, experimental group II and control group was done. The mean differences between the experimental group I, experimental group II is 29.56 which is significant at 0.05 level of the confidence interval. The mean differences between the experimental group I and control group is 28.31 which is significant at 0.05 level of the confidence interval. The comparison between experimental group II and control group is 1.25 the

mean difference is significant at 0.05 level of the confidence interval. This indicates that the triglycerides was significantly lowered in both the experimental groups than the control group. There is a significant difference between experimental group I and experimental group II, but when comparing the mean difference the experimental group I is more effective in reducing triglycerides compared to experimental group II.

Table 3
Analysis of covariance for the pre, post and adjusted post test on high density lipoprotein (hdl) of experimental group I, II and control group (Total Scores in mg/dl)

TEST	EG I	EG II	CG	SV	SS	DF	MS	F
PRE-TEST	39.95	38.9	38.35	BG	56.43	**2**	13.21	0.92
				WG	813.3	**57**	14.26	
POST TEST	42.7	38.7	37.3	BG	314.13	**2**	157.06	14.28*
				WG	626.6	**57**	10.99	
ADJUSTED POST -TEST	42.02	38.82	37.83	BG	187.41	**2**	93.70	30.23*
				WG	173.57	**56**	3.09	
Mean Gain	2.75	0.2	1.05					

*Significant at 0.05 level of confidence.

The Table 3 shows that the pre-test mean values on high density lipoprotein of experimental group I, experimental group II and control groups were 39.95, 38.9 & 38.35 respectively. The obtained 'F' ratio 0.926288 for the pre-test score was lesser than the table value 3.22 for 2 and 57 degrees of freedom at 0.05 level of confidence on high density lipoprotein. There is no significant difference between the experimental and control groups on high density lipoprotein. The post-test mean values on high density lipoprotein of experimental group I, experimental group II and control groups were 42.7, 38.7 & 37.3 respectively. The obtained 'F' ratio 14.2879 for post-test scores was greater than the table value 3.22 for the degree of freedom 2 and 57 required significance at 0.05 level of confidence on high density lipoprotein. The adjusted post-test means on high density lipoprotein of experimental group I, experimental group II and control groups were 42.02, 38.82 & 37.83 respectively. The obtained 'F' ratio of 30.23375 for adjusted post-test means was greater than the table value of 3.23 for the degree of freedom 2 and 56 required for significance at 0.05 level of confidence on high density lipoprotein. Since the obtained 'F' ratio was significant, in order to find out the paired mean difference, the Scheffe's test was employed.

Table 4
Scheffe's post hoc test on high density lipoprotein of experimental group I, II and control group

EG I	EG II	CG	MD	CI
42.04	38.82	-	3.22*	0.31
42.04	-	37.83	4.21*	0.31
-	38.82	37.83	0.99*	0.31

The Table 4 shows that the Scheffe's post – Hoc method of testing the significance of the difference between the paired means the following analysis of covariance for the experimental group I, experimental group II and control group was done. The mean differences between the experimental group I, experimental group II is 3.22 which is significant at 0.05 level of the confidence interval. The mean differences between the experimental group I and control group is 4.21 which is significant at 0.05 level of the confidence interval. The comparison between experimental group II and control group is 0.99 the mean difference is significant at 0.05 level of the confidence interval. This indicates that the high density lipoprotein was significantly increased in both the experimental groups than the control group. There is a significant difference between experimental group I and experimental group II, but when comparing the mean difference the experimental group I is more effective in increasing high density lipoprotein compared to experimental group II.

Table 5

Analysis of covariance for the pre, post and adjusted post test on low density lipoprotein (ldl) of experimental Group I, II and control group (Total Scores in mg/dl)

TEST	EG I	EG II	CG	SV	SS	DF	MS	F
PRE-TEST	101.15	101.65	105.81	BG	260.63	2	130.31	1.32
				WG	5604.3	57	98.32	
POST TEST	101.85	117.65	129.7	BG	7803.1	2	3901.55	29.17*
				WG	7623.3	57	133.74	
ADJUSTED POST -TEST	103.05	118.50	127.64	BG	5982.8	2	2991.44	34.47*
				WG	4859.25	56	86.77	
Mean Gain	0.7	16	23.89					

*Significant at 0.05 level of confidence.

The Table 5 shows that the pre-test mean values on low density lipoprotein of experimental group I, experimental group II and control groups were 101.15, 101.65 & 105.8 respectively. The obtained 'F' ratio 1.32542 for the pre-test score was lesser than the table value 3.22 for 2 and 57 degrees of freedom at 0.05 level of confidence on low density lipoprotein. There is no significant difference between the experimental and control groups on low density lipoprotein. The post-test mean values on low density lipoprotein of experimental group I, experimental group II and control groups were101.85, 117.65 & 129.7 respectively. The obtained 'F' ratio 29.17279 for post-test scores was greater than the table value 3.22 for the degree of freedom 2 and 57 required significance at 0.05 level of confidence on low density lipoprotein. The adjusted post-test means on low density lipoprotein of experimental group I, experimental group II and control groups were103.05, 118.50 & 127.64 respectively. The obtained 'F' ratio of 34.47462 for adjusted post-test means was greater than the table value of 3.23 for the degree of freedom 2 and 56 required for significance at 0.05 level of confidence on low density lipoprotein. Since the obtained 'F' ratio was significant, in order to find out the paired mean difference, the Scheffe's test was employed.

Table 6
Scheffe's post hoc test on low density lipoprotein of experimental group I, II and control group

EG I	EG II	CG	MD	CI
103.05	118.50	-	15.45*	1.19
103.05	-	127.64	24.59*	1.19
-	118.50	127.64	9.14*	1.19

The Table VI shows that the Scheffe's post – Hoc method of testing the significance of the difference between the paired means the following analysis of covariance for the experimental group I, experimental group II and control group was done. The mean differences between the experimental group I, experimental group II is 15.45 which is significant at 0.05 level of the confidence interval. The mean differences between the experimental group I and control group is 24.59 which is significant at 0.05 level of the confidence interval. The comparison between experimental group II and control group is 9.14 the mean difference is significant at 0.05 level of the confidence interval. This indicates that the low density lipoprotein was significantly reduced in both the experimental groups than the control group. There is a significant difference between experimental group I and experimental group II, but when comparing the mean difference the experimental group I is more effective in reducing low density lipoprotein compared to experimental group II.

Table 7
Analysis of covariance for the pre, post and adjusted post test on anxiety of experimental group i, ii and control group (Total in Scores)

TEST	EG I	EG II	CG	SV	SS	DF	MS	F
PRE-TEST	45.35	48.31	48.21	BG	112.23	2	56.11	0.41
				WG	7721.95	57	135.47	
POST TEST	32.61	42.51	55.75	BG	5396.63	2	2698.31	28.21*
				WG	5451.55	57	95.64	
ADJUSTED POST -TEST	33.79	41.87	55.18	BG	4625.94	2	2312.97	51.88*
				WG	2496.64	56	44.58	
Mean Gain	12.74	5.8	7.54					

*Significant at 0.05 level of confidence.

The Table 7 shows that the pre-test mean values on anxiety of experimental group I, experimental group II and control groups were 45.35, 48.3 & 48.2 respectively. The obtained 'F' ratio 0.414228 for the pre-test score was lesser than the table value 3.22 for 2 and 57 degrees of freedom at 0.05 level of confidence on anxiety. There is no significant difference between the experimental and control groups on anxiety. The post-test mean values on anxiety of experimental group I, experimental group II and control groups were 32.6, 42.5 & 55.75 respectively. The obtained 'F' ratio 28.2129 for post-test scores was greater than the table value 3.22 for the degree of freedom 2 and 57 required significance at 0.05 level of confidence on anxiety. The adjusted post-test means on anxiety of experimental group I, experimental group II and control groups were 33.79,

41.87 & 55.18 respectively. The obtained 'F' ratio of 51.8807 for adjusted post-test means was greater than the table value of 3.23 for the degree of freedom 2 and 56 required for significance at 0.05 level of confidence on anxiety. Since the obtained 'F' ratio was significant, in order to find out the paired mean difference, the Scheffe's test was employed.

Table 8
Scheffe's post hoc test on anxiety level of experimental group I, II and control group

EG I	EG II	CG	MD	CI
33.79	41.87	-	8.08*	0.86
33.79	-	55.18	21.39*	0.86
-	41.87	55.18	13.31*	0.86

The Table 8 shows that the Scheffe's post – Hoc method of testing the significance of the difference between the paired means the following analysis of covariance for the experimental group I, experimental group II and control group was done. The mean differences between the experimental group I, experimental group II is 8.08 which is significant at 0.05 level of the confidence interval. The mean differences between the experimental group I and control group is 21.39 which is significant at 0.05 level of the confidence interval. The comparison between experimental group II and control group is 13.31 the mean difference is significant at 0.05 level of the confidence interval. This indicates that the anxiety was significantly reduced in both the experimental groups than the control group. There is a significant difference between experimental group I and experimental group II, but when comparing the mean difference the experimental group I is more effective in reducing the anxiety compared to experimental group II.

Conclusion

The results of the study indicated that the experimental groups I and II namely yogic practices with and without diet modification had significantly influenced by the selected variables such as blood lipid profile and anxiety, as both experimental groups had undergone systematic training over twelve weeks duration. At the same time when the two experimental groups were compared, yogic practices with diet modification group showed significant reduction in triglycerides, low density lipoprotein and anxiety than the yogic practices without diet modification group. And significant improvement in high density lipoprotein of experimental group with diet modification, than the experimental group without diet modification. The control group did not show significant difference in the selected variables as they did not undergo yogic training or diet consultation similar to that of experimental groups. So, the training impact of twelve-week yogic practices with diet modification was much greater than that of yogic practices without diet modification among pregnant women. The same method of training may recommend for a first and third trimester of pregnancy to improve the physical and physiological variables. This study would help to enhance the overall health and well-being of mother and fetus.

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