



## Research Article

www.ijrap.net



### EFFECTIVENESS OF SELECTED MIND BODY INTERVENTIONS ON CORTISOL LEVEL AMONG ANTENATAL WOMEN WITH ANXIETY RELATED TO CHILDBIRTH

A.Jebarna Kiruba Mary <sup>1\*</sup>, Fathima Latheef <sup>2</sup>, S.J.Nalini <sup>3</sup>

<sup>1</sup>Scholar, Saveetha University, Chennai, India

<sup>2</sup>Principal, Columbia College of Nursing, Bangalore, India

<sup>3</sup>Professor cum Vice Principal, Faculty of Nursing, Sri Ramachandra University, Porur, Chennai, India

Received on: 25/04/17 Accepted on: 09/06/17

**\*Corresponding author**

E-mail: jebamugeash@gmail.com

DOI: 10.7897/2277-4343.083154

#### ABSTRACT

Anxiety is prevalent during pregnancy, which have an adverse impact on the fetus and neonate. During anxiety stress hormone triggers the release of glucocorticoid stress hormones, cortisol. Cortisol is secreted in higher levels during the body's stress response and is responsible for several stress-related changes in the body. Mind body interventions are an effective and simple method to reduce the cortisol secretion. The aim of this study was to assess the effectiveness of selected mind body interventions on cortisol level among antenatal women with anxiety on childbirth. Participants were 30 primi antenatal women (15 experimental and 15 control groups) at 32-33 weeks of gestation. In pretest cortisol level was checked for both groups. On the day of pretest selected mind body interventions were demonstrated to participants of experimental group but control group received only standard hospital routine care. After 4 weeks of intervention i.e. at 36-37 weeks of gestation cortisol level was checked for both groups. There was a significant difference in mean scores of cortisol level between control and experimental groups and there was also a significant difference between the pre and post tests of experimental group ( $p < 0.001$ ). The results of the study showed that the selected mind body interventions reduce the cortisol level among antenatal women with anxiety related to childbirth.

**Key words:** Antenatal women, anxiety, childbirth, cortisol, mind body interventions

#### INTRODUCTION

Pregnancy period is one of the wonderful phases of a woman's life. Pregnant women will face a lot of emotional issues, mainly due to hormonal changes. This will result in unusual mood swings<sup>1</sup>. Childbirth is one of the most marvelous and memorable segment in a woman's life. The fear and anxiety about childbirth often prevents most women from enjoying this experience<sup>2</sup>. Fear of childbirth is an anxiety disorder which may manifest itself in nightmares, difficulties in concentrating on work or, physical complaints, and often in an increased request for a cesarean section as the mode of delivery<sup>3</sup>. Childbirth fear is more common in primigravid women than multiparous women<sup>4</sup>. Prevalence of anxiety disorder during pregnancy, in developed and developing countries are 10% and 25% respectively. High levels of anxiety, during pregnancy, have an adverse effect on mother and baby. Anxiety, in early pregnancy, results in loss of fetus, decrease in birth weight and increased activity of the Hypothalamus – Hypophysis–Adrenal axis<sup>5</sup>. Mother's anxiety, during pregnancy, is also associated with poor maternal- child interaction<sup>6</sup>. Moderate-to-severe anxiety, during pregnancy, has a significant effect on children's psychiatric disorders, which are, sometimes, stable and seriously endanger the health of children<sup>7</sup>. Fear, stress and anxiety all have marked effects on labour progression and pain perception. When a mother has stress and anxiety during her pregnancy, especially in the last trimester leads to an increased chance of prolonged duration of active labour, greater use of pain relief, higher rate of emergency caesarean sections, more negative personal experiences<sup>8</sup>. Animal and human studies support that maternal stress and anxiety during pregnancy will have both immediate and long-term effects on her offspring. This results in the secretion of cortisol, into the bloodstream. During stress, cortisol

triggers the "flight or fight" response of an individual. Prenatal maternal stress leads to an increased secretion in the cortisol level which has a direct effect on the fetus. There is a relationship between maternal and fetal cortisol levels. Even if there is a little increase in the level of maternal cortisol will equal to large increases in fetal cortisol level<sup>9</sup>. Stress during pregnancy will influence the developing structures of the fetus and will determine the physical, cognitive or behavioural outcome<sup>10</sup>. During prenatal period the strength of effect from stress was stronger at 32 weeks of gestation than 18 weeks of gestation which results in hyperactivity, emotional and conduct disorders in double the level for the child<sup>11</sup>. Altered brain structure and its function are associated with prenatal stress<sup>12</sup>. It has been found that changes in brain development will leads to changes in the child's fingerprint pattern<sup>13</sup>.

Mind body medicine will influence one's own health by using the inner power of thoughts and emotions. As Hippocrates wrote, "The natural healing force within each one of us is the greatest force in getting well". Mind-body interventions are pseudo medical interventions based on the concept of mind influences the physical body. Common mind-body techniques to foster mind-body processes are relaxation, hypnosis, visual imagery, meditation, yoga, positive affirmation, biofeedback, tai chi, qi gong, cognitive-behavioral therapies, group support, autogenic training and spirituality<sup>14</sup>.

#### MATERIALS AND METHODS

**Objective:** (i) To evaluate the effectiveness of selected mind body interventions on serum cortisol among antenatal women between control and experimental groups.

**Hypotheses:** There will be a significant difference in cortisol level among antenatal women between control and experimental groups

**Research approach:** An experimental Quantitative approach was used

**Design:** True experimental design - pretest post test with control group design was adopted for this study

**Study setting:** Study was conducted at selected Hospitals, Bengaluru

**Sampling technique:** Simple random sampling technique was used to select the samples.

**Sample Size:** 30 Antenatal women who fulfilled the inclusion criteria were randomly selected in each group. (Control group = 15, Experimental group= 15)

**Inclusion criteria**

- Primi singleton normal pregnancy who were mentally, physically healthy at 32-33 weeks of gestation and categorised as low risk pregnant women as per the national standard
- Antenatal women those who were attending regular antenatal checkup on study settings without prior experience of practicing mind body interventions were included.

**Exclusion criteria**

- High risk pregnancies like maternal age below 20 or above 35, twins or triplets, bad obstetrics history, anemia (<10 grams/dl), chronic renal, hepatic, or heart disease, seizure disorders, and structural abnormalities in the reproductive system
- Non-attendance at training sessions, no exercise at home and getting into major psychological problems were excluded from study.

**Ethical consideration**

The study was initiated after getting permission from

- Institutional Human Ethics Committee of Saveetha University (010/01/2015/IEC/SU; dated on 20-01-2015).
- Authorities of selected Hospitals, Bengaluru.
- Informed consent from the participants.

**Method of data Collection:** Pretest data collection: After allocation of participants in the control and experimental groups, demographic variables were collected by using semi structured

interview schedule and their anxiety level were assessed by using the standard tool like Wijma delivery expectancy/experience questionnaire (W-DEQ-version A) and Beck anxiety inventory (BAI). Serum cortisol level was analyzed by bidirectional interfaced chemi luminescent immuno assay.

**Intervention:** On the day of pretest, selected mind body interventions (simple breathing for relaxation, meditation with gyan mudra, yogic breathing including nadi shodhana pranayama, bhramari pranayama, active visualization with birth affirmations and modified shavasana.) were demonstrated to the participants. Participants were practiced these interventions for 45minutes two times (morning and evening) a day for 4 weeks. Supervision was made every alternate day. To ensure compliance with the research protocol telephone calls were made to the participants. Participants in the control group received only the standard routine hospital care. Selected mind body interventions were not practiced by the control group. Post test data collection was conducted at 36-37 weeks of gestation (4<sup>th</sup> week after pretest) for both the groups by using the same tools.

**Statistical Analysis**

Descriptive statistics were used for all variables to know the percentage. Parametric tests (Paired ‘t’ test, Independent t-test) were used for the comparison of means between control and experimental groups. A probability of 0.05 or less was taken as statistically significant. The analysis and plotting of graphs were carried out using Sigmaplot 13 (Systat Software Inc. USA)

**RESULTS**

**Description of mothers according to their demographic variables**

With regard to the age majority of control group (60%), experimental group (67%) belongs to the age group of 24 to 29 years. Regarding religion, most of them were Hindu in both groups. Regarding the educational status 22% participants from experimental group had completed the post graduate education and 38% participants had completed the high school education. With regard to the place of residence 40% of control group and 53% of experimental group were from suburban. With regard to occupational status of the antenatal women in experimental group, 40% of participants were semiskilled worker and skilled worker respectively. In control group 60% of the primi antenatal women were from nuclear family and 73% of participants were from joint family in the experimental group. No participants of both groups had family history of mental illness and diagnosed as a case of mental illness.

**Effectiveness of selected mind body interventions on serum cortisol**

**Table 1: Effectiveness of selected mind body interventions on serum cortisol by using parametric tests**

Group	Mean±SE	Significant for paired ‘t’-test and Unpaired ‘t’-test			
		Con- pre test -post test	Exp- pre - post test	Con -pre exp- pre test	Con post test- Exp post test
Control pre test	22.68±1.05	t=1.22 p=0.241		t=0.251 p=0.804	t=2.958 p=0.006
Control post	23.03±0.97				
Experimental pre test	23.11±1.33		t=6.59 p<0.001		
Experimental post test	18.85±1.03				

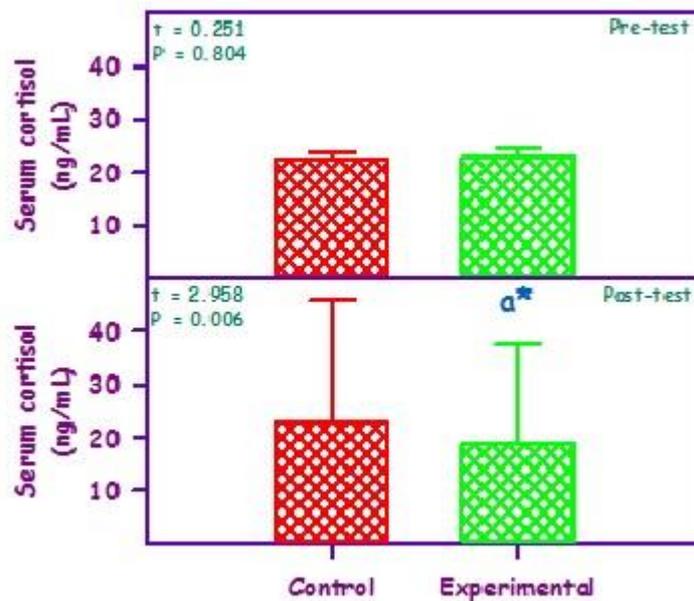


Figure 1

Figure 1 shows the serum cortisol level in pretest and post test of control and experimental groups.  $a$ =statistically significant between pre test and post test of experimental group and  $*$ =statistically significant of post test between experimental and control groups.

Table 1 shows the effectiveness of selected mind body interventions on serum cortisol by using paired 't' test and unpaired 't' test (parametric test). The mean  $\pm$  SE of serum cortisol of control group and experimental group were given. The mean values of control group pre test and post test were 22.68, 23.03. The experimental group of mean values for pre test and post test were 23.11, 18.85 respectively. Paired t test shows the statistical significant between pretest and post test of experimental group ( $t = 6.59$ ,  $p < 0.001$ ). Unpaired t test shows that there was also a statistical significant difference between post tests of control and experimental groups ( $t = 2.958$ ,  $p = 0.006$ ). The findings proved that, the selected mind body intervention has significantly decreased the serum cortisol level.

## DISCUSSION

The study was consistent with the following findings: Jacobs, Saron and their colleagues used a questionnaire to measure aspects of mindfulness among a group of volunteers before and after an intensive, three-month meditation retreat. They also measured cortisol levels in the participant's saliva. Participants were trained attention skills as mindfulness of breathing, observing mental events and observing the nature of consciousness. Participants also practiced cultivating benevolent mental states, including loving kindness, compassion, empathic joy and equanimity. They found that there was a correlation between a high score for mindfulness and a low score in cortisol both before and after the retreat. Individuals whose mindfulness score increased after the retreat showed a decrease in cortisol<sup>15</sup>. The study was conducted to assess the effects of

prenatal Hatha yoga on cortisol, affect and depressive symptoms among 51 women. Tools were used twice (before and after a 90-min prenatal Hatha yoga session) to assess the level of salivary cortisol, affect and symptoms of depression. Yoga group

participants showed less ante partum and postpartum ( $p < .05$ ) symptoms of depression than control group participants. Findings indicate that prenatal Hatha yoga provides a positive affect during pregnancy, decrease in the level of cortisol and improved maternal postpartum well-being<sup>16</sup>. The study was conducted to determine the effects of IBMT on basal cortisol level among the college students. Selected 34 participants were randomly selected into two groups that is integrative body-mind training (IBMT Meditation-experimental group) and relaxation training (control) group. Duration of intervention was about 4 weeks. Participants were compared with a control group. The results showed that basal cortisol level was decreased significantly in the IBMT group but not in relaxation group even after 2 and 4 weeks of training<sup>17</sup>. Thirthalli et.al conducted a study to assess the role of yoga as an antidepressant and its effect on serum cortisol level. Sample size were 54 divided into 3 groups like antidepressant medication alone ( $n = 16$ ), yoga-alone ( $n = 19$ ) or a combination of both ( $n = 19$ ). Yoga was taught for a month and participants were practiced at home daily. Hamilton Depression Rating Scale (HDRS) and serum cortisol level were used to assess the data. The findings of the study proved that yoga has an effect of antidepressant and reduction in the level of cortisol<sup>18</sup>.

## CONCLUSION

The present study focus on the selected mind body interventions on cortisol level among antenatal women with anxiety related to childbirth. The finding of the study shows that the selected mind body interventions were found effective in reducing the level of cortisol among antenatal women with childbirth anxiety. Nurses and midwives should teach and demonstrate the mind body interventions to antenatal women who has anxiety related to

childbirth in all community centers, antenatal clinics etc. Mind body interventions are complimentary medicinal practices which are practiced to use the mind to promote overall health and well being

#### ACKNOWLEDGEMENT

The researcher acknowledges the cooperation of participants and Hospital authorities to carry out the study.

#### REFERENCES

1. Asha Das (2016). Pregnant women want their partners to know. [Internet] [cited 2017 January 28]. Available from <http://www.boldsky.com/pregnancy-parenting/basics/2016/things-pregnant-women-want-their-partners-to-know-109220.html>
2. Vivekanand (2016). Labor and delivery. [Internet] [cited 2017 January 30] Available from <http://www.medindia.net/patients/patientinfo/labor.htm>
3. Wijma, K., &Wijma,B. (2016, in press). A woman afraid to deliver -how to manage childbirth anxiety. In K.M. Paarlberg &H.B.M. van de Wiel (Eds.), Biopsychosocial obstetrics and gynaecology. Berlin: Springer
4. Hofberg KM, Brockington IF(2001). Tokophobia: A morbid dread of childbirth. *J Psychosom Obstet Gynaecol.* 22:96
5. Glover V. Maternal depression, anxiety and stress during pregnancy and child outcome; what needs to be done. *Best practice & research Clinical obstetrics & gynaecology* 2014; 28(1): 25-35
6. Braeken MAK, Kemp AH, Outhred T, Otte RA, Monsieur GJ, Jones A, et al. Pregnant mothers with resolved anxiety disorders and their offspring have reduced heart rate variability: Implications for the health of children. *PLoS one.* 2013;8(12) .
7. Teyhan A, Galobardes B, Henderson J. Child allergic symptoms and mental well-being: the role of maternal anxiety and depression. *The Journal of pediatrics.* 2014;165(3):592–9.
8. T. Saisto and E. Halmesmäki, "Fear of childbirth: a neglected dilemma," *Acta Obstetrica et Gynecologica Scandinavica*, vol. 82, no. 3, 2003,pp. 201–208.
9. Bergman K, Sarkar P, O'Connor TG, Modi N, Glover V. Maternal stress during pregnancy predicts cognitive ability and fearfulness in infancy. *Journal of the American Academy of Child and Adolescent Psychiatry* 2007; 46(11):1454–1463.
10. Brouwers E, van Baar A, Pop V. Maternal anxiety during pregnancy and subsequent infant development. *Infant Behavior and Development* 2001; 24(1):95–106.
11. Vivette Glover. ,The Effects of Maternal Anxiety or Stress During Pregnancy on The Fetus and The Long-Term Development of The Child. *Nutrition and Health* 2007;19:1-2
12. Mennes M, Van den Bergh B, Lagae L, Stiers P. Developmental brain alterations in 17 year old boys are related to antenatal maternal anxiety. *Clinical Neurophysiology* 2009;120(6):1116-22.
13. King S, Mancini-Marie A, Brunet A, Walker E, Meaney MJ, Laplante DP. Prenatal maternal stress from a natural disaster predicts dermatoglyphic asymmetry in humans. *Development Psychopathology*2009;21(2):343-53.
14. Steven D. Ehrlich, Mind body Medicine,2011[Internet] [cited 2016 January 28] Available from <https://umm.edu/health/medical/altmed/treatment/mindbody-medicine>
15. Tonya L. Jacobs, Phillip R. Shaver, Elissa S. Epel, Anthony P. Zanesco, Stephen R. Aichele, David A. Bridwell, Erika L. Rosenberg, Brandon G. King, Katherine A. MacLean, Baljinder K. Sahdra, Margaret E. Kemeny, Emilio Ferrer, B. Alan Wallace, Clifford D. Saron. Self-Reported Mindfulness and Cortisol During a Shamatha Meditation Retreat.. *Health Psychology*, 2013.
16. Bershadsky S, Trumppheller L, Kimble HB, Pipaloff D, Yim IS. The effect of prenatal Hatha yoga on affect, cortisol and depressive symptoms. *Complement Ther Clin Pract* 2014 May; 20(2):106-13
17. Yaxin Fan, Yi-Yuan Tang, Michael I. Posner. Cortisol Level Modulated by Integrative Meditation in a Dose-dependent Fashion. *Stress and Health* 2014;30(1) Available from: <https://www.researchgate.net/publication/236930056>
18. J Thirthalli, GH Naveen, MG Rao, S Varambally, R Christopher, BN Gangadhar. Cortisol and antidepressant effects of yoga. *Indian journal of Psychiatry* 2013;55(7):405-408

#### Cite this article as:

A.Jebarna Kiruba Mary *et al.* Effectiveness of selected mind body interventions on cortisol level among antenatal women with anxiety related to childbirth. *Int. J. Res. Ayurveda Pharm.* 2017;8(3):109-112 <http://dx.doi.org/10.7897/2277-4343.083154>

Source of support: Nil, Conflict of interest: None Declared

Disclaimer: IJRAP is solely owned by Moksha Publishing House - A non-profit publishing house, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJRAP cannot accept any responsibility or liability for the site content and articles published. The views expressed in articles by our contributing authors are not necessarily those of IJRAP editor or editorial board members.