IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 6, Issue 6 Ver. I. (Nov.- Dec .2017), PP 39-42
www.iosrjournals.org

Efficacy of Yoga Practices in Increasing Breathing Span in Pregnant Women

Aruna Gupta[*]Nagesh Janu[1],Rina Poonia[2]
Department of Physical Education, JECRC University[1], ManipalUniversity[2]Jaipur-303905, India

Abstract: *progressive uterine distention during pregnancy causes elevation of diaphragm, changes in the lung volume, chest wall, and alter thoracic configuration. Increased end expiratory abdominal pressure results in displacing the diaphragm upwards. These changes lead to the shortened breathing span in gravid females. The present study has attempted to probe the efficacy of Yoga in increasing the span of breathing during pregnancy. The study conducted an experimental research where the subjects were matched for age, parity and financial status. All were primiparous. Reading for both the groups was taken twice – first at the time of joining and second near to the completion of the ninth month. Data was analyzed using statistical tool t-test. Results were significant.*

Keywords: *Pregnancy; breath; Third trimester breathing*

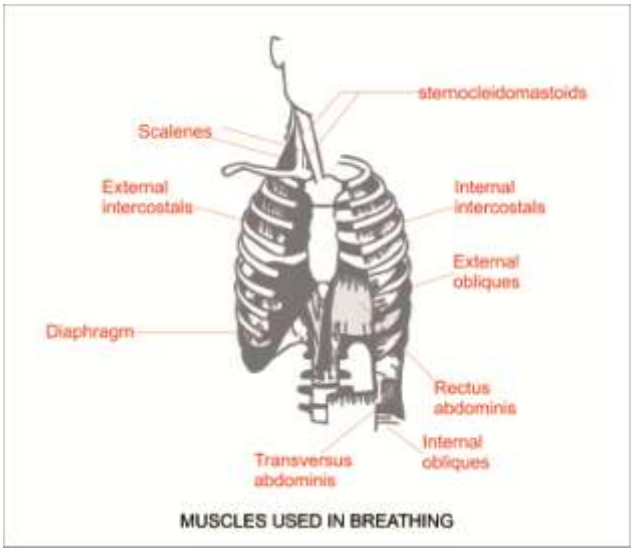
Date of Submission: 02-08-2017 Date of acceptance: 16-11-2017

I. Introduction

Motherhood is one of the greatest experiences in a woman's life. It adds poise and grace to her personality. Pregnancy being marvel of nature should sail smoothly, but physical changes that take place during this phase bring along some discomforts. As the fetus grows the uterus keeps growing in size and pushes up the diaphragm to nearly 4 centimeters [1] from its pre-pregnancy position which in turn exerts pressure on lungs. Functional residual capacity (FRC) decreases by 20% during the day time [1-3]due to elevated diaphragm. This becomes significant at night because FRC falls down naturally while sleeping. Resulting in decreased maternal oxygen and compounding the increased arterial/oxygen gradient in pregnancy [4]. Tidal ventilation may accelerate airway closure resulting in increased ventilation mismatch [5]. This effect is aggravated in supine position. Shortness of breath may lead to poor oxygenation, low energy levels and easy exhaustion. As the pregnancy advances it becomes difficult to carry out routine work, condition worsens if the woman is asthmatic which is very common in cities due to pollution. This can jeopardize oxygen supply to the growing fetus. Women of higher strata who lead a sedentary lifestyle suffer more from respiratory disturbances during pregnancy. Yogic exercises are highly beneficial during this period. *Asanas* aid to enlarge the thoracic cavity. Inversions train the lungs to bear the pressure of the abdominal organs. This prepares the pregnant woman to bear the pressure of enlarged uterus without getting exhausted[6-8].

"Breathing, process of taking air into and expelling it from the lungs, is caused by a three-dimensional changing of the shape in the thoracic and the abdominal cavities." [9]

According to this definition the breathing process is abdominal and thoracic. Diaphragm works as the principle muscle during abdominal breathing. There are other muscles which assist in the thoracic breathing process. When abdominal breathing is restricted due to some reason the accessory muscles become more active and thoracic breathing is enhanced. The various accessory muscles that participate actively during thoracic breathing are trapezius, parasternal, scalene, sternocleidomastoid, intercostal and pectoral muscles. These are voluntary muscles. In abdominal breathing the ribcage expands and contracts in the thoracic cavity with the help of intercostal muscles. During pregnancy when the abdominal breathing gets restricted by uterine distention caused by the growing fetus, accessory muscles become more active aiding enhanced thoracic breathing.During breathing lungs expand like a balloon in the thoracic cavity in three dimensions - top to bottom, side to side, and from front to back. Thus the chest cavity increases its volume. In a pregnant woman the downward expansion is restricted to a certain extent causing the lungs to expand more in the side to side and front to back directions. Various Yoga postures improve thoracic breathing by increasing the flexibility of the accessory muscles. They also help in expanding the thoracic cavity. Pranayama improves the efficiency and functioning of the accessory muscles. Hence the outcome of the yogic practices results in decrease in the shortness of breath.



II. Materials and Method

Chest expanding postures-Ardha Chandra asana ,Ustrasan, Modified Matsayasan and importantly sputa-badddhakonasana have been used during practice.
Breathing Practice- Deep breathing ,Anuloma-viloma
Inversions-Vipreet-Karni Asana, Sirsasna/headstand with support
Deep Relaxation- Yoga Nidra, Shavaasana
Om Chants- Repeated OM chants 7 or 11 times

Model used in the study

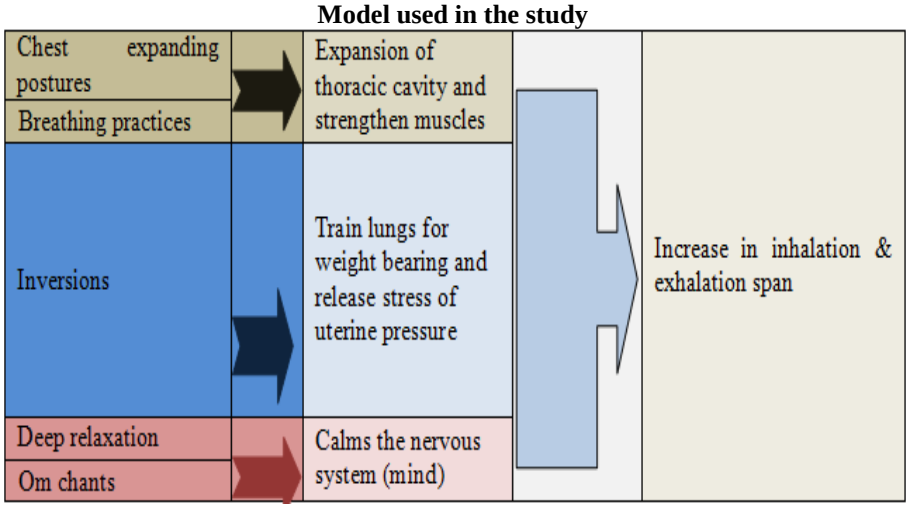


Figure 2: Design of Study Model

Design and setting
Sixty primi-gravidæ were selected by the method of randomization between their twelve to sixteen weeks of pregnancy in a prospective matched experimental study, thirty in experimental and thirty in control group.

III. Method

Subjects were matched for age, health and financial status. All were primiparous without complications of pregnancy and other serious illnesses. Control group was not given any exercise. They took up 30 minutes of walk on and off as per standard advice by the obstetrician. Experimental group attended regular yoga sessions at Studio Yogamrit, Jaipur,Rajasthan. Yoga practices included asanas, pranayama, deep relaxation, and meditation. Sessions of one hour duration were given five days a week by the researcher to maintain the quality and regularity of the practices from 12 to 14 weeks up to labour. Women were aided with props like belts, cushions, bolsters, spinal bench, bars and Swiss ball to ease them out while performing various postures. Asanas that expanded the thoracic cavity were mandatory in each session. They help in creating room for the lungs to expand during inhalation, which otherwise becomes difficult during pregnancy. Inversions were

also part of regular practice. (When body is inverted all the abdominal organs observe a healthy dislocation and exert pressure on the diaphragm which in turn does the same on lungs. It is a weight bearing exercise for the lungs that strengthens them to a great extent. This training helps them to overcome the pressure of the growing fetus and allows them to work efficiently.)Pranayama trained the lungs for slow rhythmic breathing and helped in improving their flexibility and volume of air during breathing. Deep relaxation calmed down their minds. Calm mind automatically deepens the breath increasing the breathing span. The readings were taken twice. Initial readings of inhalation/exhalation span of both the groups were taken at the beginning of the program. Second reading was taken near to the completion of gestation.

Method of measuring breathing span

The method used to measure the breath span was traditional as mentioned in the various yoga books of leading school of yoga. Accordingly the subjects were asked to sit comfortably and relax to resume normal breathing. Once the subjects were comfortable researcher gave counts per second 1,2,3,4,5 …with the help of a stopwatch to ensure the accuracy. [10].

IV. Results and Discussion

The data collected was analysedusing statistical tool t-test. The finding showed that the first reading taken of both the groups at the onset of studies had no significant difference. Second reading shows a significant difference in controlled group and experimental group.

Table: 1 Data interpretation of Inhalation –Exhalation at the beginning of the method

FIRST READING		
Inhalation	Experimental vs. control group	t-test (t=0.465, NS)
Exhalation	Experimental vs. control group	t-test (t=0.165, NS)

Table: 2 Data interpretation of Inhalation –Exhalation at the end of the method

Second Reading		
Inhalation	Experimental vs. Control Group	T-Test (T=19.912, Significant At <.01 Level)
Exhalation	Experimental vs. Control Group	T-Test (T=21.435, Significant At <.01 Level)

Table -3 Inhale first time reading Yoga group and Control group

	cat1	N	Mean	Std. Deviation	Std. Error Mean	T-test	Sig	M.D
Exp-Ist – Inhale (Ist time)	Exp	50	4.38	1.524	.216	.465	.643	.140
	Cont	50	4.52	1.488	.210			

Inhale first time reading Yoga group and Control group mean difference (m=.140)

Table -4 Exhale first time reading Yoga group and Control group

	cat1	N	Mean	Std. Deviation	Std. Error Mean	T-test	Sig	M.D
Exp-Ist Exhale (Ist time)	Exp	50	5.88	1.965	.278	1.400	.165	.540
	Cont	50	5.34	1.891	.267			

Exhale first time reading Yoga group and Control group mean difference (m=.540) and (t-test=.165, NS)

Table -5 Inhale nine months reading Yoga group and Control group

	cat1	N	Mean	Std. Deviation	Std. Error Mean	T-test	Sig	M.D
	Exp	50	8.36	1.208	.171	19.912	.000	4.520
	Cont	50	3.84	1.057	.149			

Inhale ninemonths Yoga group and Control group mean difference (m=4.520) and (t-test=19.912, Sig at <.01 level)

Table -6 Exhale nine months reading Yoga group and Control group

	cat1	N	Mean	Std. Deviation	Std. Error Mean	T-test	Sig	M.D
	Exp	50	11.20	1.525	.216	21.435	.000	7.080
	Cont	50	4.12	1.769	.250			

Exhale nine months' time reading Yoga group and Control group mean difference (m=7.080) and (t-test=21.435, Sig at <.01 level)

The data clearly shows the efficacy of Yoga in increasing the breathing span during pregnancy.

V. Conclusion

Yoga can be used as an important tool for dealing with shortness of breath during pregnancy. It can prove to be a boon for gravid women with respiratory disorders and also help females who indulge in smoking prior to or during pregnancy. Yoga intervention can help them in better elimination of toxins and prevent asthmatics to become drug dependent during pregnancy.

VI. Acknowledgement

Researcher extremely thankful for Guide and Co- Guide,JECRC University for support.

Competeing Interests

The authors declare that they have no competing interests.

References

[1]. http://www.babycentre.co.uk/a219/breathlessness-in-pregnancy
[2]. http://www.healthline.com/health/pregnancy/third-trimester-shortness-breath-edema
[3]. Munro, N.B. and Eckerman, K.F.(1998). Impacts of physiological changes during pregnancy on maternal biokineticmodeling. Radiation protection dosimetry, 79(1-4), 327-333.
[4]. Gilroy, R.J., Mangura, B.T. and Lavietes, M.H.(1988). Rib Cage and Abdominal Volume Displacements during Breathing in Pregnancy1-3. Am Rev Respir Dis, 137, 668-672.
[5]. Jensen, D., Webb, K.A., Davies, G.A. and O'donnell, D.E. (2008). Mechanical ventilatory constraints during incremental cycle exercise in human pregnancy: implications for respiratory sensation. The Journal of physiology, 586(19),4735-4750.
[6]. McAuliffe, F., Kametas, N., Costello, J., Rafferty, G.F., Greenough, A. and Nicolaides, K., (2002). Respiratory function in singleton and twin pregnancy. BJOG: An International Journal of Obstetrics &Gynaecology, 109(7), 765-769.
[7]. Kolarzyk, E., Szot, W.M. and Lyszczarz, J. (2005). Lung function and breathing regulation parameters during pregnancy. Archives of gynecology and obstetrics, 272(1), 53-58.
[8]. Weinberger, S.E., Weiss, S.T., Cohen, W.R., Weiss, J.W. and Johnson, T.S. (1980). Pregnancy and the Lung 1, 2. American Review of Respiratory Disease, 121(3), 559-581.
[9]. Kaminoff, L., 2007. Yoga Anatomy pp.7.
[10]. Swami SatyanandSaraswati, A Systematic Course in the Ancient Tantric Techniques of Yoga and Kriya, Publisher And Distributor; Yoga Publication Trust, Ganga DarshanMunger,Bihar,India,Printed at Thomson Press (India) Limited, New Delhi,110001

Aruna Gupta Efficacy of Yoga Practices in Increasing Breathing Span in Pregnant Women."IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 6, no.6 , 2017, pp. 39-42.