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Evaluation of the effect of *Yoga* and *Pranayam* on quality of ovulation in primary infertility by Color Doppler Ultrasonography

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ABSTRACT

Evaluation of quality of ovulation is possible with the help of Trans Vaginal Color Doppler Sonography. In case of primary infertility if baseline sonography findings are normal, rest of the female factors for infertility and male factors of infertility are also normal, among this couple if female partner is subjected for daily based *Yoga* and *Pranayam* programme designed by qualified *Yoga* trainer at least for six month we can evaluate the quality of ovum and ovulation. During this programme, randomly selected female patients were subjected for *Yoga* and *Pranayam* (Group-I) and similar patients were not participated for *Yoga* and *Pranayam* (Group-II). The Trans Vaginal Color Doppler findings during ovulation were compared statistically between both the groups. Six months follow up result showed that pregnancy was positive for more number of patients performing *Yoga* without ovulation inducing drugs.

Key words: *Asanas, Yoga, Pranayam, Primary Infertility, Color Doppler Ultrasonography.*

INTRODUCTION

With the help of Trans Vaginal Sonography on day 2 or 3 of the menstruation we can decide the ovarian reserve and response for follicular development, this is known as base line study of ovaries. Among the group of all primary infertility patients we subjected the patient of normally responding and reserved (normal baseline scan) findings for daily based *Yoga* and *Pranayam* programme. During the ovulation period, with the help of Trans Vaginal Color Doppler

Sonography we evaluated the quality of ovum and ovulation among all the patients performing and not performing *Yoga* and *Pranayam* and the findings were compared.

MATERIALS AND METHODS

This is prospective study of patients with primary infertility which was carried out in department of radio diagnosis, M. P. Shah Medical College and G. G. Hospital Jamnagar. Total 56 patients with primary infertility were selected. All patients had normal baseline findings on Trans vaginal sonography (TVS). Baseline scan done on day 2 or 3 of menstruation. These patients are known to have normally responding and normally reserved ovarian function. Male factors were absolutely normal for all. After primary investigations for infertility which were absolutely normal for all these patients were subjected randomly for *Yoga* and *Pranayam* with written consent (Group 1 performing *Yoga* - 29 patients and Group 2 not performing *Yoga* 27 patients). Patients were asked for no intercourse during the period of ovulation.

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Yoga and *Pranayam* was specially designed by a qualified *Yoga* trainer which cause pressure and stretching over lower abdomen for six months program. These includes daily one hour workout for all 29 patients within our hospital premises. Whole one hour was divided in four quarters where prayer was followed by first quarter which was designed for warm up exercise. Second quarter was designed for *Suryanamaskar*, third quarter was designed for various *Yoga* postures especially for lower abdominal compression and stretching. Preovulatory Trans vaginal color Doppler scans were done for all the patients for six months

Protocol for everyday practice was;

1. **Physical postures (Asanas - 1 min each):** a) Surya Namaskara (Sun Salutation) for 10 min; b) prone asanas - Cobra Pose (Bhujangasana), Locust Pose (Salabhasana), Bow Pose (Dhanurasana) ; c) standing Asanas such as Triangle Pose (Trikonasana), Twisted Angle Pose (Parsvakonasana), Spread Leg Intense Stretch (Prasarita Padottanasana); d) supine Asanas - Inverted Pose (Viparita Karni), Shoulder Stand (Sarvangasana), Plough Pose (Halasana); e) sitting Asanas - sitting forward Stretch (Paschimottanasana), fixed angle Pose (Baddhakonasana), Garland Pose (Malasana).
2. **Breathing Techniques (Pranayama – 2 min each):** Sectional Breathing (Vibhagiya - Pranayama), Forceful Exhalation (Kapala Bhati), Right Nostril Breathing (Suryanuloma Viloma) 2 min, Alternate nostril breathing (Nadisuddhi).
3. **Guided relaxation (Savasana) for 10 min**
4. **OM Meditation (OM Dhyana) for 10 min**

All the infertile female from group 1 were subjected for *Yoga* and *Pranayam*, any kind of ovulation induction drugs were not been prescribed. While female from group 2 were subjected for only preovulatory trans vaginal ultrasound scan without *Yoga* and *Pranayam* or any ovulation induction drug.

Follicular size and volume, perifollicular vascularity (RI&PSV), uterine artery RI & PI, endometrial thickness

with its morphological and functional evaluation was done by Trans vaginal ultrasonography and color Doppler for every patients during their preovulatory period till ovulation occurs. Patients were followed up every month for next 6 months after completion of the programe. Data of follicular morphology, perifollicular vascular Doppler parameter, endometrial morphology and endometrial vascular parameter by color Doppler were compared between both the groups.

Patients from both groups were ask to practice the *Yoga* and *Pranayam* at least for six months and they have to come for ultrasonography during preovulatory period (alternate day from day 8 of the menstruation till the ovulation occurs) every months. All the patients were informed regarding the time of ovulation according to ultrasonography findings and advised them for intercourse during that period. Patients were instructed to inform to sonography center if she miss the period and pregnancy were confirmed with urine pregnancy test and Trans vaginal ultrasonography.

RESULTS AND DISCUSSION

Data of follicular size and structure, perifollicular vascularity, endometrial thickness and morphology, uterine artery Doppler (RI and PI) at the time of ovulation were compared between both groups and at the end outcome of this exercise in for of pregnancy were compared in both groups.

Total no of patients 56

Group 1 - Patients performing *Yoga* and *Pranayam* - 29

Group 2 - Patients not performing *Yoga* and *Pranayam* - 27

Independent sample test: Levene's Test for Equality of Variances

Standard error of difference between two group of perifollicular artery (RI) is statstetally highly significant (t= -9.789 , p = < 0.0001) [Table 1]

Table 1: Showing statistical data

Findings		F	Sig.	t	df	Sig.(p-value) (2 tailed)
Perifollicular artery RI	Equal variances assumed	1.610	.210	-9.789	54	.0001
	Equal variances not assumed			-9.689	48.083	.0001
Perifollicular artery PSV	Equal variances assumed	7.192	.010	7.435	54	.0001
	Equal variances not assumed			7.545	48.510	.0001
Uterine artery RI	Equal variances assumed	.618	.435	-2.328	54	.024
	Equal variances not assumed			-2.340	53.753	.023
Uterine artery PI	Equal variances assumed	.002	.966	.016	54	.987
	Equal variances not assumed			.016	53.433	.987
Spiral artery RI	Equal variances assumed	2.263	.138	1.482	54	.144
	Equal variance			1.4	53.228	.142

	s not assumed			92		
Spiral artery PI	Equal variances assumed	.474	.494	.442	54	.660
	Equal variances not assumed			.440	51.908	.662
Endometrial thickness	Equal variances assumed	.050	.824	1.504	54	.138
	Equal variances not assumed			1.500	52.803	.140

Group statistic and independent sample test suggest that at the confidence of interval of 95%, here value is <0.001, so standard error of difference between two mean of perifollicular RI and two mean of perifollicular PSV is statistically significant. While value of uterine artery PI, RI as well as spiral artery PI, RI, value is >0.001, so standard error of difference between two mean of uterine artery RI,PI, spiral artery RI,PI is statistically not significant.

During six months of follow up, 23 patients conceived from group 1 while 3 patients were conceived from group 2. It suggests that *Yoga* and *Pranayam* can significantly improve the perifollicular flow in normal reserved and normally responding ovaries while it doesn't affect significantly the Doppler parameter of uterine and spiral arteries.

Possible cause of infertility in normal reserved and normally responding ovaries is poor perifollicular blood flow throughout the development of ovum which can be evaluated by color Doppler ultrasonography. Scanty perifollicular vascularity is responsible for low oxygen tension in follicle so there is reduced phasic oxygen supply to ovum and as a result the ovum which relies from ovary will be hypoxic. Even if such hypoxic ovum will fertilize, that

would be result in either pregnancy with chromosomal anomalies or recurrent abortion. In such group of patients stress and social stigma is the major cause for infertility. And as a result that will convert in to a vicious cycle of – no pregnancy → stress → hypoxic ovulation → pregnancy failure.

So the aim of this study was how to improve the perifollicular vascularity and quality of ovum without adding any ovulation inducing drugs in such group of patient. Does *Yoga* and *Pranayam* can do this? How does it help to reduce the stress and reproductive hormonal level?

Yoga is mind-body technique which involves relaxation, meditation and a set of physical exercises performed in sync with breathing.

Being holistic, it is the best means for achieving physical, mental, social and spiritual wellbeing of the practitioners.

The improvement in various parameters such as sense of wellbeing, feeling of relaxation, improved concentration, self-confidence, improved efficiency, good interpersonal relationship, increased attentiveness, lowered irritability levels, and an optimistic outlook in life were some of the beneficial effects enjoyed by the *Yoga* group as indicated by feedback score. These results point to the beneficial role of *Yoga* in not only causing reduction in basal anxiety level but also attenuating the increase in anxiety score in various stressful situations. Apparently, a decrease in anxiety scores in *Yoga* practitioners leads to their better adjustment to the environmental & internal stressors. Therefore, they are able to perform their duties with calm disposition which improves their performance. Gupta et al (2006) reported a decrease in state and trait anxiety scores in healthy subjects as well as patients after 10 days of *Yoga* based lifestyle intervention program. These observations suggest that even short term *Yoga* program can lead to reduction in stress and anxiety in the individuals.

CONCLUSION

Even though direct effect of *Yoga* and *Pranayam* on all types female infertility has not been proved but still it has proved significant role for normally reserved and normally responding ovaries. Regular practice of *Yoga* and *Pranayam* can helps to conceive without medicine in such type of infertility. Improve the flow of blood to the lower abdominal region, there by stimulating the reproductive system. More blood flow means more nutrient and oxygen supply to the reproductive organs. This way, constricted vessels are relieved, easing the flow of blood to the pelvic region.

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