

A Comparative Clinical Study of *Garbhshoshahar Yoga* with L. Arginine and Proanthocyanidin combination in *Garbhashosha* w.s.r. to Asymmetrical IntraUterine Growth Restriction

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Abstract:- IUGR is a common complication, which contributes significantly to antenatal or perinatal morbidity and mortality. The development of a fertilized ovum into a complex fully formed and healthy fetus is one of the most fascinating wonders of nature. Growth is an essential feature of life. The process of growth starts from the time of conception and continues until adulthood. The term IntraUterine Growth Restriction (IUGR) refers to a condition in which a fetus is unable to achieve its genetically determined potential size. In Ayurvedic literature, many natural formulations are barren of side effects and offer holistic care in the management of growth restriction. Hence, an effort was attempted through this text to review the Ayurvedic literature regarding Garbhashosha (IUGR) and its management.

Keywords:- Garbhashosha, Yonistrava, Abdominal girth, Ponderal index, Bleeding per vaginum, IUGR.

I. INTRODUCTION

Intrauterine growth restriction is defined as birth weight below the 10th percentile for gestational age. However, adverse outcome and mortality are seen to be increased in infants with birth weights between 10th

percentile and 15th percentile. Traditionally, population based growth curves have been used to define IUGR. Right from conception till delivery it is the mother who carries and nourishes the fetus. The fetus derives all its nourishment from the mother during this period by *Upsneha*, *Upasweda* and *Nabhi Nadi*. This can be divided in two parts:

- **Before organogenesis-** *Garbha* obtains its nutrition by *Upsneha* and *Upasweda*.
- **After organogenesis-** *Upasnehana* through *Loma Kupas* and another part through *Nabhi Nadi*.

Garbhashosha:-

Garbhashosha is derived from two words- *Garbha* and *Shosha*

***Garbha* :-** “kqØ”kksf.kr thola;ksxs rq [kyq dqf{kxrs xHkZlaKk HkofrAA ¼p- la- “kk- 4@5½

The union of *Sukra*, *Sonita* and *Atma* inside the *Kukshi* termed as *Garbha*.

***Shosha*:-** “kq’;Rususfr ¼”kq’k \$ dj.ks Ä½¼ ¼esfnuh dks”k½

Cause of *Garbhashosha* :-

| As per Ayurveda | As per Modern Medicine |
|--|---|
| <p><i>Beej dushti</i> (defect in sperm and ovum), <i>Garbhoghatkara bhava</i> <i>Yonistrava</i> <i>Jarayu dosha</i> <i>Vata Prakopa</i> <i>Jataharini affliction</i> <i>Atibala or Atipraudha stri</i></p> | <p>Genetic factor Congenital anomalies Placental factors- Placenta previa, Placental abruption Multiple gestation Environmental toxins Infection Relative oxygen deficiency- Anemia, High altitude Maternal systemic disease Drugs – Anticonvulsant, Cocaine, Alcohol</p> |

Samprapti :-

- xHkZukM~;k LRooguknYiRok}k jIL; p A fpjs.kI;k;rs xHkZLrFkSokdkyHkkstukr~A vdqf{kiwj.ka xHkZLiUnua eUneso p bfrAA ¼lq- la- “kk- 10@5½ MYg.k Vhdk½

Due to nutritional deficiency, *Rasakshaya* takes place which leads to vitiation of *Vata* and it ultimately leads to *Dhatukshaya* in *Garbhini* and *Garbha* .

• ;rks ;ksfuijL=okRdkj.kkr~ ok;q% dqfir%
 fiYk'ys'ek.kkS ifjx`á xHkZL; jlogka ukMh
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 â- "kk- 2@14&15 v.- Vhdk½

- **Adhithana** - Garbhashaya, Rasavahi Nadi
- **Rogamarga** - Abhyantara

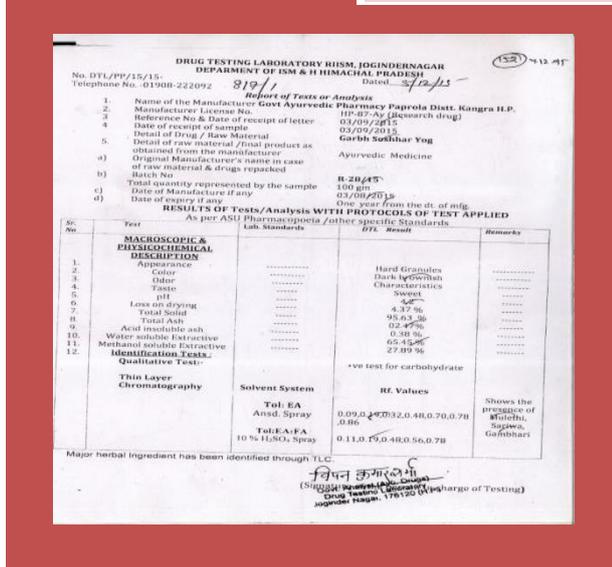
Drug review:- The drug selected for the present study is *Garbhashahar* Yoga. It is described in *Astanga Samgraha Chikitsasthana* in the context of *Garbhashayata Vata Chikitsa*.

Samprapti ghatak:-

- **Dosha** – Vata Pradhan Tridosha
- **Dushya** - Rasa, Rakta, Oja
- **Srotasa** - Rasavaha, Raktavaha, Artavavaha
- **Srotodusti** - Sanga

"kq';fr rq xHksZ ckys'kq p
 ;'Vhe/kqddk'e;ZQy"kkfjok"kdZjk J'ra i;ks n|kr~A ¼v-
 la- fp- 23@12½

| Sr.No | Name | Botanical Name | Part Used |
|-------|----------|----------------------|-------------|
| 1 | Sariva | Hemidesmus indicus | Moola |
| 2 | Madhuk | Glycyrrhiza glabra | Moola |
| 3 | Gambhari | Gmelina arborea | Phala majja |
| 4 | Sita | Sacchrum officinarum | Niryas |



II. MATERIAL AND METHODS

Selection of patient: - Pregnant women with Asymmetrical IUGR from OPD or IPD of PTSR Department were randomly selected and divided in 2 groups for this clinical research irrespective of caste, occupation, and area of residence.

| Inclusion criteria | Exclusion criteria |
|---|---|
| <ul style="list-style-type: none"> • Patients willing for the trial. • Pregnancy b/w 29 to 36 weeks of gestation. • Fundal height less than period of amenorrhea. • USS suggestive of Asymmetrical IUGR | <ul style="list-style-type: none"> <input type="checkbox"/> Patient not willing for trial <input type="checkbox"/> Symmetrical IUGR <input type="checkbox"/> Chronic hypertension <input type="checkbox"/> Impaired renal functions <input type="checkbox"/> K/C/O Thyroid dysfunction <input type="checkbox"/> K/C/O Diabetes mellitus |

Study design:-

| | |
|--|--|
| Trial Group : - In this group 15 patients were registered and treated with <i>Garbh Shoshara Yoga</i> 5 gram twice daily with milk. | Control Group : - In this group 15 patients were registered and treated with L. Arginine 3 gm + Proanthocyanidin 75 mg alternate day dissolved in 1/2 glass of water. |
|--|--|

Duration of trial and follow-ups:- Drugs were given after diagnosis of IUGR till delivery. Follow-ups were scheduled after 2 weeks for assessment of fetal growth.

Investigation:- Following investigations were carried out to include the patient in trial :-

- Haemogram (Hb gm%, TLC, ESR)
- Glucose Tolerance Test
- Urine examination (Routine & microscopic)
- RFT (Blood Urea, Serum Creatinine)
- HIV screening, HBsAg, VDRL
- USG for fetal well being

In the present study, effectiveness of treatment was assessed based on data obtained by clinical examination, laboratory and USG findings, which were carried out at initiation of trial as well as in follow ups and after delivery. In the present study, the grading system was adopted for assessment and improvement was shown in decreasing order.

Demographic profile –

Table no 1- Age wise distributions

| S. N. | Age (in years) | No. of patients in trial group | % age | No. of patient in control group | %age |
|-------|----------------|--------------------------------|--------|---------------------------------|--------|
| 1 | 19-21 | 2 | 13.33% | 1 | 6.67% |
| 2 | 22-24 | 4 | 26.67% | 5 | 33.33% |
| 3 | 25-27 | 5 | 33.33% | 6 | 40% |
| 4 | 28-30 | 4 | 26.67% | 3 | 20% |

Table no 2- Socioeconomic status wise distributions

| S. N. | Socioeconomic status | No. of patients in trial group | % age | No. of patients in control group | %age |
|-------|----------------------|--------------------------------|--------|----------------------------------|--------|
| 1 | High | 2 | 13.33% | 3 | 20% |
| 2 | Middle | 6 | 40% | 7 | 46.67% |
| 3 | Lower | 7 | 46.67% | 5 | 33.33% |

Table no 3- Gravidity wise distributions

| S. N. | Gravidity | No. of patients in trial group | % age | No. of patients in control group | %age |
|-------|----------------|--------------------------------|--------|----------------------------------|--------|
| 1 | Primigravida | 7 | 46.67% | 8 | 53.33% |
| 2 | Second gravida | 4 | 26.67% | 5 | 33.33% |
| 3 | Third gravida | 2 | 13.33% | 1 | 6.67% |
| 4 | Fourth gravida | 1 | 6.67% | 1 | 6.67% |

Table no 4- Gestational age wise distributions

| S. N. | Gestational age | No. of patients in trial group | % age | No. of patients in control group | %age |
|-------|-----------------|--------------------------------|--------|----------------------------------|--------|
| 1 | 29-32 weeks | 2 | 13.33% | 7 | 46.67% |
| 2 | 33-36 weeks | 13 | 86.67% | 8 | 53.33% |

Table no 5- Bleeding per vaginum history wise distributions

| S. N. | H/O p/v bleeding | No. of patients in trial group | % age | No. of patients in control group | %age |
|-------|------------------|--------------------------------|--------|----------------------------------|--------|
| 1 | Present | 4 | 26.67% | 2 | 13.33% |
| 2 | Absent | 11 | 73.33% | 13 | 86.67% |

III. RESULTS

Table no 6- Effect of therapy on SFH

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 2.667 | 1.200 | 1.467 | .834 | .215 | 6.813 | <0.001 | H.S. |
| Control group | 2.133 | 2.267 | 0.133 | 1.457 | 0.376 | 0.354 | >0.05 | N.S. |

Table no 7- Effect of therapy on abdominal girth (cm)

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|---------|------------|-----------------|--------|--------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 88.133 | 104.933 | 16.800 | 5.003 | 1.292 | 13.006 | <0.001 | H.S. |
| Control group | 84.300 | 95.520 | 11.220 | 5.085 | 1.313 | 8.545 | <0.001 | H.S. |

Table no 8- Effect of therapy on maternal weight

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|--------|------------|-----------------|--------|--------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 55.133 | 58.133 | 3.607 | 1.031 | .268 | 13.545 | <0.001 | H.S. |
| Control group | 51.800 | 54.500 | 2.700 | 1.424 | 0.368 | 7.342 | <0.001 | H.S. |

Table no 9- Effect of therapy on fetal weight

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 2.267 | 1.133 | 1.133 | 0.743 | 0.192 | 5.906 | <0.001 | H.S. |
| Control group | 2.533 | 2.133 | 0.400 | 0.737 | 0.190 | 2.103 | <0.01 | S. |

Table no 10- Effect of therapy on fetal weight

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 2.267 | 1.133 | 1.133 | 0.743 | 0.192 | 5.906 | <0.001 | H.S. |
| Control group | 2.533 | 2.133 | 0.400 | 0.737 | 0.190 | 2.103 | <0.01 | S. |

Table no 11- Effect of therapy on Amniotic Fluid Index

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 1.400 | 0.467 | .933 | .704 | .182 | 5.137 | <0.001 | H.S. |
| Control group | 1.267 | 0.677 | 0.600 | 0.507 | 0.131 | 4.583 | <0.001 | H.S. |

Table no 12- Effect of therapy on Head Circumference

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|-------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 1.600 | 1.267 | 0.333 | 0.488 | 0.126 | 2.646 | <0.01 | S. |
| Control group | 2.067 | 1.600 | 0.467 | 1.552 | 0.401 | 1.164 | >0.05 | N.S. |

Table no 13- Effect of therapy on Abdominal Circumference

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|--------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 2.667 | 1.000 | 1.667 | .617 | .159 | 10.458 | <0.001 | H.S. |
| Control group | 2.600 | 1.133 | 1.467 | 0.915 | 0.236 | 6.205 | <0.001 | H.S. |

Table no 14- Effect of therapy on HC/AC ratio

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 2.00 | 0.200 | 1.800 | .561 | .145 | 2.435 | <0.001 | H.S. |
| Control group | 2.00 | 0.600 | 1.400 | 0.828 | 0.214 | 6.548 | <0.001 | H.S. |

Table no 15 - Effect of therapy on FL/AC ratio

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 1.933 | 1.267 | 0.667 | 0.617 | 0.159 | 4.183 | <0.001 | H.S. |
| Control group | 2.00 | 1.400 | 0.600 | 0.507 | 0.131 | 4.583 | <0.001 | H.S. |

Table no 16- Effect of therapy on fetal heart rate

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|--------|--------|
| | BT | AT | | S.D. ± | S.E. ± | T | P | |
| Trial group | 1 | 0.133 | 0.867 | 0.352 | 0.0909 | 9.539 | <0.001 | H.S. |
| Control group | 0.467 | 1.33 | 0.333 | 0.724 | 0.187 | 1.784 | <0.01 | S. |

Table no 17- Effect of therapy on maternal blood urea level

| Group | Mean score | | difference | Paired 't' test | | | | Remark |
|---------------|------------|--------|------------|-----------------|-------|-------|-------|--------|
| | BT | AT | | S.D. ± | S.E.± | T | P | |
| Trial group | 20.800 | 21.933 | 1.133 | 10.446 | 2.697 | 0.420 | >0.05 | N.S. |
| Control group | 16.733 | 21.600 | 4.867 | 7.150 | 1.846 | 2.636 | <0.01 | S. |

Table no 18 - Effect of therapy on serum creatinine level

| Group | Mean score | | Difference | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|-----------------|--------|-------|-------|--------|
| | BT | | | S.D. ± | S.E. ± | T | P | |
| Trial group | 0.660 | 0.633 | .0267 | 0.167 | 0.0431 | 0.619 | >0.05 | N.S. |
| Control group | 0.680 | 1.007 | 0.327 | 1.389 | 0.359 | 0.911 | >0.05 | N.S. |

Table no 19- Effect of therapy on placental maturity

| Group | Mean score | | Difference | % change | Paired 't' test | | | | Remark |
|---------------|------------|-------|------------|----------|-----------------|--------|-------|-------|--------|
| | BT | AT | | | S.D.± | S.E. ± | T | P | |
| Trial group | 1 | 1 | 00 | 00 | 00 | 00 | 0 | >0.05 | N.S. |
| Control group | 1 | 1.133 | 0.133 | 13.3% | 0.352 | 0.0909 | 1.468 | >0.05 | N.S. |

Table no 20- Mode of delivery:

| S. N. | Mode of delivery | No. of patients in trial group | % age | No. of patients in control group | %age |
|-------|------------------|--------------------------------|--------|----------------------------------|------|
| 1 | NVD | 13 | 86.67% | 12 | 80% |
| 2 | LSCS | 2 | 13.33% | 3 | 20% |

Table no 21- Status of newborn:

| S. N. | Status | No. of patients in trial group | % age | No. of patients in control group | %age |
|-------|------------------|--------------------------------|-------|----------------------------------|--------|
| 1 | Live and healthy | 15 | 100% | 13 | 86.66% |
| 2 | Still born | 00 | 00 | 00 | 00 |
| 3 | I.U.F.D. | 00 | 00 | 02 | 13.33% |

Table no 22- Intergroup comparison of neonatal parameters

| Parameter | Mean of trial gr. | Mean of Controll G. | M.D. | S.E. | t | P | Significance |
|---------------------|-------------------|---------------------|--------|-------|-------|-------|--------------|
| HC (cm) | 33.987 | 33.680 | 0.196 | 0.05 | 0.957 | >0.05 | NS |
| CC (cm) | 31.73 | 31.14 | 0.587 | 0.097 | 2.232 | <0.01 | Significant |
| MAC (cm) | 10.89 | 9.54 | 1.347 | 0.080 | 2.593 | <0.01 | Significant |
| Length (cm) | 47.70 | 47.13 | 0.567 | 0.08 | 1.021 | >0.05 | NS |
| Weight (g) | 2795.73 | 2541.86 | 253.86 | 32.85 | 2.107 | <0.01 | Significant |
| Pondral index | 0.27 | 0.60 | 0.33 | 0.176 | 1.889 | >0.05 | NS |
| APGAR (after 1 min) | 0.33 | 0.67 | 0.33 | 0.225 | 1.479 | >0.05 | NS |

IV. DISCUSSION

Maximum number of patients i.e. 33.3% in the trial group and 40% in the control group belong to the age group of 25-27 years. Maximum patients were- Educated up to matriculation (33.3% in Trial Group and 26.67% in Control Group), Belong to rural area (73.33% in Trial Group and 86.67% in Control Group), Middle class economic status (40%) in the Trial Group and 46.67% in the Control Group. As far as diet was concerned 66.67% patients in the Trial Group and 53.33% in the Control Group were vegetarian. Majority of the patients were having Madhyam kosha (60% in the Trial Group and 53.3% in the Control Group). Maximum no. of the patients (46.67% in the Trial Group and 53.3% in the Control Group) were Primigravida (66.67% in the Trial Group and 73.3% in the Control Group). Patients of trial group showed highly significant improvement in Symphysis fundal height, Abdominal girth, Fetal weight, Maternal weight, Amniotic Fluid Index, Fetal abdominal circumference, HC/AC ratio, FL/AC ratio and Fetal heart rate ($P<0.001$). Patients of the Control group showed significant improvement in Abdominal girth, Maternal weight, Amniotic fluid index, Fetal abdominal circumference, HC/AC ratio and FL/AC ratio ($P<0.001$). Hb gm%, TLC, DLC, ESR and GTT, Blood urea, Serum creatinine and BP remain within normal limits in both groups. The mean birth weight of neonates was more in the Trial group (2.795 Kg) than the Control group (2.541 Kg.). On intergroup comparison Abdominal girth, Maternal weight, Fetal weight and Fetal Heart Rate showed significant differences ($P<0.05$), meaning these parameters were better in the Trial group than the Control group. An intergroup comparison of neonatal examination showed significant difference in chest circumference, mid arm circumference and birth weight ($P< 0.05$). No maternal or fetal complications were reported in the Trial group.

➤ Mode of action of Garbhashoshahara Yoga:-

Drug has Vata-Pitta Shamak and Saptadhatuprashadaka property due to Madhur Rasa, Ojovardhaka and Vata Shamaka due to Guru and Snigdha Guna, Pitta Shamaka and Kapha Vardhaka due to Sheeta Veerya and Madhur Vipaka. As per Samprapti, it was clear that Garbhashosh is due to Vata predominance with Pitta-Kapha Anubandha and Garbhashoshahara Yoga having Tridosha Shamak property. The Rasayana effect of Garbhashoshahara Yoga cause better Dhatu Poshana in

mother and in fetus. Garbhashoshahara Yoga has antioxidant properties. It scavenges free radicals, enhances the immunity and general strength of the body as well as prevents injury to the vascular bed. Due to anti-inflammatory property, it removes the congestion of vascular endothelium and placenta. So, improves placental circulation. It inhibits platelet aggregation, thus prevents clot formation in placental vessels.

➤ Mode of action of L-arginine and Proanthocyanidin:-

L –arginine:- (2-amino-5-guanidinovaleric acid) is semi –essential amino acid. In the body, L-Arginine is converted to nitric oxide. Nitric oxide is a potent vasodilator and in case of IUGR placental production of nitric oxide decreased. Arginine increases fetal nutrient delivery by stimulating maternal growth hormone secretion. L-arginine in modest amounts stimulates fetal insulin secretion and insulin is a major anabolic hormone in the fetus. **Proanthocyanidine :-** Nurtilizes L-arginine induced harmful byproducts:-Peroxynitrite, Peroxide and Superoxide. Proanthocyanidins have affinity for vascular tissue and strongly inhibit several enzymes involved in degradation of collagen and elastin thus preventing oxidative injury to vascular endothelium.

V. CONCLUSION

IntraUterine Growth Restriction (IUGR) refers to a condition in which a fetus is unable to achieve its genetically determined potential size. Several disorders affecting fetal health and causing Garbhashosh along with their treatment are described in Ayurvedic classics. IntraUterine growth restriction remains one of the main challenges in maternity care. Garbhashoshahara Yoga is cost effective and well tolerable. The safety and efficacy of the drug was confirmed by the fact that all women showed maternal and fetal weight gain without any complications after administration of the drug. From the observation it was concluded that Garbhashoshahara Yoga was effective in improving the IntraUterine Fetal Growth Restriction. It showed better improvement on fetal weight as compared with Standard drugs.

SUGGESTION

The study was conducted on a very small scale. However, the results of the study were encouraging, so large scaled clinical trials should be done. Doppler study of Uterine and Umbilical arteries should be done for better assessment. Postnatal follow ups should be done to observe the growth and development of the baby.

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