Case Report

Management of premature contractions with *Shatavaryadi Ksheerapaka Basti* - A Case Report

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Abstract

Premature contraction of the uterus is the very first sign of premature labour, which is followed by progressive changes in cervix such as effacement and dilatation. Four or more uterine contractions with or without pain per hour is a major biophysical predictor of preterm labour. According to the WHO statistics, every year, an estimated 15 million babies are born preterm and this number is rising. Although tocolytic agents are used to suppress premature contractions and prevent preterm labour, it is not proven to be efficacious in preventing preterm birth or reducing neonatal mortality or morbidity. As per Ayurveda, *Akala Prasava* (preterm labour) results due to the malfunctioning of *Apana Vata* (a type of *Vata Dosha* which is responsible for the excretory action). *Basti* (medicated enema therapy) is considered the best for managing the deranged *Apana Vata. Basti* is also indicated in *Garbhini Paricharya* (routine antenatal care) after completion of seven months of pregnancy. In this present case study, *Shatavaryadi Ksheerapaka Basti* (medicated enema prepared along with milk) was administered in a 28 year old second gravida patient of 33 weeks gestation with premature contractions, wherein isoxsuprine hydrochloride proved to be ineffective. Per-rectal *Basti* with 450 ml *Shatavaryadi Ksheerapaka* administered for 2 consecutive days was found to be effective in preventing the uterine contractions and further advancement to preterm labour. The drugs in *Shatavaryadi Ksheerapaka Basti* possess antioxytocic and vasodilating properties which may effectively curtailed the progress of premature contractions.

Keywords: *Akala Prasava*, premature contraction, preterm labour, *Shatavaryadi Ksheerapaka Basti*, tocolytics

Introduction

Preterm labour is defined as the presence of uterine contractions of sufficient frequency and intensity to effect progressive effacement and dilatation of the cervix before term gestation (between 20 and 37 weeks).[1] Preterm birth is a major contributor to perinatal mortality and morbidity, affecting around 9% of births in high income countries and an estimated 13% of births in low and middle income countries.[2] If there are uterine contractions with no corresponding cervical dilatation, then it can be considered as threatened preterm labour.[3] The exact mechanism of preterm labour is unknown but is believed to include multiple gestation, polyhydramnios, cervical incompetence, uterine distortion, cervical inflammation, maternal infections, fever, urinary tract infection, hormonal changes mediated by maternal or fetal stress and uteroplacental insufficiency.[1] Premature contractions further result in premature labour causing fetal complications such as respiratory distress syndrome (RDS), necrotizing enterocolitis, cerebral edema and mental retardation.

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Management includes rest in left lateral position, adequate hydration, antenatal corticosteroids, progesterone (orally or vaginally) and tocolytics. Prophylactic antibiotic is administered if the membrane is ruptured. Steroids are indicated in women at risk of preterm labour before 36 weeks including PPROM (Preterm premature rupture of the membranes) to accelerate lung maturity of fetus.[4] Tocolytics are advised before 34 weeks of gestation. The primary purpose of tocolytic therapy is to delay delivery for 48 h to allow the maximum benefit of glucocorticoids to decrease the incidence of RDS and for *in-utero* transfer to a tertiary center. Although advances in the prevention and treatment of premature labour have improved, they have not lowered the preterm birth rate.

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In Ayurveda classics, the preterm labour can be related to *Viprasava* according to *Madhukosha* commentary of *Madhava Nidana*[5] and *Akala Prasava* according to *Arunadatta* commentary.[6] Normalcy of *Shukra* (male reproductive factors), *Artava* (female reproductive factors), *Ashaya* (uterus), *Kala* (Suitable timing for conception) and diet along with life style of mother is essential for the full term delivery of matured fetus.[7] Any abnormality in any of these factors may cause *Akala Prasava*. *Acharya Harita* opines that delivery can take place before completing full term, due to the abnormalities of *Dosha* especially propelled by *Vayu*.[8] *Apana Vayu* is responsible for the expulsion of fetus.[9] Premature labour occurs due to derangement of *Prasuti Maruta (Apana Vata* responsible for expulsion of foetus) due to various causes.[10]

Prachalita Garbha and *Prasramsamana Garbha* are the terms used by ancient *Acharya* for denoting the displaced fetus from its normal position such as low lying etc. Many formulations are described for the treatment of Fetus displaced from normal position and for the prevention of *Garbhasrava* (abortion) in each month of pregnancy by *Sushruta,*[11] *Vagbhata,*[12] *Yogaratnakara*,[13] *Harita*,[14] *Bhavaprakasha*[15] etc. Majority of the *Acharya* indicated the formulation for excessive pain due to *Chalita Grabha* or *Garbhasrava* as various medicated milk formulations.[16,17] *Ksheerapaka* has been mentioned in Ayurveda classics for treating *Prasramsamana Garbha* with the symptoms like *Parshva Prishtha Shoola* (pain in the flanks and low back), *Asrigdara* (bleeding per vagina) etc.[17]

Case Report

A 28-year-old married woman visited the Prasutitantra and Streeroga outpatient department (OPD) of Institute for Postgraduate Teaching and Research in Ayurveda, Jamnagar, on January 6, 2017 with the complaints of lower abdominal pain radiating to both thighs and low back, at 33rd week of gestation. She was also complaining of reduced appetite and constipation. She was second gravida with last menstrual period on 23rd May, 2016 and had estimated date of delivery on 2nd March, 2017. Her antenatal period throughout was uneventful with normal ultrasonographic (USG) findings. Obstetric history revealed a previous normal delivery of a female child 5 years back with no history of abortion. Hematological, biochemical and microbiological investigations were found to be within normal limit. On examination, the general condition of the patient appeared healthy. Blood pressure (BP) was 110/80 mmHg and pulse was 70 bpm. No pallor and edema were present. Per-abdomen examination revealed longitudinal lie with cephalic presentation and fundal height corresponding to 32 weeks of pregnancy. Fetal head was found to be engaged. Mild uterine contractions lasting for 10–15 s in every 30–45 min associated with severe pain was noted. Fetal heart rate was found to be 138 bpm. Per-vaginal examination was withheld with the fear of inducing further uterine contraction.

Considering the premature contractions, she was advised admission in the Prasutitantra and Streeroga ward in inpatient department. She was advised complete bed rest with foot end elevation and light diet. Isoxsuprine hydrochloride injection 5 mg intramuscularly 6 hourly for 1 day (total 4 doses) was given. Later on, half tablet of Tidilan Retard (Isoxsuprine 40 mg) was given orally twice daily after food. Routine blood and urine investigations were carried out which were in normal range. For 2 days, abdominal pain was absent and uterus was relaxed. Vitals were normal. Fetal heart rate and fetal movements were also regular.

On the 3rd day (January 8, 2017), the patient again developed lower abdominal pain and low backache. Uterine contractions lasting 10–20 s in every 30 min were present. Foetal heart sound (FHS) was 130 bpm and BP was 100/70 mm of Hg. She was given betamethasone 1 ampule IM 2 doses (12 h apart). USG showed adequate amniotic fluid index and normal fetus with engaged head. Per-vaginal examination revealed multiparous os with no effacement. Isoxsuprine tablet 20 mg (half tablet of Tidilan Retard) was repeated 6th hourly orally.

On the next day (9th January, 2017), the patient experienced nausea and vomiting. Appetite and sleep were found to be reduced due to the pain. The vitals and FHS were monitored 2 hourly and were found to be normal. The next day (10th January, 2017) evening, again, the patient complained of severe abdominal pain and low backache. Uterine contractions were felt per abdomen lasting 15–25 s at every 20–30 min. FHS was found to be normal. On per-vaginal examination cervical dilatation was found to be 1 cm with no effacement.

Isoxsuprine tablets were discontinued and *Shatavaryadi Ksheerapaka Basti* was planned. *Ksheerapaka* consists of mainly three ingredients, i.e., *Shatavari* (*Asparagus racemosus* Willd.), *Bala* (*Sida cordifolia* Linn.) and *Arjuna* (*Terminalia arjuna* Roxb.) taken in equal amounts as shown in Table 1. Fine powder of *Shatavari*, *Bala* and *Arjuna* in an equal quantity of 10 g each (total 30 g) was boiled with 15 parts of milk (450 ml) and 15 parts of water (450 ml) until only milk part remains. The above procedure was carried out on mild heat. Thus, obtained *Ksheerapaka* was filtered and used for the *Basti* procedure.[18] *Shatavaryadi Ksheerapaka Basti* 450 ml was administered through rectal route very slowly in the left lateral position at 5.30 pm on 10th January, 2017. After evacuation of *Basti*, the patient got relief from the abdominal pain within 3–4 h. *Ksheerapaka Basti* was continued for 1 more day (January 11, 2017, at 7.00 am) and the patient got complete relief with

Table 1: Ingredients of *Shatavaryadi Ksheerapaka Basti*

Name of drugs	Latin name	Part used	Quantity
Shatavari	*Asparagus racemosus* Willd.	Dry root	1 part (10 g)
Bala	*Sida cordifolia* Linn.	Dry whole plant	1 part (10 g)
Arjuna	*Terminalia arjuna* Roxb.	Dry stem bark	1 part (10 g)

no further uterine contractions or backache. She was under observation for 1 more day and was discharged on January 13, 2017. She was advised to take *Shatavaryadi Ksheerapaka* 90 ml orally twice daily empty stomach for a week. The patient was advised to report OPD weekly for regular antenatal checkup. The patient had continued the pregnancy till term and delivered a healthy full-term male baby of 2.7 kg on February 15, 2017 (period of gestation – 38 weeks 2 days).

Procedure of *Basti*

Freshly prepared lukewarm *Shatavaryadi Ksheerapaka Basti* was administered to the patient lying in the left lateral position. First, the Enema can was attached with the tube along with nozzle having regulator for controlling the flow of the contents of *Basti*, i.e., medicated milk. The nozzle was then attached with rubber catheter no. 8 and used for administration of *Basti*. After that, *Basti* material was taken in the enema can. Anal orifice and tip of the catheter were lubricated with the *Bala Taila* (medicated oil) and air was removed from tube, nozzle and the rubber catheter. Then, the flow of *Basti* material was adjusted with the help of the regulator in the nozzle, i.e., approximately 100–120 drops/min (approximately 8–10 ml/min). After that, the tip of catheter was inserted into anal canal of the patient steadily and slowly following the curve of the vertebral column until it reached inside up to 3–4 inches. The patient was encouraged for deep breathing. Approximately 50–55 min were taken for the completion of procedure. After administration, the patient was asked to lie in supine position and rest on the table till she feels the urge for defecation. *Basti* was evacuated within 5–10 min on both days. Pre operative procedures such as *Abhyanga* (body massage) and *Swedana* (fomentation) were withheld. The posology details are mentioned in Table 2.

Discussion

Isoxsuprine hydrochloride is a beta-sympathomimetic drug. It stimulates β_2-receptors in the uterine muscle, activating adenyl cyclase, increasing cAMP and thus reducing intracellular calcium. Isoxsuprine also produces peripheral vasodilation by a direct effect on vascular smooth muscle, primarily within skeletal muscle with little effect on cutaneous blood flow.[19] Although to some extent isoxsuprine relaxes the premature uterine contractions, it is found that continuous use of isoxsuprine exhibits some adverse effects such as tachycardia, hypotension, hyperglycemia and irritable uterus. Although delivery may be delayed long enough for the administration of corticosteroids, this treatment does not result in improved perinatal outcome. Therefore, there is a definite need for alternative, safe and effective treatment to arrest the preterm contractions right from the beginning.

Increased premature contractions (*Avi*) are induced due to vitiation of *Vata* mainly *Apana Vata*. For alleviating *Vata*, the best method is *Basti*.[20] *Basti* causes evacuation of stools and thereby relives premature contraction caused due to constipation. *Basti* is also indicated in the pregnant women after the completion of the 7th month.[21] Moreover, the drugs given in *Basti* form have specific target action and quick absorption. *Shatavaryadi Ksheerapaka* is planned in this case study as it shows antioxytocic effect relieving the uterine contractions. It is given in *Basti* form, as larger quantity of drug can be administered for effective action and quick absorption through this route. *Ksheera Basti* further normalizes *Vata* by the downward movement and relieves any sort of pain. The properties and action of the ingredients of *Shatavaryadi Ksheerapaka Basti* are shown in Table 3.

Shatavari and *Bala* possess *Rasayana* (rejuvinating), *Garbha Poshaka* (nourishing the fetus), *Balya* (strengthening) and *Pushtidayaka* (anabolic) action, which maintains and supports the pregnancy. *Vata* pacifying property of *Bala* controls the *Apana Vata* and subsides the premature contraction and pain. *Prajasthapana* (procreative) and *Ojo Vardhaka* (revitalizing) properties prevent premature labor and stabilize the *Ojas*. *Arjuna* possesses *Sandhanakara* (healing) property, which normalizes the uterine musculature and its *Shonita Prasadana* (blood purifying) property may increase the blood supply of uterus.

Table 2: Posology of *Shatavaryadi Ksheerapaka Basti*

Procedure	Drug	Form	Dose	Route	Method of administration
Basti	*Shatavari, Arjuna, Bala, milk, water*	*Ksheerapaka* liquid	450 ml	*Anal canal*	Slowly like drip, 100-120 drops/min

Table 3: Properties and pharmacological action of the drugs in *Shatavaryadi Ksheerapaka*

Drugs	Properties	Pharmacological action
Shatavari (*Asparagus racemosus* Willd.)	*Rasayana, Garbha Poshaka, Balya, Pushtidayaka, Medhya, Vata Shamaka, Ojo Vardhaka, Prajasthapana, Brimhana, Balya, Agnivardhaka, Vedana Sthapana, Mutrajanana Vaya Sthapana*[22,23]	Antioxidant, antistress, adaptogenic, antioxytocic, antispasmodic, antibacterial[24]
Bala (*Sida cordifolia* L.)	*Vata Shamaka, Rasayana, Ojo Vardhaka, Praja Sthapana, Brumhana, Balya, Anulomana, Hridya*[25,26]	Adaptogen, analgesic, anti-inflammatory, antioxidant, cardiotonic, diuretic, immunomodulatory, anticandicidal, antistress, radical scavenging activity[27]
Arjuna (*Terminalia arjuna* (Roxb.) Wight and Arn.)	*Hridya, Sandhanakara, Shonita Prasadana*[28,29]	Antioxidative, antibacterial antiviral, free radical scavenging, diuretic[30]

Many studies have proven antioxytocic effect of *Shatavari*. Alcoholic extract of *Shatavari* was found to produce a specific block of pitocin induced contraction, confirming its action as uterine sedative.[31] Further, Shatavarin 1; a glycoside isolated from the roots of *Shatavari*, was found to be responsible for the competitive block of oxytocin induced contraction of rat, guinea pig and rabbits uteri, *in vitro* as well as *in vivo*.[32] The saponin rich fraction obtained from *Shatavari* was found to inhibit oxytocin induced uterine contractions *in-vivo*.[33]

Bala, Arjuna and *Shatavari* have antistress, adaptogenic, antioxidant, and free radical scavenging properties, which decreases cellular sensitivity to stress. They are protective against other general stressors such as oxidative stress. *Arjuna* is also capable of producing vasodilation and thus prevents the premature contractions. *Arjuna* has hypotensive and cardiotonic properties and beneficial in preterm labor caused due to hypertension.

Genital tract infections trigger the preterm labor by stimulating the prostaglandin synthesis which in turn induces preterm contractions. Methanol extract of *Shatavari* shows antibacterial activity. The anticandicidal property of *Bala*; diuretic, antibacterial and antiviral action of aqueous extract of *Arjuna* and antibacterial property of *Shatavari* all together are effective in relieving genital tract infections which is a cause for preterm labour.

As there are no substitutions available for tocolytics till date to prevent preterm labour, after the initial administration of prophylactic dose of tocolytics, the uterine premature contractions may be managed by Ayurvedic drugs. *Shatavaryadi Ksheerapaka Basti* not only may subside the premature contraction by virtue of its *Balya* (strengthening), *Brimhana* (nourishing) *Prajasthapana* (procreating), *Rasayana* (rejuvinating) etc., properties but may also improve the perinatal outcome.

Conclusion

In this case study, *Shatavaryadi Ksheerapaka Basti* is found to be very efficient in preventing premature contractions when administered in 8th month of pregnancy. It is given in *Basti* form as larger quantity of drug can be administered for effective action and quick absorption through this route. In severe cases of premature contractions, it is better to use *Shatavaryadi Ksheerapaka Basti* after stabilizing the patient with tocolytics initially. To scientifically validate the efficacy of *Shatavaryadi Ksheerapaka Basti* in premature contractions, further clinical studies with appropriate methodology are necessary.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understand that her names and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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