

Concept of Uterine Involution and its enhancement through Ayurvedic approaches

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Abstract:

The puerperium is the period of time immediately after delivery until 6 weeks post-partum in which genital organs return back to their normal physiological and histological condition as in non gravid state. Ayurvedic authorities have given different opinion regarding this period. However one and a half month is the most accurate time period decided by *acharyas*. The most important physio-anatomical change that occurs during this period is the uterine involution where uterus reverts back from its huge pregnant state to normal non pregnant state. Also prevention of some neurological, musculoskeletal and psychological disorders occurring during this period are also matter of attention as they not only affect uterine involution but also responsible for high mortality of mothers. So Ayurvedic approaches which are mentioned in Ayurvedic texts are needed to combat this process early and effectively. Practicing *Mulabandha* may play major role in prevention of such disorders and enhancing uterine involution.

Key words: *Sutika*, Puerperium, *Mulabandha*, *Pranayama*, Post-partum

Introduction

Ayurveda is the science of life being practiced in India since time immemorial.¹ Woman has always been the prime person of concern in Ayurvedic classics. There are three phases of woman's reproductive life described in them i.e. *Rajaswala* (menstrual phase), *Garbhini* (pregnant phase) and *Sutika* (puerperal phase).² Problems that can be adhered to woman's reproductive phase can be divided into two parts. The problems that occur in non pregnant woman and outside the puerperal period of six weeks are known as gynecological morbidity and the problems that occur during pregnancy, delivery or puerperal period are known as obstetric (maternal) morbidity.³ Every year around eight million women suffer from the pregnancy related issues worldwide and half a million die out of these complications in which most of the deaths occur in developing countries.⁴ Woman's health is given prime importance as her health is responsible for her progeny too and this is most important during just after her delivery. The puerperium is the period of time immediately after delivery until 6 weeks post partum in which genital organs return back to their normal physiological and histological condition as in non gravid state. During this period, the uterus which weighs more than 1 kg just after delivery

undergoes the physiological involution and reduces its weight to around 80 grams i.e. non-pregnant state.⁵ It is referred to as *Sutika kala* in *Ayurveda*. *Acharya Kashyapa* had given a huge description of *Sutika* and clearly stated that a woman can only be called as *Sutika*, when she had expelled out her placenta after her delivery.⁶ *Sutika kala* is the period that is followed by delivery. It starts about an hour after expulsion of placenta and takes over six weeks.⁷ In *Ayurveda*, different *acharyas* had given different time period of *Sutika kala*. *Acharya Charak*⁸ has not mentioned any specific time period while *acharya Sushrut*⁹ had mentioned one and a half month as *Sutika kala*. *Vagbhatta*,^{10,11} *Bhavaprakasha*¹² and *Yogaratanakara*¹³ had mentioned that *Sutika kala* is the duration of one and a half month or up to recurrence of menses. *Kashyapa* had mentioned that a woman take 6 months for regaining her *dhatu*s again.¹⁴

During puerperium, the woman can suffer from so many problems like fever, diarrhea, edema, colic pain, distension of abdomen, weakness, drowsiness, anorexia, delirium, and other diseases that are caused due to vitiation of *Kapha* as well as *Vata*. The classical concept of *Ayurveda* defines the ways to maintain all three *doshas* i.e. '*Vata*', '*Pitta*,' and '*Kapha*' in a balanced state to prevent diseases.¹⁵ These are difficult to cure because of the decrease in muscle tissue and strength in women after delivery due to exertion of labour pain and excretion of *kleda* and blood from her body. *Sutika's sharira* is thus referred as *shoonya sharira*. Diseases associated with the puerperal period are termed as *Sutika roga* (puerperal diseases).¹⁶

Uterine involution

As both modern and Ayurvedic sciences give emphasis to the return of non pregnant state i.e. revert back of uterus to its normal position therefore deep knowledge of this process needs to be understood. Uterine involution forms the most important characteristic of post-partum period. Earlier it was measured by palpating the fundal height but it was not easy to palpate in obese women and those suffering from uterine myoma.¹⁷ So, when Donald et al.¹⁸ proposed ultrasound in 1958, uterus seems to be one of the most concerned organs to evaluate. The length, width, antero-posterior diameter, thickness of uterine wall and volume of uterus and uterine cavity is primarily concerned during ultrasonography of post partum woman. With more advancement, color and doppler ultrasonography came and it became easier to assess the hyper vascular areas in myometrium and the haemodynamic events occurring during post-partum. Pulsatility indices (PI) and resistance indices (RI) in uterine artery are measured to understand the normal physiology of uterine involution. Uterus and uterine cavity is examined in sagittal, transverse and coronal sections. The shape, size, position and texture of uterus can be examined via ultrasonography machines. This can be performed trans-abdominally or trans-vaginally. However, during early and middle postpartum period(<2 Weeks) the uterus is quite large and vaginal probe is not able to go fully inside the uterine cavity so trans-abdominal ultrasonography is preferred and after 2 weeks when uterus reaches the true pelvis, trans-vaginal ultrasonography is preferred so that minute details can be observed.⁵

Ayurveda states that many different kinds of diseases can occur during this period if it is not managed properly. So, time to time different therapies and treatment are tested which can improve the woman's health and prevent these diseases from occurring.

Aims and objectives

There are so many studies in which uterine involution is studied and published. Many of them are performed in animals; only few are performed in humans. So, more researches of normal uterine involution during *Sutika kala* are needed. This study aims in describing the *Ayurvedic*

concepts of *Sutika*, *Sutika kala* and changes that occur during this period in the body of *Sutika*. Uterine involution which is the most important aspect during this period is dealt here. Normal uterine involution needs to be understood for diagnosing the abnormalities and avoid using invasive procedures. Abnormal uterine involution can result in maternal death world-wide; therefore correct diagnosis is of paramount importance. Ultrasound is the non-invasive and low cost technique that helps in assessing the normal and abnormal puerperal dynamics.¹⁹ This helps in the easy diagnosis of puerperal disorders and thus results in healthy status of *Sutika* and her progeny. The second aim is to describe some non-pharmacological and pharmacological treatments that can be advised during this period.

Material and Methods

For this review study, Ayurvedic classics and modern texts were keen searched regarding *sutika*, *sutika kala*, *sutika roga*, changes in pregnant woman, uterine involution and ultrasound procedure during puerperium and treatment protocols for *sutika*. Amalgamation of modern knowledge and procedures were done with Ayurvedic concepts and results were drawn. Ayush research portal, DHARA, Google scholar and Pubmed search engine were used for searching the relevant articles. The last search was done on 5th June 2020. Keywords that were used are ‘*Sutika*, *Sutika kala*, uterine involution + ultrasound’.

Discussion

Uterine involution is the most important phenomenon happening in the body of woman who undergoes delivery. It is a dynamic process that has no parallel process in normal non pregnant woman. It includes two most important physiological life saving processes which are Myotamponade (compression of uterine vessels by myometrial contraction) and thrombotamponade (enhanced blood clotting activity) that occur soon after delivery. Postpartum period can be divided into three durations as follows⁵:

1. Early part of puerperium: the first week duration after parturition
2. Middle part of puerperium: 1-2 weeks duration after parturition
3. Late part of puerperium: time required for involution of genital organs and return of menses i.e. 2wks-6wks duration

Many ultrasonographic studies which are longitudinal and prospective clinical trials reveal that there are different in-vivo conditions seen during different period of puerperium. Most of the studies assess influence of parity, mode of delivery, breast-feeding and birth weight of infant on the process of uterine involution.

1. Early part of puerperium

Wachsberg et al.²⁰ recommended performing segmental measurement of uterus during this phase as uterus is seen as retroflexed, angulated and arched over sacral promontory during this period. This position of uterus is suggestive of heavy corpus, hypotonic lower segment and supine position of women. There can be variation in sonographic appearance of the cavity due to physiological variations in retained decidua. Initially prominent uterine vascular channels are seen on the posterior wall of the uterus and they disappear in 2nd and 3rd week of post-partum as a result of involution. When examining the cavity heterogenous mass with fluid and solid components can be seen around cervical region. But it is not found significant and is

spontaneously expelled out from the body. Lutvica et al.²¹ visualized continuous white line along the entire cavity from internal cervical os to the top of fundus.

2. Middle part of puerperium

During this period the uterus diminishes in size and is almost oval in shape. Uterus rotates along its internal os towards an anteflexed position probably due to formation of firm isthmus. Contrary to earlier condition where heterogenous mass with fluid and solid components was seen only in cervical region, either pure fluid or mixed echo with fluid and solid components can be seen in the whole cavity during this period. This is suggestive of normal healing process occurring at placental site. Necrosis starts in the retained decidua and there is abundant shedding of lochia. Lutvica et al.²¹ found fluid or heterogenous pattern with solid and fluid components filling whole cavity.

3. Late part of puerperium

In this phase, uterus diminishes its size considerably. In majority of the cases, it is returned to its normal anteflexed position. Uterine cavity is seen empty and the necrotic vessels and deciduas are exfoliated thus placental site is fully recovered. New endometrium is regenerated from the basal layer of decidua for the future mensus. Lutvica et al.²¹ observed endometrium as thin white line in USG.

Lochia is another important characteristic which gives useful information about abnormal puerperal state. It refers to the discharge originating from the uterine body, cervix and vagina during the first fortnight of puerperium. It can be inspected by observing the vulval pads for their odour, amount and color. Lochia rubra (1-4 days) is red in color, lochia serosa (5-9 days) is yellowish/pink or pale brownish in color while lochia alba (10-15 days) is pale in appearance.²²

Lutvica et al.²¹ found no co-relation between parity, infant's birth weight or breast feeding. Negishi et al.²³ found A-P diameter and longitudinal diameter significantly vary with breast feeding while Rodeck et al.,²⁴ Defoort et al.,²⁵ Buisson et al.²⁶ and Wachsberg et al.²⁰ found uterine volume of mother to be independent of breast feeding the infant. Paliulyte V et al.²⁷ concluded that the pattern of involution in primiparous and multiparous women is almost similar; however, in multiparous women, it may last longer than puerperial period. Similarly Sokol et al.,²⁸ Defoort et al.²⁵ also found co-relation between parity and uterine involution. Wataganara et al.²⁹ considered the process to be independent of parity. Julliana et al.¹⁹ found significant direct co-relation between infant's birth weight and uterine volume. While Buisson et al.,²⁶ Wachsberg et al.²⁰, Lutvica et al.²¹ rejected this co-relation.

Above said were the normal physiological phenomenons occurring in *Sutika* during *Sutika kala*. Any abnormality in these phenomenons may lead to postpartum haemorrhage and other complications in *shoonya sharira* of *Sutika*.

Approaches towards enhancing uterine involution during postpartum

For proper undergoing of these physiological phenomenons some pharmacological and non pharmacological approaches are advised. Ayurvedic texts mention specific drugs that are given to puerperal women for a definite duration along with specific dietetic regimens. Shukla k. et al. has used *Saubhagya shunthi paka* for puerperal women because it contains all the nutrients

which are required during this period and it can be easily prepared at home.³⁰ This *paka* works well as a post partum tonic and facilitates the normal uterine involution along with enhancing the production of milk. Tiwari P.V. et al. while describing cares during puerperium advised hot water bath at least twice a day and perform specific *raksoghna* measures. To prevent any contact of infection *Sutika* was made to sit over a chair covered with leather bag filled with hot bala-taila.³¹ Puerperal gymnastic is proved to be effective for uterine contractions.³² In same manner, in Ayurvedic classics, yogic exercises can be preferentially adopted for the purpose of uterine involution. In this, *Mulabandha* which is one of the yogic exercises useful in strengthening pelvic organs can help well. *Mula* and *bandha* are Sanskrit words of which *Mula* means the 'root' or the 'lowest part' and *bandha* means 'to lock' or 'to close'. This opening- closing phenomenon of *Mulabandha* is done for the strengthening the muscles of anal canal and pelvic floor.³³ External anal sphincter which is an important part of voluntary control over anal canal is mainly affected by trauma during child birth.^{34,35} Voluntary rhythmic contractions of anal canal muscles by regular practice of *Mulabandha* can indirectly raise the strength of uterine ligaments as it promotes the strengthening of pelvic floor muscles and may lead to progressive enhancement of uterine involution. It is done by pulling of rectal muscles inward affecting on contractibility of pelvic muscles. As per Ayurveda, *apana vayu* is responsible for uterine contractions.³⁶ Practicing *Mulabandha* helps to enhance the activity of *apana vayu* which can lead to uterine involution properly. General management of *Vata* can give better results which include some of the other measures e.g. *Abhyangam* (massage by *Vatashamaka* hot oils), *Swedana* (steaming) by *Vatashamaka dravya* like *Dashmool*, *Utsadana* (rubbing body with unctuous substances), *Parisheka* (applying tolerable hot *Vatashamaka* decoction on body), *Avagahan* (tub bath with tolerable hot *Vatashamaka* decoction) and *Basti karma* (medicated *Vatashamaka* enema including *Vatashamaka* decoction and oil both). Dietary food that are mostly preferred are *Madhura rasa pradhan* (sweeter in taste) including *Jivaniya*, *Bringhaniya dravya*, cow ghee, cow milk, *Shali* rice, *Yava*, *Godhum*, etc. All above steps are very important in preventing disorders during post partum.

Anxiety, depression, agitation, irritability, bipolar disorder, even suicidal tendency are some consequences she may go through. Such challenges cannot be overcome without keeping mind stable. So *Pranayama* and meditation can help to tackle this tough duration. Many studies have proved the efficacy of *Pranayama* and meditation in psychological disorder which helps to reduce these consequences easily.^{37,38} *Nadishodhana kriya* is to be done before starting *Pranayama* for better efficacy. *Anulom-vilom* is safe and easy way of *Nadishodhana kriya* which is done by inspiration with one nostril keeping other closed followed by expiration through previously closed nostril and vice versa. Some clinical practitioners suggest practicing *Mulabandha* along with *Pranayama* for better effect.

Conclusion

There are a lot of discrepancies regarding *Sutika kala* in *Ayurveda*, but all of them had focused on regaining the normal non pregnant stage by *Sutika* during this period. Uterine involution is the most common physiological event going on during this period. The process of uterine involution can be enhanced naturally with Ayurvedic approach. *Mulabandha* and *Pranayama* are better and safe options for the same. These methods can not only improve overall health but also prevent puerperal mothers from dangerous neurological, musculoskeletal and psychological illnesses.

However more studies to prove effects of these approaches on *Sutika* with reference to their parity and mode of delivery should be done.

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