



A PRAGMATIC APPROACH TO ARTAVA VAHA SROTAS

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ABSTRACT: Transportation has been one of the keys for evolution of mankind. The pathways which help in formation, transportation of essential ingredients and flush out the wastes out of the body are explained under the concept of *Srotas* in Ayurveda. *Artava vaha srotas* is a unique concept in Ayurveda, which gives in detailed explanation about the whole female reproductive system. The group of organs which are concerned with 'uthpatti' and 'visarjana' of *Artava* are considered to be the *Moola* of *Artavavaha srotas*. *Garbhashaya* i.e. Uterus which is the main organ concerned with menstruation and other reproductive physiology along with ovaries, fallopian tube cervical canal, cervix, and vagina should be considered under *Artavavaha srotas*. Although the word '*Artavavahi dhamani*' refers to 'menstrual blood carrying arteries' as per translated meaning, there are no such arteries which carry menstrual flow in the body. Hence these points must be understood contextually. If the *viddha lakshanas* of *Artava vaha srotas* mentioned by Acharya Sushruta is interpreted with their pathophysiology, the concept gets more clear. Hence to understand the concept of *Artava vaha srotas*, it is important to put a light on female reproductive hormones, HPO axis, functional anatomy of female reproductive system. This article is aimed at conceptual interpretation of *Artava vaha srotas* with the classical references available for *Artava vaha srotas*.

KEY POINTS : *Artavavaha srotas*, Female reproductive hormones, HPO Axis

INTRODUCTION : *Srotas*, meaning channels or pores, are present throughout the visible body as well as at the "invisible" or subtle level of the cells, molecules, atoms, and subatomic strata. Through these channels the nutrients and other substances are transported in and out of human physiology. When the flow of appropriate nutrients and energies through these channels is unimpeded, there is health; when there is excess, deficiency, or blockage in these channels disease can take root.¹ According to Chakrapani, the commentator of *Charaka Samhita*, the channels which transport the *poshaka dhatus* (the part of the *rasa* etc tissues which

flow to provide nutrition to the successive tissues) are called *Srotas*.² These *srotas* are *atisukshma athibahu aparisankhya* according to their *rachana*.³ The word *Ayanamukhani* is used as adjective of *srotamsi*.⁵ Along with *vahana* of different *dhatu*, *upadhata* and *mala* through *Ayanamukhasravana kriya* always takes place in *srotas*.⁵

Acharya Sushruta has mentioned *Artava vaha srotas* as the '*Antarmukhi srotas*' which is also known as '*Yogavahi srotas*'⁶. Acharya Charaka has not mentioned about *Artava vaha srotas* while explaining about the *srotas* in *vimanasthana* but he has mentioned about '*Retovahi siras*' in *chikitsa sthana*⁷. Acharya Kashyapa also mentions about '*Rajovahi siras*' in *Rakta gulma adhyaya*.⁸

Artavavaha srotomoola : As per Acharya Sushruta the *Moola* of *Artavavaha srotas* are *Garbhashaya* and *Artava vaha dhamanis*.⁹ ie , The *Viddha lakshanas* are mentioned as *Vandhyatva* , *Maithuna asahishnutva*, *Artava naasha*.

MATERIALS AND METHODS:

Present work is done based on critical review of classical information, published research works, modern literature. The possible correlation is made between collected information and has been presented in a systematic way.

DISCUSSION:

Garbhashaya as moolasthan:

Women possesses one extra 8th *Ashaya* ie *Garbhashaya* , which is present between *Pittashaya* and *Pakvashaya*. The word meaning of *Garbhashaya* is *Garbha + Ashaya* Organ that holds *Garbha*. As per Acharya Sushruta the position of *Garbhashaya* is in the third whorl of *yoni* and its shape is like *rohitmatsya*. Acharya Dalhana says – '*Alpamukhi antaha maha susheeramiyarthah*' ie, the opening is narrow and cavity is very large.¹⁰

By looking at these explanations we can consider it as Uterus which has similar functional anatomy and physiology. Human uterus is a pear shaped organ located within the pelvic region immediately behind the urinary bladder. It is covered by sheet like fold of peritoneum ie the broad ligament. Parts of which are Fundus, Body, Cervix, Cervical canal.

Endometrial of uterus is the main reservoir of the *Artava* ie Menstrual blood. During the menstrual cycle proliferation of the endometrium occurs and the blood supply increases. Changes in the endometrium occurs in 3 phases by the action of various hormones viz. Menstrual phase , Proliferative phase, Secretory phase.

Artavavahi dhamanis as moolasthan:

The *nirukti* of *Dhamani* is stated as "*Dhamanyat Anilapuranath Dhamani*" i.e. that which is pulsating and by this means it is filling the *Vata* into it. According to Charaka, '*Dhmanat Dhamanyaha*'¹¹ which also having the similar description as pulsating. Acharya Sushruta have mentioned these *Artavavahi Dhamanis*

under *Adhogami Dhamanis*.¹² Acharya Charaka have mentioned as *Retovaha sira*. As per Acharya Vagbhata the *Adhogami dhamanis* carry Artava in *stree* and same will carry *shukra* in *purusha*.¹³

Hence by interpreting the meaning of *Artavavahi dhamani* as tubular structures related with female reproductive system can be taken into consideration.

Uterine arteries - Main blood vessels that supply the uterus which is the branch of internal iliac artery. It has its important role in altering endometrium during the menstruation, and pregnancy. At the level of isthmus, it is divided into ascending and descending branches. Ascending branch gets anastomosed with ovarian artery, Descending branch Supplies uterine cervix and vagina.

Arcuate artery - Supplies to myometrium and anterior and posterior walls of uterus and terminates into spiral artery.

Spiral artery - Supplies endometrium and decidua (placenta during pregnancy). Rhythmic contractions and relaxations of these arteries helps to maintain the endometrial stability. Usually demonstrated in the late luteal phase before the beginning of menses.

Ovarian arteries - These are the paired structures that arise from Abdominal Aorta . Travels within the suspensory ligament of the ovary and enters the mesovarium. Ovarian arteries in females corresponds to the testicular artery in males, which courses through the abdominal wall to the external scrotum. Concept of *Adhogami siras* by *Ashtanga sangraha* holds good here.

Fallopian tubes - *Artava vaha dhamani* can also be taken as Fallopian tube which conducts *Artava* (ovum) towards uterus. As '*dhamana*' word refers to the contraction, conduction of ovum through fallopian tube can be considered here. The luminal cells of fallopian tube have cilia, by the movement of these Cilia ovum is directed from ovary to the uterus. Disruption of the ciliary movement causes reduction of the transport capacity of fallopian tube which results in infertility ie '*vandhyatva*' which is one among the *viddha lakshanas* of *Artavavaha srotas*.

Cervix and Vaginal canal - It is an elastic, muscular canal which extends from vestibule to the cervix. The smooth muscular layer within the vaginal canal has a weak contractive force which creates pressure inside the lumen of vagina during the expulsion of menstrual blood, Strong contractions are seen during the child birth due to the action of oxytocin hormone.

HPO Axis : ¹⁴

1.Hypothalamus:The HPO axis begins with the hypothalamus, Pre-optic nucleus and Arcuate nucleus that secrete GnRH. GnRH acts on the pituitary gland to stimulate the release of gonadotropins.

2.Pituitary gland: the pituitary gland responds to GnRH by releasing two key gonadotropins: follicle-stimulating hormone (FSH) and luteinizing hormone (LH).

3.Ovaries: FSH and LH travel through the bloodstream to the ovaries. In the ovaries, FSH stimulates the development of follicles (containing eggs) and the production of oestrogen. LH triggers ovulation, the release of a mature egg from the follicle.

4.Estrogen and Progesterone production: the ovaries produce oestrogen, primarily by the developing follicles, and later by the corpus luteum after ovulation. Oestrogen plays a crucial role in the menstrual cycle, influencing the thickening of the uterine lining. After ovulation, the ruptured follicle transforms into the corpus luteum, producing progesterone. Progesterone prepares the uterus for potential pregnancy and helps maintain the uterine lining.

5.Menstrual cycle phases: The HPO axis orchestrates the menstrual cycle, which typically consists of the follicular phase (prior to ovulation) and the luteal phase (after ovulation). The dynamic interplay of hormones in response to the HPO axis regulates ovulation, menstrual flow, and the preparation of the uterus for pregnancy.

6.Feedback mechanism: The HPO axis operates under a feedback system, where rising levels of oestrogen and progesterone feed back to the hypothalamus and pituitary. Negative feedback helps regulate the release of GnRH, FSH, and LH, maintaining a delicate hormonal balance throughout the menstrual cycle.

7.Pregnancy and HPO Axis: If pregnancy occurs, the developing embryo signals the continuation of progesterone production to support the early stages of pregnancy. The HPO axis adapts to the unique hormonal requirements of pregnancy, and additional hormones like human chorionic gonadotropin (hCG) play a role in maintaining pregnancy.

Understanding the HPO axis is crucial in comprehending female reproductive physiology, fertility, and addressing conditions related to menstrual irregularities or infertility. It is a complex system that plays a central role in the regulation of the female reproductive system.

INTERPRETATION WITH HPO AXIS: On reviewing all the references, we can conclude that *Artava* may behave like *Dhatu* or an *Upadhatu* at different time since reproductive physiology in female is undergoing periodical changes regularly.

To consider *Artava* as '*dhatu*' it should support and nourish the body at certain aspect. When we see the functions of *artava* during Adolescence, pregnancy and lactation, it holds good under the definition of *dhatu* as well.

At puberty accumulation of *Artava* in the uterus promotes growth and development of breasts and hair on pubic region during adolescence.¹⁵ During pregnancy *Artava* plays an important role in the *Apara nirmana* (placenta),¹⁶ and is responsible for the growth and nourishment of the breast /mammary glands.¹⁷ As all these functions are carried out under the influence of reproductive hormones, HPO Axis can also be considered under *Artava vaha srotas*.

INTERPRETATION WITH VIDDDHA LAKSHANAS:

As per Acharya Sushruta the injury to these *Artava vaha srotas* will cause *vandhyatva*, *Maithuna asahishnuta*, and *artava naasha*. If we see the applied aspects of female reproductive system, the diseases like Infertility, Dyspareunia, Amenorrhoea includes the structural and functional anomalies of these organs. So that it becomes clear that all the organs of female reproductive systems comes under *artava vaha srotas*.

CONCLUSION

Moola of *Artavavaha Srotas* is mentioned as *Garbhashaya* and *Artava vaha dhamanis*. According to Acharya Sushruta the position of *Garbhashaya* is in the third whorl of yoni (vagina) and its shape is like *rohitmatsya mukha*. Acharya Dalhana says that the opening is narrow and cavity is very large in shape. By these descriptions *Garbhashaya* is the uterus or womb which is the reservoir of *Artava* (menstrual blood) in the endometrium till the date of menstruation.

Also the *Artava* formation is under the influence of the oestrogen and FSH. The HPO Axis which secretes these reproductive hormones also the part of *Artava vaha srotas*. When menstruation occurs the flow of *Artava* is through uterine cavity towards the cervix and vagina. Here uterine cavity, cervix and vagina are also the *Artava vaha damanis* (passage) which are the *moola* of *Artava-vaha srotas*. The injury to any part of *Artava vaha Srotas* may result in conditions like infertility, Amenorrhea and dyspareunia, which are nothing but the *viddha lakshanas* mentioned by Acharya Sushruta ie due to any injury of uterus, uterine tubes, vaginal wall, cervix and their surrounding viscera as well. Hereby we can conclude that *Artava vaha Srotas* is the whole female reproductive system including HPO Axis.

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