REVIEW OF LITERATURE
THE FEMALE REPRODUCTIVE ORGANS

The whole body grows, develops and gets differentiated from a single cell, the zygote and in the process of development different organs and systems become mature at different ages and thus the body attains the complete maturity usually at the age of 16 years in female and at 25 years in male, when both of them are capable to initiate in the process of reproduction.

Thus the organs of reproduction are the last to develop and get differentiated in the process of growth and development. Considerable differences are there in the reproductive organs of a child with that of an adult woman. Even the genital organs undergo periodical cyclic changes during the active period of reproduction and once the menopause sets in, regressive changes take place in the genital organs. Thus, the necessity arises to study and understand the anatomical and physiological changes during these periods, as this has a special bearing on the etiology of various gynecological disorders. A short sketch of review is given below to understand these changes.

The female reproductive organs are divided into:

1. External genitalia
2. Internal genitalia

1. EXTERNAL GENITALIA:

The external genitalia are known collectively as the vulva. Which consists of,

- Mons pubis
- Labia majora
- Labia minora
- Clitoris
- Vestibule
- External urinary meatus
- Hymen
- Greater vestibular glands
- Perineum
The mons pubis, a pad of fat lying in front of symphysis pubis. This area becomes covered with hair at puberty.

The labia majora are two thick folds which form the sides of the vulva. They are composed of skin, fibrous tissue and fat and contain large numbers of sebaceous glands. Anteriorly the folds join in front of the symphysis pubis and posteriorly they merge with the skin of the perineum. The labia majora are about 7.5 cm. (3 inches) in length.

The labia minora are two smaller folds of skin between the labia majora containing numerous sebaceous glands. Posteriorly they fuse to form the fourchette.

The clitoris is a small erectile body which corresponds with the penis of the male. It is situated anteriorly in the vestibule.

The vestibule is limited on either side by the labial folds and leads to the vagina. The urethra also opens into the vestibule in front of the vagina just below the clitoris.

The hymen is a thin layer of mucous membrane which is perforated centrally to allow the menstrual discharge to drain away. It is placed at the orifice of the vagina, thus separating the external and internal genitals. The greater vestibular glands (Bartholin's glands) lie in the labia majora, one on each side near the vaginal opening. They are about the size of a small pea and have ducts, opening into the vestibule. They secrete mucus that keeps the vulva moist.

The perineum is the area extending from the fourchette to the anal canal. It is roughly triangular in shape and consists of connective tissue, muscle and fat. It gives attachment to the muscles of the pelvic floor.
2. INTERNAL GENITALIA: -

The internal organs of the female reproductive system lie in the pelvic cavity and consist of vagina, uterus, two uterine tubes and two ovaries.

VAGINA: -

The vagina is a fibromuscular tube lined with stratified epithelium, connecting the external and internal organs of reproduction. The lower end of the vagina lies at the level of the hymen and of the introitus vaginae. It is surrounded at this point by the erectile tissue of the bulb which correspond to the corpus spongiosum of the male. The direction of the vagina is approximately parallel to the plane of the brim of the true pelvis; the vagina is slightly curved forward from above downwards and it's anterior and posterior walls lie in close contact. It is not of uniform caliber, being nearly twice as capacious in it's upper part and somewhat flask shaped. The vaginal portion of the cervix projects into it's upper end and leads to the formation of anterior, posterior and lateral fornices. The depth of the fornices depends upon the development of the portio vaginalis of the cervix. In girls before puberty and in elderly woman in whom the uterus has undergone postmenopausal atrophy, the fornices are shallow, while it is deep in women with congenital elongation of the portio vaginalis of the cervix.

The vagina has an outer covering of areolar tissue, a middle layer of smooth muscle and an inner lining of stratified squamous epithelium. It has no secretary glands but the surface is kept moist by cervical secretions.

UTERUS: -

The uterus is a hollow muscular pear shaped organ, flattened anteroposteriorly. It lies in the pelvic cavity between the urinary bladder and the rectum in an anteverted anteflexed position. It is about 7.5 cm
long, 5 cm. wide and its walls are about 2.5 cm. thick. It weighs from 30 to 40 grams. The parts of the uterus are fundus, body and cervix.

The fundus is the dome shaped part of the uterus above the openings of the uterine tubes.

The body is the main part. It is narrowest inferiorly at the internal os where it is continuous with the cervix.

The cervix protrudes through the anterior wall of the vagina, opening into the external os.

The walls of the uterus are composed of three layers of tissues, perimetrium, myometrium and endometrium.

**Perimetrium:**

The peritoneal covering of the uterus is incomplete. Anteriorly the whole of the body of the uterus is covered with peritoneum. The peritoneum is reflected on the bladder at the level of the internal os. The cervix of the uterus has therefore no peritoneal covering anteriorly. Posteriorly the whole of the body of the uterus is covered by peritoneum, as is the supravaginal portion of the cervix. The peritoneum is reflected from the supravaginal portion of the cervix onto the posterior vaginal wall in the region of the posterior fornix. The peritoneal layer is incomplete laterally because of the insertion of the fallopian tubes, the round and ovarian ligaments into the uterus, and below this level the two sheets of peritoneum which constitute the broad ligament, leave a thin bare area laterally on each side.

**Myometrium:**

Myometrium is formed by bundles of smooth muscle fibres separated by fibrous tissue, through which the blood vessels, nerves and lymphatics
run. The musculature is arranged in three layers especially being well developed during pregnancy.

Outer longitudinal layer is the thin layer running hood-like from anterior to backwards over the fundus and stops at the level of internal os and does not cover the sides of the uterus where blood vessels enter. It converges at the uterine cornua on each side of the uterus to be continued on the fallopian tube and round ligament.

Middle vascular layer forms the main bulk of the uterine wall. The muscle fibres are angled like figure of eight around the vessels and thus act as ‘physiological living ligatures’ to the myometrial vessels during their contractions.

Inner circular layer is present at all levels but chiefly developed at tubal ostia and the internal os.

**Endometrium:**

The endometrium is the inner layer of the uterus, which is the mucous membrane lining of the cavity. This layer consists of two zones, a superficial functional layer consisting of epithelial and an intermediate layer. Second one is the deep basal layer in between the functional and the inner layer of myometrium. The functional layer is columnar epithelial cells which undergo various cyclic changes during a menstrual period by the influence of ovarian hormones.

**UTERINE TUBES** (Fallopian tubes)

The uterine tubes are about 10 cm long and extend from the uterus between the body and the fundus. They lie in the upper free border of the broad ligament and their trumpet-shaped lateral ends penetrate the
posterior wall, opening into the cavity close to the ovaries. The end of each tube has finger like projections called fimbriae. The longest of these is the ovarian fimbria which is in close association with the ovary.

The uterine tubes have one outer covering of peritoneum (broad ligament), a middle layer of smooth muscle and are lined with ciliated epithelium.

The uterine tubes convey the ovum from the ovary to the uterus by peristalsis and ciliary movement. The mucus secreted by the lining membrane provides ideal conditions for movement of ova and spermatozoa. Fertilization of the ovum usually takes place in the uterine tube then the zygote moves into uterus.

OVARIES

The ovaries are the female gonads or sex glands, and they lie in a shallow fossa on the lateral walls of the pelvis. Each is attached to the upper part of the uterus by the ligament of the ovary and to the back of the broad ligament by a broad band of tissue, the mesovarium. Blood vessels and nerves pass to the ovary in the mesovarium. They are 2.5 to 3.5 cm. long and 2cm. wide and 1cm. thick.

The ovaries have two layers of tissue. The medulla lies in the centre and consists of fibrous tissue, blood vessels and nerves.

The cortex surrounds the medulla. It has a framework of connective tissue or stroma, covered by germinal epithelium. It contains ovarian follicles, each of which contains an ovum. Before puberty the ovaries are inactive but the stroma already contains immature (primordial) follicles. During the childbearing years one ovarian follicle matures, ruptures and releases its ovum into the peritoneal cavity during each menstrual cycle.
Maturation of the follicle is stimulated by follicle stimulating hormone (FSH) from the anterior pituitary. While maturing, the follicle lining cells produce the hormone oestrogen. After the follicle lining cells develop into the corpus luteum (yellow body), under influence of the luteinising hormone (LH) from the anterior pituitary. The corpus luteum produces the hormone progesterone. If the ovum is fertilized it embeds in the wall of the uterus where it grows and develops and produces chorionic gonadotrophic hormone which stimulates the corpus luteum to continue secreting progesterone for the first 3 months of pregnancy. If the ovum is not fertilized the corpus luteum degenerates, menstruation occurs and the next cycle begins. Sometimes more than one follicle matures at a time, releasing two or more ova in the same cycle. When this happens and the ova are fertilized the result is a multiple pregnancy.

AYURVEDIC CONCEPT OF FEMALE REPRODUCTIVE ORGANS: -

It becomes a difficult task to collect and correlate the matter available about anato-physiology of female reproductive system described in Ayurvedic textbooks with that of modern medical literature. However, an effort is put forth to study and compile such related references and to understand them, in the light of some modern scientific parameters wherever possible.

There is no classification of female genital organs available in Ayurvedic texts like that of modern books. In Ayurvedic classics almost all the organs of genital system as a whole and also to individual organs are described under the word “Yoni” which is referred to as a conch shell shaped structure with three divergent axis (Avarta)1 (S.Sa 5/55). These three are not clear in appearance but it is however mentioned that in the last one or the third avarta is the ‘Garbhashaya’ (The bed for foetus). On the basis of this, it can be compared with uterus. Thus the axis of vagina
directing downwards and forwards, the anteverted isthmus with the cervix directing backwards and downwards, and the anteflexed uterus with a backward axis give a circular conch shell like appearance.

In the same context, one more term often used "Apatyapatha". i.e. foetal pathway. This word can directly be attributed to vaginal canal or the first avara (compartment) of yoni. The foetus at the time of confinement comes through this way.

Acharya Kasyapa in chapter of "Garbhavakranti" refers the word 'vipulasrotas' (K.S. Garbhavakranti) for "Garbhasaya" for it is bounded by Jara (probably the broad ligaments and the fold of visceral peritoneum). In addition this garbhasaya is said to be placed in "Kundala" which may logically be compared to the pelvic cavity.

Acharya Sushruta has described the ovaries under the chapter of "Sarir Sankhya" and said that the muscles or peshies associated with the penis and testes in male lie in association of ovaries in females (Phalamantargata), (S.Sa 5/53)

M.M. Gananathsenjee also gave the commentary that as the extra peshis in female have already been described for yonimukha, garbhashaya and stana (Mammary glands) the word "phalamantargata" is to be used for ovaries. Thus the testes and penis in male are compared with ovaries and clitoris in female.

The ovaries are described as marmasthana in females in a similar way as testes in males (S.Chi 7/37-38). It is a well known and common fact that the pain experienced in testes and ovaries when they are pressed.

Some references for fallopian tubes are also found in Ayurvedic text books. The dhamanis described for conduction & excretion of sukra in
male (S.Sa. 9/6) are said to function for Artava in a similar way in a female.

However, it is wise to understand Artavavaha shrotas as fallopian tubes, when cut are said to produce sterility, dyspareunia and artavanasha (S.Sa. 9/22).

Thus it is seen that, in Ayurveda all the female reproductive organs have been included under the word “Yoni” (vagina, cervix and uterus). The Apatyapatha and vipula srotas or the garbhashaya with rohitamatsya mukha giving the inference of vaginal canal, uterus and cervix.

**CHANGES IN GENITAL ORGANS:**

As a general rule, the stages of life is divided into three age groups, the child-hood, adolescence and senility, during which some specific feminine changes occur in a woman. These three phases of life can be taken as,

1. Birth to menarche (pre-pubertal)

2. After attainment of puberty upto menopause (Reproductive age).

3. Menopause to death (Post menopausal age)

In terms of Ayurveda, these age groups can be considered as “balya”, “Madhya” and “vridhavastha”. Later they have been further divided into some sub-groups.

A comprehensive study of this classification is being submitted here:

In balyavastha a girl up to 8 years is called ‘Gauri’, between 9 to 10 years she is ‘Rohini’ and after 10 years upto the time of menarche she is known as ‘Kanya’. The time when she attains menarche she is called ‘Rajaswala’
and therefore she is taken as 'Bala' until she reaches her 16th years of age or full maturity (Manusmriti).

'Vriddhavasrtha' is the post menopausal age. No sub-division is seen in this age group.

The child is delicate, unable to tolerate strain and stress with poor resistance as the tissues are immature (C.S. Vi. 8/121). Until 25th in male and 16th in female the body continues to grow and develop with differentiation of various tissues and organs so as to become a completely mature at this age (A.S.Chi 11/4). Though physiologically the woman gets prepared for reproduction with the onset of menstruation at the age of 12 years, still her tissues and organs are not completely mature and if at all she conceives before the age of 16th year, she may fail to nurture the developing embryo resulting in either abortion or a weak child (S.Sa 10/54-55 Baktabya, Ghanekar).

The presence of fragrance and fruit in a bud in a latent state unperceivable by the sense organs, the hormone responsible for rajas and stanya remain in a very minute quantity or in a latent form and become seen only when the person attains puberty like the blossom in the flower. Thus the woman becomes pushpeekrita and blossoms at full maturity (K.S. Jatisutriya and A.S. Sa. 1/21).

Acharya Kashyapa, the pioneer of obstetrics and gynaecology, says that Artava is generally not manifested in balyavastha because it circulates all over the body up to that age and she is considered "Heen Yoni" (K.S. Khilasthana). Here the term "Heen Yoni" may be attributed to underdeveloped genitalia and once with full growth and maturity this Artava starts coming towards Yoni and gets manifested. In this context, the term Artava not only implies to the menstrual blood but indirectly it gives us to think about female sex hormones also. So there are no vaginal discharges described during this Balyavastha. According to textual...
references, the secondary sex changes like development of breast, uterus and vagina appearing in a girl during early menarche is a consequence of accumulation of raja.\textsuperscript{13} (S.Sa 3/7-8 Vaktabya Ghanekar)

The latent properties of Artava in female are compared to the effects of sex hormones of modern literature because they also believe that these hormones help the skeletal growth, cause anabolic effect in the body with deposition of fat in breast, buttocks and thighs during adolescence, when she arrive at the age of 12 years menarche starts resulting from gradual increasing of hormones.

In Vriddhavastha or with the onset of menopause again all the dhatus and upadhatus in the body undergo degeneration and menstruation also gradually ceases, the body becomes weak with wrinkled skin and the uterus, ovary and other reproductive organs undergo atrophy. The woman is unable to remain fertile and all the indriyas also become weak similar to an old tree\textsuperscript{14}. (A.S.Sa. 8/24)

**PHYSIOLOGICAL AND PSYCHOLOGICAL CHANGES DURING REPRODUCTIVE AGE:**

Madhyavastha is the age group between the 16\textsuperscript{th} year until menopause sets in, usually upto the 50\textsuperscript{th} year. This time span is also subdivided into two groups. First one is 16\textsuperscript{th} to 32\textsuperscript{nd} year when a woman is considered Taruni and then till menopause she remains in a "Adhirudha". \textsuperscript{15} (B.P.Pu.k.)

After the 16\textsuperscript{th} year a woman gets completely a feminine figure, all the tissues and organs get matured and now she is able to reproduce. So, this period is compared with reproductive age. At this time many physiological changes occur.
When she gets twelve years the menstrual cycle may start. Various changes take place in external and internal genital organs which are already described but these changes become more evident after 16 years of age. Apart from the feminine changes the woman, during the reproductive period undergoes cyclic physiological changes every month.
CONCEPT OF MENSTRUATION

Menstruation is a normal physiological process indicating womanhood. It is a cyclical process and repeats every month. In modern text books a detailed description may be found but the exact mechanism behind the process is yet to be explained. The function or purpose of menstrual bleeding is not clearly understood. Experimentally, it has been observed that if the hormone level is decreased very gradually, regression can be made to occur as slowly as growth and menstruation will not take place. From all these points, menstruation becomes an important physiological manifestation in a woman's life. Hence, it is necessary to collect the concept of menstruation as described in various sciences. Before going through the detailed description of menstruation, it is necessary to consider a little about the terminology used in the old texts.

ARTAVA

ऋतौ भवमात्वम् (A.H.Su.1/1 Arundutta tika)

'Ritu' means particular period or specific time and 'Bhavam' means to occur. Thus the whole term indicates that Artava is a substance of the body which flow out in and on a specific period of time or 'Ritu'. Artava being a red coloured fluid is denoted by the word Rakta or sonita, and is found as an upadhatu of Rasadhatu only in females. Its confirmation can be done by "Streedharma Sucakam mala rupa rudhiram Rajah".

The word "Streedharma" indicates that a woman becomes able to perform her main function of reproduction, only after the starting of regular menstrual period containing Antah puspa (ovam). Here the flow of blood per vagina every month is indicated by "Mala rupa rudhiram". Certain words have been used to describe "Artava". Raja, Rudhira, Puspa, Rakta, Sonita, Asrk, Lohita.
Menstruation is the visible manifestation of cyclic physiological uterine bleeding out of Shedding of endometrium due to invisible interplay of hormones mainly through the hypothalamo-pituitary ovarian axis. For the menstruation to occur the axis must be actively in co-ordinated; endometrium must be responsible to overall hormones- oestrogen and progesterone and the outflow tract must be patent.

It represents the breaking down and casting off or an endometrium prepared for a pregnancy which does not materialize and so is described as “Weeping of a disappoint uterus”.

**Artavadarsana Kala (Menarche): -**

In Brihatrayee and Laghutrayee the description regarding the same is available and there is no controversy regarding time of first Artavadarsana. All Acharyas have mentioned twelve years as age of Menarche. Kasyapa mentions the age as 16 years which is probably the description of appropriate age for conception. He further says that this age can be influenced by specific Ahara (dietetics) and Arogya (Health). The modern texts depicts that the menstruation occurs between 11 to 15 years with a mean of 13 years. It is more closely related to bone age than to chronological age. For the past couple of decades, the age of menarche is gradually declining with improvement of nutrition and environmental condition.

**Suddha Artava Laksana: -**

(Characteristics of normal menstrual discharge)

The discharge is red in colour, similar to colour of Rabbits blood, liquid lakha, fruits namely Gunja, a small creature namely Indragopa (which is a port wine coloured creature). Some authorities described the colour as slightly blackish. The commentators explain that this blackish red tinge is
of the out coming discharge. This discharge has a typical odour and it does not stain the cloths.\textsuperscript{17}

In the modern text the menstrual flow is said to begin as pink discharge consisting of cervical mucous and blood, and is rich in leukocytes. It is heavier on second and third days when it is dark red in colour. Thus, it can be inferred that in normal conditions Artava should be slight blackish in colour. The amount of discharge is 4 anjali\textsuperscript{18} (Acc. to Susruta).

Quantity\textsuperscript{12} 4 Anjalis – Vabhatta, Bhavaprakasa. There are different notions about the amount. Acharya Caraka has not mentioned any specific amount, stating only that -

"Naivati bahul na.ati alpam suddham adiset" due to Variation in Desa, Kala, Ahara, Vihara and prakrti etc. (Ch. Ch. 30 – 225)

The same is written in the modern text that the total loss of blood is difficult to estimate but is said normally to vary from 50 to 60 or 80 ml. With an average of 35 to 45 ml. This is equivalent to an average daily loss of 0.6 to 0.7 Iron throughout each month.

Duration of Menstrual flow.\textsuperscript{19} according to different Acharya are as follows: -

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<tr>
<th>Duration</th>
<th>Acharya</th>
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<tr>
<td>3 days</td>
<td>Bhava Prakasa</td>
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<tr>
<td>3 nights</td>
<td>Vagbhatta</td>
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<tr>
<td>5 nights</td>
<td>Caraka</td>
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<tr>
<td>7 days</td>
<td>Harita and Bhela.</td>
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**Ritu chakra kala** (Length of the menstrual cycle): \textsuperscript{20}

Ritu cakra Kala has been given as 1 month by all Acharyas:
Masat – Charaka, Susruta, Vagbhatta etc.
Dharma Sastras :) 21 days.
Composition of menstrual blood: -\(^{21}\)

According to Ayurvedic classics, Artava comprises of pancamahabhuta Angneya Mahabhuta being the prominent among the five mahabhutas, there is visrata (Amagandhita) due to prthvi mahabhuta and Dravata (liquidity) due to Jala mahabhuta, Spandana due to Vayu Mahabhuta and Laghuta due to Akasa Mahabhuta.

The modern texts describe that the menstrual discharge consists of dark altered blood mixed with mucous secretion from cervical canal and with the normal vaginal secretion, endometrial debris, bacteria and rich in leukocytes. Small shreds of necrotic tissues can sometimes be identified.

Artava Utpatti: -

For the whole month, the blood is collected by both the Dhamanis assuming slight blackish colour and specific odour is brought to the vaginal orifice for expulsion. \(^{22}\) Upadhatus are those substances in the body which are the constituents of the body but having no qualities to generate other Dhatu. Artava has been described as upadhatu of Rasa. Bhavamisra, while explaining the formation of Dhatu writes that women possess one extra dhatu just as presence of one extra Asaya (Garbhasaya), thus have Artava as seventh and Sukra as eight Dhatu.\(^{23}\) There appear to exist some difference of opinion regarding formation of Raja. Susruta, Vagbhatta II, Dalhana and Cakrapani opine that it is formed from Rasa, while Vagbhatta I says it is formed from Rakta, actually both these descriptions are identical, because Rakta either Dhatu rupa or menstrual blood is always derived from Rasa, thus it appears that Susruta etc. have pointed to the earlier stage of Raja formation, while Vagbhatta I to the later stage.\(^{24}\)

The point has been clarified by Cakrapani that during the process of formation the Artava is Saumya due to influence of Rasa, while at the time
of its excretion due to specific charges it assumes Agneya Character. This alteration is brought due to change in Character caused by Dosas in the same way as solid substances are changed into fume due to action of fire, cane juice a vitiating factor of kapha is changed after fermentation into wine which vitiates all the three cosas.

The main function of Rasa is to provide nourishment to the whole body. Artava performs only Dharana and Posana karmas, for the female genital organs and foetus. There are some explanations about the genesis of upadhatus in the samhitas as well as in Commentaries there upon. The Ahara Rasa is the only source of production of Dhatus and upadhatus. The same has been intimated in Dalhana commentary. Thus the Artava being an upadhatu is related positively with the Ahara Rasa but the Ahara as itself is not converted into Upadhatu directly but it has to pass through some other metabolic processes caused by the Jatharagni, Dhatvagni and Upadhatvagni, then only it is able to provide the nourishment to Upadhatu. While describing the process of formation of Dhatu and Upadhatu, Sarngadhara has imparted that due to action of Paka of Pitta upon the Rasa, the Dhatu and the Upadhatu are formed respectively. As believed by Acharya Kasyapa, the blood in adult female during their reproductive period enters into Garbha Kostha every month and there are Rajovaha siras in the uterus which are the carriers of Artava formed by the action of Artavagni upon the Rakta and they fill the uterus in one month and after that this Artava is expelled out by these Siras at the interval of 1 month in case of females only. Rasa is successively transformed into each of the six remaining fundamental tissues of the body in continuation in shape of each Dhatu for the period of 3015 kalas. Thus the Rasa is converted into semen in men and menstrual blood in women in course of a month. The cause of menstruation is still obscure, but the sequence of events have been given in endometrial cycle.
Menstrual Cycle: -

In Ayurvedic classics Rtukala and Rtu Cakra have been described. The period of Rtu Cakra is one month.\textsuperscript{29}
Entire gross period of one month (Candra masa 28 days) is divided into three i.e.: -

- Raja Srava: 3 to 5 days.
- Rtu Kala: 12 to 16 days.
- Rtu Vyatita Kala: 9 to 13 days.

The normal reproductive years of the female are characterized by monthly rhythmic change in the rates of secretion of female hormones and corresponding changes in the sexual organs themselves.
Normal menstrual cycle entails periodic anabolic and catabolic processes that occur synchronously in the uterus and ovary.
The cyclical changes in the endometrium are governed entirely by the hormones of the ovarian follicle and corpus luteum. The endometrial cycle operate through the following stages: -

- First: Proliferation of the uterine endometrium.
- Second: Secretory changes in the endometrium.
- Third: Desquamation of the endometrium known as menstruation.

Proliferative phase of the Endometrial cycle:-

At the beginning of each menstrual cycle, most of the endometrium is desquamated by the process of menstruation. This includes complete loss of the epithelium and stratum submucosum and loss of most of the stratum Vasculare. After menstruation, only a thin layer of endometrial stroma remains at the base of original endometrium, and the only epithelial cells are those located in the deep portions of glands and crypts of the endometrium under the influence of estrogens, secreted in increasing quantities by the ovaries during the first part of ovarian cycle,
Hormonal regulation of changes in the ovary and uterus
the stromal cells and the epithelial cells proliferate rapidly. The endometrial surface is re-epithelialized within 3 to 7 days after the beginning of menstruation for the 1st two weeks of the sexual cycle i.e. until ovulation, the endometrium increase greatly in thickness, owing to increasing number of stromal cells and to progressive growth of the endometrial glands and blood vessels into the endometrium, all of which effects are promoted by the oestrogens. At the time of ovulation the endometrium is approximately 2 to 3 mm. thick.

**Secretory phase of the Endometrial cycle:**

It begins at approximately the 14th day of cycle or just before ovulation. During this phase endometrium continues to grow to reach a maximum thickness of about 8 – 10 mm. During this phase oestrogen is secreted in large quantity by the corpus luteum. The oestrogen causes additional cellular proliferation in the endometrium during this phase of endometrial cycle, and progesterone causes considerable swelling and secretory development of the endometrium. The glands increasing in tortusity, Secretory substances accumulates in the glandular epithelial cells and the glands secrete small quantities of endometrial fluid. Also, the cytoplasm of the stromal cells increases lipid and glycogen deposits increase greatly in the stromal cells, and the blood supply to the endometrium further increases in proportion to the developing secretory activity, the blood vessels becoming highly tortuous. The thickness of the endometrium approximately doubles during the secretory phase, so that towards the end of the monthly cycle the endometrium has a thickness of 4 to 6 mm.

The whole purpose of all these endometrial changes is to produce a highly secretory endometrium containing large amounts of stored nutrients that can provide appropriate environment for implantation of a fertilized ovum. During the later half of the monthly cycle, from the time of fertilization first takes place until the ovum implants, the fallopian and uterine secretion called "uterine milk" provide nutrition for the early
dividing ovum. Then, once the ovum implants in the endometrium, the trophoblastic cells on the surface of the blastocyst begin to digest the endometrium and to absorb the substances digested, thus making still for greater quantities of nutrients available to early embryo.

**Menstruation:**

Approximately two days before the end of the monthly cycle, the ovarian hormones, oestrogens and progesterone decrease sharply to low levels of secretion and menstruation follows. Menstruation is caused by the sudden reduction in both progesterone and estrogens at the end of the monthly ovarian cycle. The first effect is decreased stimulation of the endometrial cells by these two hormones, followed rapidly by involution of the endometrium itself to about 65% of its previous thickness. During the 24 hours preceding the onset of menstruation, the tortuous blood vessels leading to the mucosal layer of the endometrium become vasospastic, presumably because of some effect of the involution, such as release of a vasoconstrictor material, or perhaps because of Kapha Dosas. As excretory function is of Apana Vayu, so during the bleeding phase of the menstrual cycle, the dominance is of Vata Dosa. Kapha has been attributed the constructive work, Upacaya, thus in proliferative phase the Kapha Dosa will be prominent and during the secretory phase the Pitta Dosa will be prominent in action. Pitta Dosa by its Usna guna and parinama karma come into play i.e. change of Rasa into Rakta, during the secretory phase of menstrual cycle. The progesterone and oestrogen may be produced due to Pitta and Vata Dosa. Since all the locomotor system reflex action and to carry stimulus from one organ to another is under the control of Vata Dosa, the stimulus which occurs from hypothalamus to pituitary to ovary and ovary to uterus can be correlated with the action of Vata Dosa. i.e. Hypothalamus pituitary ovario uterine reflex. This reflex is working through all the three stages of the menstrual cycle, naturally the Vata Dosa is coming into play through all these three phases of menstrual
cycle working by it's karma i.e. stimulating action "Pravartako Cestanam". During the bleeding phase, the Vata Dosa works through it's Cala Guna and Ksepana Karma and Pitta Dosa works through it's Drava and Sara guna. During the resting phase of the menstrual cycle, the Kapha Dosa by its fusing nature and slesakara karma, repairs the superficial and intermediate layer of the endometrium and makes them able to proliferate along with the action of Vata Dosa (Sandhanakara Karma). During the secretory phase of the menstrual cycle, the Pitta Dosa dominates by performing its action due to Usna guna and Pankti Karma i.e. to make graffian follicles in maturing stage and thereby after ovulation, the production of oestrogen and progesterone.

There is one quotation in Charaka Samhita, which includes the whole phenomena of the menstrual cycle. In fact, the first half of the quotation refers to the bleeding and proliferation phase "Gate purane Rajasi" while the second half "Nave Ca Avasthite" 30 refers to secretory phase of menstrual cycle.

**Importance of Suddha Artava: -**

Rakta Laksanam Artava Garbha Kritam Ca." 31 in this quotation the word "Rakta Laksanam" means Suddhartava. In short we can say that fertilization process alongwith growth and development of foetus is related to Suddhartava. Dalhana has mentioned that Rajodharma is very important to save the woman from any disease like Prameha32 etc. In other words, Rajodharma is one type of purification process for a lady and by this the genital tract of a female gets purified. Some texts reveal that, if a menstruating woman spits on a flower, the flower will get withered off. All these may have scientific basis but at present they are unexplainable. According to the modern science, a menotoxin or poisonous substance comes out through the female genital tract during the menses, which may be responsible for withering of flowers.
Thus, in nutshell Suddha Artava Pravrtti in terms of proper regular menstruation in a woman is an indication of her health while Artava nivrtti (Stoppage of Menses – menopause) is one such indication for Vaikarikavastha (disorder).
So, it is obvious to have an all-round knowledge of Rajonivrtti before discussing the knowledge of the Artava becomes compulsory.

HORMONES: -

The ovarian hormones play main role in female life span. As in first stage it helps to have a feminine structure and in the second stage the proper functions of this helps to have a healthy progeny and in the third stage due to the aging ovary reducing these hormones will gradually leads to disturbance of body function. And finally cessation of the ovarian functions will take place and start aging with menopausal syndrome. Hence, the description of ovarian hormones is considered as integral part of this study.

Ovarian Hormones: -

The oestrogen and progesterone are the products of the ovary. The reproductive systems of both the female and male are fully dependent on the hormones for their differentiation and full development.
Polypeptide hormone: - Hypothalamic decapetide gonadotrophin releasing hormones are the polypeptide hormones. These act on the adenohypophysial cells which synthesize and release FSH and LH.
Steroid Hormones: -

The ovary and the adrenal cortex secrete lipid soluble compounds called steroids. The basic steroid in the body is cholesterol, which is perhydrocyclopenteno phenantherene. Cholesterol is synthesized from acetates and modification of its structure produces not only oestrogen,
Progesterone, testosterone and adrenal corticosteroids but also vit-D and Bile acids.

Progesterone is secreted in large amount by the corpus luteum and placenta and much smaller amounts from the granulose cells. Androgens are formed from pregnenolone and progesterone. Physiologically active oestrogens are synthesized via androstenedione.

All the steroid hormones are chemical inerchangable and in both the ovary and the adrenal cortex are metabolized from cholesterol. In this way they are converted into progesterone, which can change to oestradial and oestrone, intermediate products being endrostenedione and testosterone.

**Oestrogen: -**

Oestrogen originates from granulose cells.

(i) Oestradiol – The most powerful products of the ovary.

(ii) Oestrone – It is less active.

Both of them are found in blood circulation. They are inactivated by the liver. But when liver function is impaired, the amount is increased and excessive menstrual bleeding can result.

**Oestradiol: -**

Origin theca cells and membrane granulose. It increases when the follicle ripens. It reaches a peak just before ovulation. Thereafter it falls when the corpus luteum degenerates the output falls sharply. And it is excreted in the urine in the form of metabolices.

**Action: -**

(1) It mainly helps in the determination of famine sensitivity and helps in secondary sexual characters.

(2) It plays a small part in determining the sexual desire.
During girlhood – before puberty, the oestrogen secretion is small to cause full development of the reproductive organs. In girls before puberty the pituitary and the hypothalamus are the dominant factors. At puberty, the sensitivity of the hypothalamus, to the negative feedback effect of oestradiol decrease and in consequence the hypothalamus secretes more gonadotrophin releasing hormone, the adenohypophysis secretes more FSH and LH and the ovaries secrete more oestadial, progesterone and androgen which together produce the changes of puberty.

In menopausal condition, the ovaries become smaller, the graffian follicles disappear and are replaced by fibrous tissue, Ova, Corpus luteum and the internal secretions of the ovary.

Oestrogens: -

The oestrogen administration promotes myotic activity in the uterine muscle and endometrium. The muscle fibres are enlarged and become more excitable and active, Oestrogen stimulates the growth of the glandular epithelium, causes hyperaemia, increases in content of water, electrolytes, nucleotides and enzymes. These increase the vaginal secretion and make it acid and protect the vagina against the bacterial infection.

Progesterone: -

It is an intermediary product in the bio-synthesis of cortisol, oestrodiol and testosterone. It is secreted into the blood stream by the corpus luteum and the placenta. The progesterone actions are –

(a) Endometrium (for Secretory phase) becomes oedematous by the influence of progesterone.
(b) Progesterone inhibits ovulation in women, probably by inhibiting the release of L.H. - releasing factor from the hypothalamus. During the pregnancy the ovulation is inhibited by progesterone at first from the corpus luteum and later from the placenta.

Progesterone raises body temperature slightly and progesterone secretion during the initial phase the ovarian cycle, probably accounts in this way for the rise in morning body temperature after the ovulation.

Relaxin is a polypeptide which has been isolated from the corpora lutea of many species and its concentration in tissues and blood increases during pregnancy. It causes relaxation of the symphysis pubis, inhibition of uterine contractibility and softening of the cervix.

HORMONAL INFLUENCE IN DIFFERENT STAGE OF FEMALE LIFE: -

Period of growth phases of activity processes of involution: These form the well delineated pattern of the female reproductive system. This is in essence the problem of ageing. Mainly the activity of the above three phases depend upon with the influence of the hormonal status of the feminine body. Hormonal influence of female body is not so intelligible and clear in Ayurvedic texts as is available in modern book. However on collecting the scattered references available here and there in the classics of Ayurvedic literature and to make an effort to correlate them with the modern science is very difficult task. As the viewpoint of modern science in changing from day to day. New discoveries come to light whereas the fundamental principle of Ayurveda are true for all times.

Climacteric stage is the last stage of a woman's reproductive era. Before discussing in details its necessary to have a thorough knowledge about the hormonal phenomena in female body according as follows: -
Childhood: -

Childhood is the period of growth during which the hormonal activity remain in silent form.

Bala : Age 10 years.

Gauri, Rohini and Kanya are subdivisions of Bala.

General development of the body is taken place in this stage.

Ancient Acharyas Vagbhatta, Kasyapa and Dalhana accept presence of Raja or Sonita from the very childhood just like Sukra, which is not visible due to very minute quantity. Menstrual blood is not accumulated anywhere in the body, rather it is formed every month in the uterus. If with this description ovum is accepted due to this presence from embryonic life then its explicitness at twelve years of age would be difficult to explain, because it is microscopic structure. This reference probably indicates description of hormones especially ovarian.

The same matter is described elaborately in modern science. According to them it is strange and hard to believe yet the newborn female provides us with an excellent example of involution within a few days after birth. The female infant subjected to the extremely high hormone levels which are constantly circulating in the maternal blood stream the last three to four months of gestation, develops a uterus and vaginal mucosa with show evidence of the extreme hormonal influence. The uterus in the newborn is usually palpable rectally, the normal 2:1 (cervix to uterus) is apparent. The vaginal mucosa is thickened, corrugated, and has a deep purplish red cast completely similar to the stimulation of the vagina in the mature female.

Within a few days after birth, girl babies may bleed slightly from the uterus. This is simply another example of estrogen withdrawal bleeding,
subsequent to the removal of the female infant from the maternal
estrogenic influence, the uterus decreases rapidly in size and is in a
year’s time, much smaller than it was at birth and can only be palpated
rectally as a very small object if at all.

The vagina also involutes in the first few days after birth, and a creamy
vaginal discharge is frequently noted in newborn female infants. This is
the result of a sloughing off of the glycogen containing, cornified elements
of the vaginal mucosa in large quantities subsequent to the withdrawal of
the mother’s oestrogen level. The vaginal changes in chemical reaction
from a pH in the region 4.5 to 7. The previously described engorged
vaginal walls become very thin pinkish in colour and the vagina sprinks in
size. The production of "Witch’s milk" in the breasts of newborn of both
sexes is another example of the widespread growth and activity stimuli of
the placental steroids. The involution phase is short with most of the milk
disappearing from the newborn breasts by the third to fourth post natal
week.

**Endocrinology of foetal life:**

In terms of hormone production the hypothalamo pituitary Ovarin axis is
active and functional from approximately 20 weeks of foetal life. Infact, the
circulatory gonadotrophin levels remain at a higher level in foetal life than
during neonatal period. The development of ovarian follicles in the foetus
depends upon the gonadotrophins released from the foetal pituitary.

**Infancy and Childhood:**

The high level of FSH and to a lesser degree of LH at birth gradually
decline and the minimum levels are achieved by two years of age. The
FSH level is highly sensitive to exogenous oestrogen.
Puberty: -

Puberty for girl is the period for her sexual maturity. Puberty usually starts at the age of 8th year and becomes complete by the 16th year.

Kumari – Mugdha Age 10 to 12 year.

Stage of Premenarche: In this stage there is development of Sex characters in female body.

Rajomati: -

Age 12 to 16 years

Stage of Menarche and established maturity. Menstruation starts and cycle is fully established and now she is capable to conceive.

Acharya Susruta accepts the development of breasts, uterus, vagina etc. during adolescence due to gradual accumulation of Raja, here Raja refers to hormones specially oestrogen.

In boys sukra appears after specific age. Similarly in girls romaraji (pubic and axillary hair) grows in specific age. Dalhana includes Artava (menstruation) and Stanya (Breast milk) also. Due to accumulation of Raja there is gradual development of Breasts, Uterus and Vagina alongwith Vulva. The yoni (reproductive system) of young girls is 'hina' under developed thus menstruation does not occur. With the natural maturity specially of Dhatus menstruation occurs.

Twelve year is the age of menarche, Kasyapa mentions the age sixteen years which is probably the description of appropriate age for conception. Arunadatta opines that this is probable age. There may be slight variation in individual cases as menarche may come at eleven year.
Modern science reflects the same matter. Adolescence means the period between puberty and maturity at 18 completed years. During this period a girl grows into mature adult woman with further sexual, psychosexual and physical maturity. A modern description of adolescence is teenager.

This period which is a link between childhood to adulthood there are profound biological, morphological changes which lead to full maturity and eventually fertility.
THE PHENOMENON OF MENOPAUSE

Creation, existence and destruction are natural phenomenon which come in an order. These situations occur in each and every person's life and one cannot avoid these conditions. Some specific stages are seen in women's life- prepuberty - Puberty, menstruation, climacteric stage and Menopause. Puberty is that stage in which a woman gets something new as capacity of reproduction. On the other hand in climacteric stage she looses something like creation of reproductive life, and this condition comes with aging process.

According to Ayurveda the Jara (Aging) is a natural phenomenon like hunger, thirst and sleep. Acarya Susruta mentions a group of naturally occurring diseases which are named as Svabhavabala pravritta, which includes Ksudha (hunger), Pipasa (Thirst), Nidra (Sleep), Jara (Aging) and Mrityu (death). Dalhana while commenting over the Svabhavabala Pravritta – means that these diseases occur due to the Power of nature. According to Cakrapani the Svabhava of a particular individual depends upon the invisible factors hereditarily carried out by the particular race in which they born. (Su.Su. 1/33).

Rajanivritti is one of the Svabhavika Prakriya indicating the change in life style of a woman, due to Jaravastha. This is natural phenomenon, but, when this stage causes a discomfort either to the mind or body, it attains Vyadhisvarupa.

DERIVATION AND DEFINITION OF THE WORD RAJONIVRITTI: -

The term “Rajanivritti” is made up of two words viz. “Raja” and “Nivritti”. The etymology of these two words are as follows.

(According to Monier Williams – Sanskrita to English dictionary).
Raja: - The word 'Rajah' has many meanings such as: -

(i) Menstrual bleeding.
(ii) A type of Manas Dosa.
(iii) Synonyms for minute dust particles.
(iv) Pollen grains of a Flower.
(v) Synonym of a plan named parpata.

Here, in present content it means menstrual bleeding (Bahira Puspa).

Second word "Nivritti" has many meanings such as: -

(i) Accomplishment, Fulfillment.
(ii) Completion, End.
(iii) Discontinuance of the influence of one rule over another.
(iv) Resulting.
(v) Ceasing, desisting, abstaining from
(vi) Inactivity.
(vii) Impropriety.

Thus, the term Rajanivritti means that particular stage of life when there is complete cessation of Artava Pravritti.

Climacteric: -

The climacterium is defined as that phase in the female ageing process making the transition from the reproductive to the nonproductive era. It may extend over a period of two decades usually beginning at about age of 40 years. (Webster's Dictionary – Cli-mac-ter-ic).

(i) A period or point in human life (as among women, the change of life, or Menopause.

In which some great change in the constitution, health, or fortune takes place, or is supposed to take place or to be especially likely to occur.
(ii) Any critical period or point.
It is your lot, as it was mine, to live during one of the grand climacterics of the world.

**Climacteric:** (Kli-mak ter-ik, kli'mak-te'rik) (Dorland’s Dictionary)

The syndrome of endocrine, somatic and psychic changes occurring at menopause: it may also accompany normal diminution of sexual activity in the male.

**Menopause** – The term 'Menopause' is made up of two words viz.

*Meno* and *pause*

The etymology of two words are as follows

- **Meno** - Month - Relation of menses
- **Pause** - Pausis - Stopping, Ceasation.

Thus, the menopause refers to final cessation of menstruation.

The Menopause is that time in a woman’s life when menstrual bleeding stops permanently. Actually the menopause is an episode in the climacteric. The climacteric represents that period in a woman’s life which is accompanied by a gradual decline in ovarian activity.

The definitions agreed to the first International congress on ‘Menopause’ are:

(a) The climacteric is that phase in the aging process of women that marks the transition from the reproductive stage of life to the non-reproductive stage.
(b) Menopause indicates the final menstrual period and occurs during the climacteric.
(c) The climacteric is sometimes, but not necessarily always, associated with symptomatology. When this occurs, it may be termed the 'climacteric syndrome'.

The climacteric and Menopause are physiological processes due to cessation of ovarian follicular function. These are peculiar to the human race, in lower animals ovulation and fertility continue into old age. Ten percent of men are also said to experience a climacteric, but at a rather later age than woman.

Thus, both the terms 'Rajanivritti' and 'Menopause' convey same meaning i.e. particular stage of life when there is complete cessation of Menstruation.

**Rajanivritti Kala :-**

> तद्वर्षाद द्वादशाहल्ल कालेवर्तमानसमस्यां पुनः।
> जरापक्षारिरार्णां याति पद्धाशतः क्षयमां।।
>
> (Su.Sa.3/9)

The period of the initiation of the first menses and its cessation are denoted by the term रजो दर्शाना and Rajanivritti in simple terms. In Brihatrayee and Laghutrayee also description regarding the same is available and there is no controversy regarding time of the first Artava darsana and Artavanivritti Kala. All the Acharyas have mentioned twelve years as the age of first Artavapravritti and Fifty years as the age of Artavanivritti.

Arundatta opines that the above mentioned ages are probable ages for Rajaprapravritti and Rajanivritti. There may be slight variation in individual cases, as Artavapravritti may come at eleven years and at the same time the age of Artavanivritti may be delayed. He further says that this age can be influenced by specific Ahara (dietetics) and Arogya (health)34.
The logic behind the age of Artavadarsana and nivritti – Artava is the byproduct of Rasadhatu and Rasadhatu’s functions are better in Taruna Avastha and decreases during the proudhavastha.

It has been further elaborated that just like in young or aged, plants flowers and fruits do not come up and fragrance is not explicit, similarly in male Sukra before 16 years and after 70 years of age and in females Raja (Menstrual Blood) and Stanya (Milk) before 12 years and after 50 years of age are not visible.

Menopause usually occurs between the ages of 45 to 55 years. Early or delayed menopause is considered when menopause happens before 35 years or after 55 years respectively. Early Menopause may be due to ovarian failure, oophorectomy and irradiation. Delayed menopause is usually due to some pelvic pathology.

**Causes of Rajanivritti (Nidana):**

The causes of Rajanivritti are not described, as such at one place in Ayurvedic classics, but the causes responsible for Rajapravritti may be taken as the causes of Rajanivritti.

The Svabhava or nature has been assumed as the main causative factor for Rajapravritti and for Rajanivritti also.

1. **Swabhava:** Charaka has quoted the theory of natural destruction perhaps from the Buddhism, according to which the body elements become disassociated with causative factors, however the disassociation is always there in the course of nature (Ca. Su. 16/27-28).

Thus, the phenomenon of ageing is natural in every individual, the same is true in relation to the reproductive life of a woman, in other words the
attained reproductive capability of a woman is bound to cease in the natural course of life, which is otherwise termed as Rajanivritti.

2. **Kala:-** The Kala is an important factor in the resultance of Jara. Acharya Caraka nicely explains that the same foetus after passing of sometime becomes Child, young and old (Ca.Sa.3/8)\(^{37}\). The Kala is a responsible factor for the Kshaya and Vriddhi Avastha. (Ca.Su.17/77)\(^{38}\).

Thus, it is clear that after a specific age, the process of ageing starts, which may be slow or fast depending upon the habits and other dietary factors of the individual.

3. **Environment:** Some of the favourable and unfavourable circumstances also plays an important role in Jara process. It is little for imagination that a woman living under unfavourable conditions is likely to develop ageing earlier and get Rajanivritti also earlier.

Acharya Caraka has considered some other factors along with the above factors, which are responsible for growth, these include Kala yoga (opportunity), svabhava Sansiddha (Favourable disposition of the nature), Ahara Sausthava (Excellence of properties of food) and Avighata (absence of inhibiting factors) (Ca. Sa. 6/12).\(^{39}\)

The factors like birth in a country where people are naturally strong, birth at a time when people naturally gain strength, favourable disposition of time, excellence of the quality of the Beeja (Sperms and Ovum) and Kshetra (Uterus) of the mother etc. are also considered as promotive of health (Ca.Sa. 6/13).\(^{40}\)

**Pathogenesis**(Samprapti):- Pathogenesis of Rajanivritti is not elaborately described in Ayurvedic texts. However, there are some points which require consideration in this regard. According to Acharya Susrta: -
Here, it has been clearly described i.e. the age of 50 years in Female body is a declining process due to Jara and thus resulting in the cessation of Artavapravritti and in other verse it has been mentioned that annarasa (Ahara Rasa) is responsible for the Rasadi Dhatu pusti by its prinanakarma. When the stage of Jara reaches, annarasa, is not so favourable, but Why? The answer as mentioned by Bhavamisra "Vardhakye Vardhate Vayu". Basically there is Vatavrdhii in Vrddhavastha and vatadosa by its ruksa, laghu guna act and it's opposite gunas the Snigdha and Guruguna of Rasadhatu are diminished. Rasadi dhatus ultimately the dravaguna of Dravadhatus decreases and Ghana dhatu (Guru) becomes laghu. Dravadhatu is responsible for Posana of every cells, but when the ruksa-laghu gunas of Vata increases, the qualities of drava decreases and it is unable to nourish the cells. Consequently the cells become sosita and go for senility and get the Rajanivritti.

Though Vata may be the chief responsible factors but all the three humours play active part in producing Rajanivritti as it has been clearly shown in the flow chart in next page-

**Samprapti Ghatakas:-**

- **Dosa-** Vata - Apana,Vyana.
  - Pitta - Pacaka.
  - Kapha - Kledaka.
- **Dusya-** Rasa -- Rakta -- mansa -- Meda -- Asthi -- Majja and Artava.
- **Agni -** Jatharagni Mandya.
  - Dhatweagni Visama.
Srotas - Mainly Artava Vaha and Rasavaha.
Srotodusti - Kriyahani Avastha (Less activities).
Udbhava Sthana – Rasa Raktavaha Srota.
Vyakta Sthana – Artavavaha Srota.

Physiological Process of Rajanivritti

1. Ahara
   - Ahara rasa
   - Production of Rasa dhatu and Posana Karma by Normal function
   - Prinan Karma of all Dhatus by proper channel
   - Cause of Jara Pakva
   - Vata Vriddhi (Laghu) with special Guna (Ruksa & Mandagni)

2. Visamata of dDhatavagni
   - Dhatuksaya
   - Particular Rasa Rakta Dhatu
   - Upadhatuksaya
   - Artava Sosa

3. Artavavaha Srotas
   - Produce RAJANIVRITTI
The consumption of Vata prakopaka ahara - vihara and the Vriddhavastha when Vata Vriddhi is evident, it can lead to dhatukshya starting from Rasa, Rakta and then others, this will in response lead to upadhatu nirmana alpata. i.e. artava will be produced in less quantity than the normal which can further vitiated vatadosa. When, the rakta approaching garbhasaya in the form of artava is less, then it will produce the sosa avastha, the stage resembling to the ischaemic condition of the artavavaha srotas and this leads gradually to Rajanivritti.

At the same time mithya ahara and vihar can directly lead to akalaja Rajanivritti.

**Endocrinology of Climacteric:**

Few years prior to menopause there is a marked reduction in the number of primordial follicles in the ovaries although there is yet normal production of oestrodiol, paradoxically the FSH level begins to rise. This increase in FSH may be due to increased pituitary sensitivity to Gn Rh during the period. The follicles gradually become depleted and the remaining becoming resistant to FSH. The combined effects result in low production of oestrodial with increased production of gonadotrophins specially FSH.

At menopause → no more follicles are available for sterodogenesis → Oestradial production at its lowest → no Endometrial growth → Absence of Menstruation.

In the post menopausal period oestrogens are produced through peripheral conversion of androstenedione and testosterone mainly from the adrenals and partly from the ovarian stroma.

The oestrogens are mainly oestrone. Gradually both sources fail to supply the precursor of Oestrogens and about 5 to 10 years after menopause, there is a sharp fall in oestrogen and trophic hormones. The woman is said to be a state of true menopause.
Before the menopause, the principal source of Oestradiol is direct secretion by the dominant follicle or the corpus luteum. After the menopause the production of androgens (androstenedioner and testosterone) by Ovarian stroma and the adrenal cortex becomes important, as this androgen serves as the precursor for oestrogen synthesis in fatty tissue.

**Dosavastha during Rajanivritti** :-

The predominance of Vata in old age is universally stated in all the classical texts. Caraka has coined the 'Vata Dhatu Prayah' meaning the possibility of predominant unvitiated Vatika qualities in the old age. It may also be considered that the Senscenace mechanism possibly has tendency towards the qualities of Vata Dosa. Further, Susruta stress upon this point is very clear 'Bhuyisatam Vardhate Vayuh' i.e. a surplus increase in the Vata occurs during this state. A closer perusal of these statements impart us that the predominance in Vata during old age does not seen to be merely a secondary effect. The initial increase of Vata does occur as 'periodical clock' during the life cycle. The virtue of its qualities apta initiate the mechanism of aging. The progression of aging with Dhatuksaya again add to the increase in the Vatadosa.

A considerable decrease in Kapha is evident in old age as we go through the feature of Rajanivritti (due to senility). The texts have included depletion of Dhatu, loss of virility and Bala as the important feature of old age. As these functions are dependent of Prakrita Kapha, the decrease in the same can very well be inferred. The involvement of Pitta is more a subject of debate. The frequency of such feature differ from person to person. Agnimandya is again an important sign of Vardhakya but it would be fallacious to outright assume pittaksaya in such conditions.
Following features are applicable in Rajanivritti according to dosas:

<table>
<thead>
<tr>
<th>Vata Pradhan Laksana</th>
<th>Pitta Pradhan Laksana</th>
<th>Kapha Pradhan Laksana</th>
<th>Manasika Laksana</th>
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<td>6. Hastapada Supti</td>
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**Dhatu Avastha during Rajonivritti:**

The major events of aging seem to act the level of different dhatus. However, the classical texts do not specify and particular Dhatu as taking leading role of the Rajanivritti pathology.

Gradual decline in the dhatu is uniformly noted by ancient Acaryas. Acarya Susrta opines that the period of old age is marked with day by day decrease of dhatu (Su.Su.35/35). Charak also considered 'Bhrasyamana dhatu guna' i.e. successive breakdown in the qualities of dhatu (Ca. Vi. 8/122). Thus, it is clear from the Caraka’s view that both qualitative and quantitative decrease in dhatu occur during old age. The same notion is also shared by Vagbhatta by stating ‘Kriyamana dhatu guna’ (As.Sa.8/28) Bhela Samhita throws further light in this regard. In Vriddhavastha the capacity for Viveka i.e. description of assimilated nutrients into Dhatu becomes hampered due to pariksaya (of dhatu).
Therefore, the replenishment of dhatu is also reduced as a result of already existing vitiation. Moreover it can further be assumed by the word ‘Viveko no yatha purvam viveçayate’ that improper metabolites might also result out of this. This definitely increase the accumulation of unwanted waste materials which cannot be flushed out of the body. Production of the respective dhatu with low quality is again another possibility out of such paripaka. By stating such an important factor Bhela has apparently referred the incapacitation of Dhatvagni. Obviously enough, Charaka has considered gradual decline in the qualities of Dhatu as a sign of Senscence (Ca.Vi.8/122).

The classical texts have not detailed the role of individual dhatu in the pathophysiology of Jara. Probably, the nature of vitiation being not similarly distributed and vary among the aged population. But lesser or more, the Ksaya of all the dhatus bound to occur as Bhela Samhita coins the term ‘Sarva dhatu pariksayate’ meaning the depletion of all dhatu results during Jara.

The whole marks of Rajanivritti such as Hrdpida, Hrta Spandanadhikya, Srama, Glani, Sabda asahisnuta, Tvak parusya, Ruksata, specifically refers towards Rasaksyaya and Rakta Ksaya. The frequent health problems of Rajanivritti as noted Sandhi Vedana, Katisula as Vataroga and Timira the depletion of Mansa and Majja dhatu.

The progressive atrophy of genital organs occur in Rajanivritti suggests specifically mansadhatuksaya. ‘Rajaksaya’ which is usually noted by classical texts during age of 50 years due to Jara. The terms like Rajanasa and Nivritti denotes the total cessation of Rajapravritti specifically refers towards Dhaturupa Rajaksaya Laksana.

Lastly another reference noted by Vagbhatta as one of the sign of Jara is Slathsara. (As.Sa. 8/28). Sara indicates rather exists by birth, the prevalence of Vata Prakopa Laksana and Vatavyadhi in Rajanivritti are indisputable. Equally, qualitative degredation of Dhatu guna, accumulation

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of waste products (Mala) due to improper metabolism and synthesis (Jatharagni and Dhatvagni) are evident during this stage.

**Physiological changes in Climacteric or Menopause and Post Menopausal age: -**

**Genital: -**

Progressive atrophy of genital organs occur with more and more deposition of Fibrous in them.

**Ovary: -** Ovaries shrink in size become wrinkled and white. They go small (5 gm each), fibrotic with furrowed surface. Primordial follicles get exhausted although in some ovaries a few follicles may persist for 5 years after menopause. Ovarian Vessels become sclerosed cortical stromal hyperplasia is a frequent finding due to high level L.H. is in women aged 40 to 60 years. Ovarian stroma becomes a source of small amount of androgens.

**Fallopian tubes: -** Fallopian tubes shrink with diminished motility.

**Uterus: -** The uterus becomes smaller and ratio between the body and the Cervix reverts to 1:2 Ratio. Endometrium becomes thin and senile. In some women endometrial hyperplasia may occur after menopause as a result of constant oestrogen stimulation, Cervix atrophies and flushes with the vaginal vault. Cervical secretion becomes Scanty, thick and later disappears.

**Vagina: -** The vagina becomes narrower, due to gradual loss of elasticity. The vaginal epithelium becomes thin. There is no glycogen. Doderlein’s bacillus is absent. The vaginal pH becomes alkaline.

**Vulva: -** The vulva shows features of Atrophy. The labia becomes flatter and the pubic hair becomes Scantier.
Bladder and urethra undergo similar changes to those of the Vagina. The epithelium becomes thin and is more prone to changes and infection. There may be bladder irritability and stress incontinence.

**Secondary Sex Characteristics:**

Breast show gradual atrophy of the glandular tissue resulting in flabbyness. These become pendulous due to deposition of Fat. Pubic and auxiliary hair becomes sparse.

**Physical:** Body weight decrease after 65 years. There is decrease in cell mass of organs. Skin wrinkles, becomes less elastic, with hair appearing on face, subcutaneous fat deposition occurs on the hip and thighs. Height diminishes postmenopausally after 65 years Kyphosis may develop due to spinal osteoporosis.

**Metabolic:** Osteoporosis occurs as a result of oestrogen deprivation and catabolic effect of cortisol, there is some consideration that premenopausal oestrogen deficiency by surgical removal of both ovaries can lead to high serum lipids and higher incidence of atherosclerosis and coronary heart disease. Hyperlipidamia occurs around and following menopause oestrogen therapy after the age of 40 in 'high risk' cases definitely increase the chance of thrombosis.

**Digestive:** hypochlorhydria develops; motor activity of entire alimentary tract diminishes resulting in dyspepsia and constipation in post menopausal woman.

**Psycho sexual:** Emotional upsets are common at menopause. A fundamental reason for emotional upset is that the menopause represents the end of the reproductive era and this means something to all women. Even those who have as many children as they want. It inevitably means more to the barren and unmarried women who has previously lived in hope. Married women are sometimes worried by the
idea that the menopause means the end of sexual desire and physical love. Sex life only weanes gradually as part of the aging process in both partners.

**Endocrinal:** - There is gonadal failure at menopause. Plasma oestrodial level falls. Oestrone remains normal Ovarian stroma however produces andostenedione post menopausaly adrenal cortex becomes the source of Oestrone derived from androstenedione. Moreover, there is extraglandular conversion of androstenedione to Oestrone in Fatty tissue in adiposity and Muscle and in liver disease after menopause. Ostrone becomes the predominating oestrogen after Menopause. Progesterone secretion ceases from the ovary due to failure of ovulation.

**Clinical features of Menopause and Climacteric:** -

The following signs and symptoms appear gradually in a normal woman in the climacteric period and thereafter.

1. **General Sign:** - Increase in Wt., deposition of fat on the hip, buttocks and around breast.

2. **Genital Sign:** - Vulva – Progressive atrophy with scanty hair with narrowing of the vaginal introitus.

**Vagina:** - This becomes narrow with tenting of vaginal vault, thinning of mucous membrane and loss of rugae.

**Cervix:** - Portion vaginalis atrophies and get flushed with vaginal vault.

**Uterus:** - Body is felt small and hard.

**Symptoms:** -

Menopausal syndrome refers to a group of symptoms that are experienced by some women during climacteric. These appear as follows:-
A. Menstrual Symptoms: -

(i) Progressive scanty menstrual loss followed by cessation of menses.
(ii) Menses at prolonged intervals finally ceasing.
(iii) Sudden cessation of menses.
- Prior to menopause menstrual cycle become anovulatory.
- Any excessive menstrual loss or irregular haemorrhage is not menopausal as is commonly believed, but is due to some pelvic pathology.

B. Vasomotor symptoms: -

'Hot flushes' (feeling of warmth) are characteristic of menopausal syndrome. It is probably related to a low level of oestrogen rather than pulsatile release of LHRH and rise in endorphin (opioid peptides) from hypothalamus. The endorphin has thermoregulatory activity.

'Hot flushes' due to Peripheral Vasodilatation. The patient experiences on the face and neck spreading profuse perspiration and frequently with palpitation. Hot flushes and night sweats are thermoregulatory disturbances which are characteristic of menopause. Night Sweats are the night time manifestation of hot flushes experienced during the working and walking hours.

C. Emotional and Psychological Symptoms: -

This is manifested by irritability, depression, fatigue, headache and Sleep disturbance. There may be sensation of 'pins & needles' prick in the palm and sole, disturbed sleep can be due to flushes and night sweats.
D. Genital and Sexual Symptoms: -

Libido is not usually materially reduced, but as the years gone, atrophy and dryness of the vagina can cause dyspareunia.

E. Musculoskeletal Symptoms: -

These appear as backache, pain in joints due to laxity of ligaments and muscles.

F. Digestive Symptoms: -

These appear as dyspepsia, flatulence and constipation.

TYPE: -

(1) Kalaja Rajanivritti (Prakrita Rajanivritti): -

Menopause usually occurs between the age of 45 to 55 years. It occurs at proper age and less intensity and may not be very troublesome.

(2) Akalaja Rajanivritti (Aprakrita Rajanivritti): -

(Premature & delayed Menopause)

Menopause before age of 35 years and after 55 years may be termed as akalaja, which means that it occurs before the prescribed age due to not taking the proper care of personal hygiene and not getting done Sodhana at proper time. This menopause is of greater importance in treatment.

It is rare for the menopause to occur before the age of 40 years, and the diagnosis of early menopause should never be made until all other causes for amenorrhoea have been excluded. Nor should any symptoms ever be ascribed to the menopause unless they are accompanied by amenorrhea. When menopause does occur unusually early, there is often a history of a similar occurrence amongst other members of the family.
Regular menstruation up to the age of 52 years is not uncommon and is of little significance.

Beyond that age, it should be regarded as unusual although not necessarily pathological, but if it continues beyond 55 years there is a clear indication for further investigation. The causes or associations of a delayed menopause are:

(a) Constitutional (a familiar or racial tendency)
(b) Uterine fibroids
(c) Diabetes mellitus and
(d) An oestrogenic tumour of the Ovary. The last causes irregular rather than cyclical bleeding.

Menopause also occurs due to surgical and radiation causes in certain women, which needs detailed history and identification.

**Prognosis (Sadhyasadhyata):**

The Kalaja Rajanivritti is Yapya i.e. by the treatment with Rasayana can be maintained. The Aprakṛta or Akalaja Rajanivritti should be treated according to the dosa and the accompanied disease.

**Line of Treatment:**

Rasayana Therapy is the principal line of treatment. Rasayana is defined as 'Yat Jara Vyadhi nasanam' i.e. which eradicates the diseases and senility is called as Rasayana.

As mentioned earlier Rajanivritti is svabhabika prakriya (natural process). Caraka considered it as 'Swabhabiko Nisa Pratikriya' i.e. by nature they are incurable or having no treatment. Cakrapani while commenting on this verse mentions that the word 'Nisa Pratikriya' means ordinary treatment and measures have no effect on ageing but Rasayana is the treatment of choice in Jara and Rajanivritti resulting due to Jara as it has been mentioned earlier. In this way the Rajanivritti can be treated by the Rasayana drugs.
Rajanivritti is Yapya in nature and Yapya is partial amenability of disease to treatment. Rather a person lives with the disorder without cure but without disturbed by the disease.

This means to say, a timely senescence can be maintained with measures by dietics and Rasayana, so that ill effect will not be there.

**MODERN TREATMENT:**

In modern medical science "no cure", Hence there are directed toward hormonal imbalance and their supplementation, there are short and long term aims in managing patients with problems related to menopause.

**General measures:** - Majority can be treated by assurance advise her to take care of health by physical exercise and rest and also having improved by nonfattening diet and regular evacuation of bowel, sedative and tranquilizer.

**Short term hormone replacement therapy:**

Routes of administration: - Exogenous oestrogens can be prescribed orally or parenterally currently available parenteral methods of delivery include transdermal patches, vaginal creams or pessaries and subcutaneous implantation.

In case of postmenopausal or hysterectomised women, ethinyl oestrodiol 0.01, 0.05 mg. is given orally at bed time for 20 days in a month for 4 to 6 months. Lowest dosage 0.01 mg. is started and then gradually raised to 0.05 mg. when necessary for symptom control, progestogen 10 mg. is currently added to oestrogen therapy for last 7 to 10 days reduce the risk of endometrial hyperplasia and perhaps endometrial carcinoma, withdrawal bleeding is possible on this therapy during the abstinence and period. In case of small bleeding careful follow up is continued. In case
there is any departure from small bleeding, therapy is discontinued and endometrial curettage is done for histopathological study.

On stoppage of oestrogen therapy if symptoms recur, oestrogen and progestogen therapy can be continued for maximum 3 ½ years (Hulka 1980). In case of prolonged treatment endometrium is curetted every year, B.P. is checked and triglycerides are estimated repeatedly to screen cases for cardiovascular complications. In case of adenomatous hyperplasia, Oestrogen is stopped, medroxyprogesterone 10 mg. is given for 10 days in a month for 3 months and endometrium is rechecked by biopsy. In case of persisting adenomatous hyperplasia, hysterectomy is performed.

Other oestrogen preparations as oestrone sulphate (premarin) 0.625 to 1.25 mg. can be given orally at bed time. Currently oestrone sulphate linking of endometrial carcinoma is disproved.

Combined ethinyl oestradiol methyl testosterone (Mixogen, organon) one-two tablet daily for 20 days in a month can be used for women with loss of libido. Inj. Mixogen (organon) can be given every 4 weeks.

In case of premenopausal menstruating women, with hot flush, sleep disturbance, oral contraceptive oestrogen – progestogen contraceptive pills can be given daily for 3 weeks starting from 5th day of menstruation. The therapy is continued for desired period under medical supervision. However women above the age of 40 years with risk factors of coronary thrombosis, smoking excessively & endometrial carcinoma are excluded to HRT.

Long term Hormone replacement therapy:-

By sequential oestrogen-progestogen therapy as above is indicated in postmenopausal women with intact uterus for prevention of osteoporosis. The physician has to balance the benefits and risk of prolonged oestrogen progestogen replacement therapy in post menopausal women as follows.

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## Benefits and Risk of HRT

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
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</table>
| - Therapeutic  
  - Relieve vasomotor symptoms, sleep disturbance, genital and urethral atrophy.  
  - Osteoporosis is prevented or reversed provided oestrogen is started before Osteoporosis starts and therapy is prolonged.  
  - Uncertain effect  
  - Cardiovascular: Coronary arterial disease or cerebro vascular accidents are not found certainly.  
  - Correlated with oestrogen therapy may offer protection to coronary disease in surgical menopause. | Endometrial carcinoma, menopausal endogenous Oestrone with aging and obesity can cause adenomatous hyperplasia and endometrial carcinoma.  
In post menopausal woman, use of exogenous oestrogen for high dose and prolonged period over 3 ½ years cause endometrial neoplasia. |

### Relative Contraindications of Oestrogen Therapy:

- Previous endometrial hyperplasia.
- Previous myocardial infarction or Stroke.
- Previous venous thromboembolic disease.
- Hypertension.
- Active liver disease.
- Gall stones.
- Endometriosis and Fibroids.
Therefore hormone therapy should not be denied to a premenopausal and postmenopausal women if she gets benefits out of it provided, she continues the therapy under medical supervision and she is screened for high risk factors as myocardial infarction, endometrial carcinoma. Fortunately lesser number of menopausal Indian women report to the doctor for amelioration of menopausal syndrome.
DRUG REVIEW
AMLAKI (Emblica officinalis)

HARITAKI (Terminalia chebula)

SATAVARI (Asparagus racemosus)
DRUG REVIEW

To prepare and dispense a medicine are necessity of the ingredients is always important. It is admitted by all the scholars of ancient as well as modern era that the knowledge of drugs is the key of success in the field of practice.

Description of individual drugs: -

1. Haritaki

   Latin Name – Terminalia chebula Retz.
   Family – Combretaceae.
   Part used – Fruit
   Gana –
   Su. –Triphala, Vacadi, Mustadi, Amalakyadi.
   Ca. –Prajasthapana, Vayasthapana, Jwarahara,
   Arsoghana, Kustaghana, Kasahara,
   Virecanopaga, Hikanigrahana.
   Rasa: - Five rasa (except the lavana rasa, dominated by Kasayarasa).
   Guna: - Laghu, Ruksa.
   Veerya: - Usna.
   Vipaka: - Madhura.
   Dosakarma: - Tridosahara.

   Action: - Vayasthapana, Rasayana, Medhya, Deepana, Pacana,
   Pittasaraka, Anulomana, Krmighna, Hrdaya, Sonitasthapana,
   Sothahara, Vedanasthapana, Vrana Sodhana, Ropana,
   Swasa-Kasahara, Mutrala, Kustaghna, Jvaraghna, Vrsya,
   Prajasthapana.

   Chemical Composition: - The Haritaki fruits contain some astringent constituents like Tanic acid (24.6, 32.5%), Chebulic acid,
chebulinic acid, corilagin, Garlic Acid, Apart from these the fruits contains sugar, 18 amino acid and in small quantities phosphoric acid; succenic acid and schemic acid. A brown yellow pigment is also present in this. The chebulinic acid splits into Tannic acid and Gallic acid on boiling.

2. Amalaki

Latin Name : Emblica officinalis Gaerth.
Family : Euphorbiaceae.
Part used : Fruit.

Gana: -
Su – Amlakyadi, Triphala, Parusakadi, Mustadi.
Ca- Vayasthapana, Prajasthapana, Hrdya, Jvarhara, Kasahara, Kustaghna, Virecanopaga.

Rasa: - Five Rasa (Except the katu rasa dominated by Amla rasa)
Guna: - Guru, Ruksa.
Veerya: - Sita.
Vipaka: - Madhura.
Dosakarma – Tridosahara.

Action: - Vayasthapana, Rasayana, Vrsya, Garbhasthapana, Dahaprasamana, Jvaraghna, Pramehaghna, Kustaghana, Hrdya, Sonitasthapana, Deepana, Rocana, Anulomaka, Caksusya, Kesya, Medhya, Balya.

Chemical Composition: - The fruits contain Galic Acid, Tannic Acid, Sugar, albumin, cellulose, Minerals and especially calcium. It contains Vitamin ‘C’ in abundant quantity. Amalaki juice contains 20 times more vitamin ‘C’ than orange Juice. In pulp 720 mg/ 100 gm. And juice 910 mg / 100 gm. Other contents are as: -
Humidity 81.2, Protein 0.5, Fat 0.1, Minerals 0.7, Carbohydrate 14.1, Calcium 0.05, phosphorus 0.02, Iron 1.2 mg., Nicotinic acid 0.02 mg/ 100gm, Fruits contains 28% tannin.

3. Guduci

Latin Name: - Tinospora Cordifolia (Willd)
Family: - Manispermaceae.
Part used: - Stem.
Gana: -
Su. – Guducyadi, Patoladi, Aragvadhadi, Kakolyadi, Syamadi, Vallipancamula.
Ca. – Vayasthapana, Dahaprasamana, Truptighna, Sandhaniya, Trisnanigrahana, Stnya Sodhana, Snehopaga, Hikkanigrahana.
Rasa – Tikta, Katu, Kasaya.
Guna – Guru, Snigdha.
Veerya – Usna
Vipaka – Madhura.
Dosakarma – Tridosasamaka.


Chemical Composition: - Three crystalline substance giloin a Glucocide \( C_{23}H_{32}O_{10} \), 5H\(_2\)O, Giloninina non glucocidite bitter principle, \( C_{17}H_{9}O_{5} \) and gilosterol \( C_{28}H_{48}O \) have been isolated from fresh stem bark Barberine and a waxy substance are also present.
4. Satavari

Latin Name: Asparagus racemosus
Family: Liliaceae
Part used: Root.

Guna:
Su.: Vidarigandhudi, Kantak panchamula, Pittaprasaman.
Ca.: Balya, Vayasthapana, Madhura Skandha, Prajasthapana, Sukrajanana, Stanya janana.

Rasa: Madhur, Tikta.
Guna: Guru, Singha.
Veerya: Sita.
Vipaka: Madhura.
Dosakarma: Vatapitta samaka.

Action: Medhya, Vedana Sthapana, Sula hara, grahi, Sukral, Stanya janana, Murla, Balya, Hrdya, Deepana, Netrya.

Chemical Composition: Large amount of Saccharine matter and mucilage. Glycyrrhizic acid, Glycyrrhetinic acid.

5. Prawal Pisti

Latin name: Corallium rubrum.
English name: Calcium Carbonate
Part used: Praval mool, Sakha

Rasa: Kasariya or Nirasa.
Guna: Laghu.
Veerya: Sita.
Vipaka: Madhura.
Dosakarma: Tridosaghna.

Action: Deepana, Pacana, Netrya, Balya, Vrishya, Visaghna, Bhutaghna, Sukrala, Varnya.
Probable mode of Action of therapy: -

It is known that every single herb mentioned in the texts has multiple actions. To view their activity under goal oriented research model is a difficult task. Therefore it was thought wise to club few herbs having similar actions, so that the particular activity under test becomes potentiated, with such an intension five drugs are collectively used under vaya sthapan and Balya Rasayan. While selecting the drugs the availability and noncontroversial nature was kept in mind.

The stage of Rajanivritti is due to Jarapakka avastha of a body. It is clear from the foresaid samprapti that it is a vatapradhan avastha involving both the Dosa permutations being vatapitta and vata kapha. The Agnimandhya and diminished the Dhatu Sara is the main underlying factor in the evolution of Jara and is directly related to Rajanivritti vikara (Menopausal Syndrome).

1. Effect on Reproductive System: -

<table>
<thead>
<tr>
<th>Herb</th>
<th>Action</th>
</tr>
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<tbody>
<tr>
<td>Haritaki</td>
<td>Vrishya, Praja Sthapana</td>
</tr>
<tr>
<td>Amlaki</td>
<td>Vrishya, Garbhasthapana.</td>
</tr>
<tr>
<td>Guduchi</td>
<td>Vrishya, Vayaasthapana, Stanya sodhana.</td>
</tr>
<tr>
<td>Satawari</td>
<td>Prajasthapana, Stanyajanan.</td>
</tr>
<tr>
<td>Praval Pisti</td>
<td>Vrishya, Pranja Sthapana</td>
</tr>
</tbody>
</table>

By virtue of the properties of the ingredients it also acts favorably on the reproductive system. All the drugs have best Rasayana properties.
2. Effect on vasomotor symptoms: -
(Hot flushes, Excessive sweating, (Jwara means santapa – Hot flushes))

Haritaki - Jwaraghna
Amlaki - Dahaprasamana, Jwaraghna.
Guduchi - Dahaprasamana, Jwaraghna.
Satabari - Pittaprasamana, Jwaraghna.
Praval Pisti - Jwaraghna, Anti perspiration.

Widely used in excessive perspiration especially nocturnal perspiration.

3. Effect on Digestive System: -
(Constipation, Flatulance)

Haritaki - Dipana, Pacana, Carminative, Anulomana, Mild laxative.
Amlaki - Rocaka, dipana, Anulomuka, Antacid & carminative
Guduchi - Dipana, pavana, Anulomuka, Antacid, Pittaprasamana
Satabari - Dipana, Pittaprasamana.
Praval Pisti - Dipana, pacana.

It may be conclude that this drugs combination possess significant Dipana, Pacana, Anulomok and Agnivardhaka properties.

4. Effect on Psychological symptoms: -
(Fatigue, Depression, palpitation, irritability, Sleep, disturbance.)

Haritaki - Balya, Medhya, Hridya, Sonita sthapana, rasayana property.
Amlaki - Balya, Medhya, Hridya, Sonita sthapana best rasayana property.

Guduchi - Medhya, Hridya, Raktavardhak, Rakta sodhak & best rasayana property.

Satavari - Medhya, Vedana sthapana, sulahara, Balya, Hridya, Netra.

Praval Pisti - Balya.

5. Effect on Musculo skeletal System: -
(Backache, Joint pain)

Haritaki - Vedana Sthapana, Sothahara.
Amlaki - Vrishya.
Guduchi - Vedana sthapana.
Satavari - Vedana sthapana.
Praval Pisti - Good source for Calcium.

From the above maintained pharmacodynamic properties of the drugs probable mode of action can be narrated us follows: -

In the vriddhavastha, there is dominance of vatadosa. All the ingredient of drugs used in the present study are having vatasamak properties. Thus, the trial drug can effectively pacify the vatavriddhi. As maximum symptoms in Rajonivritti avastha are due to vitiated Vata, drugs also pacifies that.

Agnimandya being the common manifestation in the Rajanivritti, which needs to be corrected. All the ingredient of drugs are having the property of deepan, Pasana. Thus the trial drug due to its properties acts, effectively on Jatharagnis and relived symptoms like constipation, flatulence etc.

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The Dhatukshaya is the ultimate result of Jarapakvavastha, particularly the Dravadhatukshaya is very much noticed in this stage of life, because of Rasa, Rakta, drava dhatukshaya. Artava Sosa also results, because Artava is the upadhatu of Rasadhatu. As the ingredients of trial drug is specifically designed for Rasayana action. So, without much description, it can be said that the trial drug can be effectively check the Dhatukshaya by their Rasayana Action.