

## **HORMONAL CORRELATES OF MENOPAUSAL TRANSITION: THE TRIDOSHA-VAYA RELATIONSHIP OF AYURVEDA**

**Dr.SHRIDEVI T N<sup>1</sup>, Dr.SHREEVATHSA<sup>2</sup>**

<sup>1</sup>Final year PG scholar, <sup>2</sup>Professor & HOD, Department of Ayurveda Samhitha and Siddhanta, Government Ayurveda Medical College, Mysore

### **Abstract**

Menopause, though not a pause but an end, is a vital physiological transition in the reproductive life of a woman. Menopause occurs at median age of 46.2 years in Indian woman.<sup>1</sup> The menopausal transition brings out symptoms such as vasomotor symptoms, vaginal dryness, fatigue, insomnia, depressive symptoms, decreased libido, joint pain & cognitive disturbances, of which predominantly the vasomotor symptoms lasts for about four years in most woman approaching menopause.

The normal female reproductive hormonal levels fall in the middle age. The hormone changes associated with the menopausal transition (MT) are studied in the contemporary science widely; this covers the study of variation in the level of a variety of female reproductive hormones such as FSH, AMH, Inhibin and Estradiol (E2).<sup>2</sup>In 2001, the Stages of Reproductive Aging Workshop (STRAW) classified female reproductive life into 7 stages using bleeding and hormonal criteria, specifically FSH (2). Creating a staging system for reproductive aging helped to standardize definitions for research. The menopause is called as artava kshaya in Ayurveda that occurs around the age of fifty years as per Ayurveda. The sharira and tridosha have the influence of vaya (age) on them. There will be effect of vaya on sharira avastha and atrava pravritti in woman. The present article emphasizes the study of clinical consequences of menopausal transition with correlation of hormonal levels during menopause as per Ayurveda through the study of tridosha (three bio-humors) & vaya (age) relationship.

### **Key words**

MT (menopausal transition), artava kshaya, menopausal hormones, tridosha, vaya

## **Introduction**

Menopause is not an illness, but a physiological event experienced by woman when she approaches the end of her reproductive age. Menopausal transition (MT) indicates ovarian ageing in woman. The Menopausal Transition (MT) is the time in each woman's reproductive life that proceeds the final menstrual period (FMP).<sup>2</sup> Average age of menopause of an Indian woman is 46.2 years.<sup>3</sup> Most of the woman experiences troublesome symptoms during menopause such as vasomotor symptoms, vaginal dryness, decreased libido, insomnia, fatigue, joint pain, depressive symptoms & cognitive disturbances.

The hormonal events in the early & late menopause have been studied in the contemporary science. The hormones that are observed for change during menopause are the FSH (Follicle Stimulating Hormone), AMH (Anti Mullerian Hormone), Inhibin B and Estradiol (E<sub>2</sub>) studied through STRAW criteria of reproductive ageing of woman.

In Ayurveda, there is a need to understand & interpret these endocrine findings (hormonal changes) during menopause. This is possible when the findings of those studies related to hormonal changes that occur in menopause are interpreted utilising the basic principles of tridosha and vaya of Ayurveda.

The present paper attempts to analyse the hormonal changes in menopausal woman with the help of effect of vaya (age) on tridoshas (three bio-humors) i.e. the physical, physiological & psychological changes that occur in the woman body, the hormonal levels that vary in menopausal women as a result of her advancing age through tridosha & vaya relationship.

## **Materials & Methods**

The journals of contemporary science like NCBI etc. The Charaka Samhitha, Sushruta Samhitha & Asthanga Hridaya with the respective commentaries wherever necessary.

The journals mentioned above are searched using the keywords menopause, menopausal hormones,

menopausal transition, clinical consequences of menopause etc.

About three to four articles were selected for reference. The articles with repetitive content or findings were not considered. The articles were selected based on relevance, suitable content, which are more recent studies & read. The studies with the findings of hormones changes in menopause with the relevant points of consideration are noted down for further analysis.

### **Review of Literature**

The menopausal transition indicates the phenomenon of ovarian ageing. This ovarian ageing is a process that every woman has to undergo naturally. The female body as the age advances undergoes changes in the hormonal pattern.

The changes in hormonal pattern (Depicted in Table No 1) lead to,

**1. Changes in Menstrual cycle** – The periods tend to be irregular, more in duration of bleeding in perimenopause, later tend to cease presenting with amenorrhoea. The cycles transit from ovulatory to an-ovulatory at the end of menopause.

**2. Appearance of menopausal symptoms** – Of which hot flashes are experienced by 80% of woman in perimenopause and some other symptoms which vary greatly among women.

The diagnosis of menopause is based on irregular menstruation and somatic, psychological symptoms. The rule of thumb for the diagnosis of menopause is 'no periods for in a row of twelve months'. The endocrine markers (hormones) of menopause are not reliable for its diagnosis as they do not reliably predict the length of menstrual period or final menstrual period.

There are a number of symptoms noticed just before, during and after the menopause along with irregular menstrual periods or amenorrhoea. Women's experiences of menopause vary greatly, and only a few have severe symptoms that last a long time.

The start of menopause has subtle symptoms that some women do not observe whereas some women have symptoms troubling her day to day activities. On an average 85% of woman experience the hot flashes for about 5.2 years.



The balance of hormones in a woman's body changes during menopause. Many processes in the body are regulated by hormones, and it can take some time to adapt to the changes. The MT involves the changes in central neuroendocrine system as well as the changes in ovary which finally accounts to profound decline in the number of follicles in ovary. Hence, MT is associated with changes in bleeding pattern and hormone profiles. Throughout their reproductive years, women's ovaries produce the female sex hormones. These hormones tend to fall progressively just before few years starting to menopause. The STRAW (Stages of Reproductive Aging Workshop) criteria reviewed advances in understanding of the critical changes in hypothalamic-pituitary-ovarian function that occur before and after the final menstrual period. The following is the table showing summary of hormones of reproductive aging by STRAW criteria.

As a standardized staging system for reproductive aging, STRAW made a substantial contribution to women's health research by providing consistent

classification of menopausal status for studies of midlife women.

### **Seven Stages of STRAW**

STRAW divided the adult female life into 3 broad phases: reproductive, menopausal transition, and postmenopause. These 3 phases included a total of 7 stages centered around the final menstrual period (FMP, Stage 0). The reproductive phase was divided into Stage -5, -4 and -3 corresponding to early, peak and late, respectively. The menopausal transition phase consisted of Stage -2 (early) and Stage -1 (late), and the postmenopause phase contained Stage +1 (early) and +2 (late). Stage -3 was characterized by regular menstrual cycles and increasing levels of FSH. Stage -2 was characterized by variability in menstrual cycle length and increased levels of FSH. Stage -1 was characterized by onset of skipped cycles or amenorrhea of at least 60 days and continued elevation of FSH. The early menopause occurs at median age of 47 years and late menopause at median age of 49 years. The present paper puts light on only on the hormonal patterns of MT

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(menopausal transition) stage which is again of early and late MT and falls

under the stage -2 and stage -1 respectively.

Table No 1

Summary of hormones of reproductive aging by STRAW criteria<sup>2</sup>

Hormones	Peak Reproductive	Late Reproductive	Early MT	Late MT	<b>FMP</b>	Post Menopause
<b>FSH</b>	Normal	↑	↑	↑		↑
<b>AMH</b>	Normal/↓	↓	↓	Undetectable		Undetectable
<b>Inhibin B</b>	Normal	↓	↓	Undetectable		Undetectable
<b>Estradiol</b>	Normal	Normal	Normal	↓		↓

\*FMP= Final Menstrual Period

The data in the table show an increase in FSH and decreases in AMH, inhibin B and estradiol over menopausal transition.

**Early menopausal transition**

Early menopausal transition is marked by increased variability in menstrual cycle length, defined as a persistent difference of 7 days or more in the length of consecutive cycles. Cycles in the early menopausal transition are also characterized by elevated but variable early follicular phase FSH

levels and low AMH levels and AFC (Antral follicle Count).

**Late menopausal transition**

The late menopausal transition is marked by the occurrence of amenorrhea of 60 days or longer. Menstrual cycles in the late menopausal transition are characterized by increased variability in cycle length, extreme fluctuations in hormonal levels, and increased prevalence of anovulation. Based on studies of menstrual calendars and on

changes in FSH and estradiol, this stage is estimated to last, on average, 1 to 3 years. Symptoms, most notably vasomotor symptoms, are likely to occur during this stage.

In Ayurveda, menstrual bleeding is called artava. Artava is said to be the upadhatu of rasa dhatu by all authors. The menstruation (artava pravritti) begins at the age of twelve years and menopausal changes (artava kshaya) occur in woman around the age of fifty years.<sup>4</sup>

It is said that the kapha, pitta and vata doshas comparatively predominates over the other respectively as the age advances.<sup>5</sup> Ayurveda defines age as the state of the body corresponding with the length of time.<sup>6</sup>

The age is broadly divided into three atages as bala, madhya and jirna by Charaka. The kapha, pitta and vata doshas are relatively predominant in the bala, madhyama and jirna respectively.

## **DISCUSSION**

In the diagnosis of menopause 'age' is the key factor as menopause itself is defined keeping the age of woman. Menopause is the transition that

indicates the time factor (kala). Hence concept of vaya (age) comes to picture in artava kshaya.

Age specific changes in female reproductive hormones are understood using age specific (vaya) changes in tridosha. But here comes the question as to what changes in female body occur pertaining to her reproduction as a result of her advancing age. The answer is the change in the female reproductive hormonal pattern when she enters menopause which in turn produces the changes in ovary, there by menstrual cycles and appearance of physical, psychological symptoms. So, this means that the age has an impact on hormones.

The functions of these hormones are studied with the correlation of functions of tridoshas as it is said that the tridoshas have an influence of vaya on their function and age specific dosha predominance is seen.



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<b>Age</b>	<b>Sub- classification</b>	<b>State of dhatu</b>	<b>State of dosha</b>
Bala	Upto 16 years	Aparipakva	Predominance of kapha dhatu
	16 to 30 years	Vivardhamana dhatu guna	
Madhyama	30 to 60 years	Avishiryamana dhatu guna	Predominance of pitta dhatu
Jirna	60 to 10 years	Hiyamana dhatu guna Bhrushya mana dhatu	Predominance of vata dhatu

**Discussion on the age of menopausal transition**

There is no separate classification of age for woman mentioned by Brihatrayi. Artava kshaya occurs around the age of fifty years.

According to Charaka, the madhyama vaya (30 to 60yrs) has the avishiryamana dhatu guna (stable properties of dhatu) with predominance of pitta dosha.

According to Sushruta, the parihani stage of madhyama vaya is between 41 to 70 years where dhatus starts to degenerate (ishath parihani). Hence the age of commencement of menopausal transition (50 years) occurs in madhyama vaya by both authors (yaati panchashatah

kashayah). But when the current age of menopausal transition is considered (mean age = 46.2 years), the classification of age by Sushruta suits better. Dalhana also clarifies that the age at menopause can vary less or more than the 50 years.

The reasons for artava kshaya are,

- Influence of advancing age over the dhatus
- Influence of advancing age over the doshas
- Swabhava

**Discussion on variation in the hormonal levels during MT**

- ✓ At peak reproductive age, all the four hormones are normal with normal functions of menstruation.

- ✓ At late reproductive age, FSH starts to dominate which corresponds to vata dosha dominance in body.
- ✓ AMH & Inhibin starts to decrease which corresponds to decreased dominance of pitta and kapha dosha in body.
- ✓ AMH & Inhibin are undetectable at the late MT stage as well as post menopause. Hence they are correlated to kapha dosha.
- ✓ Estradiol however, starts to vary at late MT, that shows the gradual decline in the dominance of pitta as the age advances.

#### **Discussion on symptoms of MT**

The symptoms appear during late MT. The clinical consequences of MT can be broadly categorized into,

1. Physical – hot flashes, insomnia, fatigue, joint pain.
2. Psychological – diminished cognitive functions, depressive mood and
3. Sexual – vaginal dryness, decreased libido.

The above said symptoms are diagnostic of menopausal transition (MT) along with symptom of irregular periods or amenorrhoea.

These symptoms when analysed for doshik predominance represent the predominance of vata and pitta dosha as follows,

- Vata – diminished cognitive functions, depressive mood, joint pain, vaginal dryness, decreased libido
- Hot flashes by pitta
- Insomnia, fatigue by both vata and pitta

The menstrual cycles tend to be irregular, anovulatory and longer in duration is because of increased functions of vata dosha causing more drainage of artava from garbhashaya.

#### **Discussion on doshik predominance by effect of vaya**

Vata dominates at old age and pitta dominates over middle age. But it is important to consider the transition of doshik predominance from middle to old age. Pitta dosha gradually lowers in dominance and vata dominates gradually from middle to old age and at the extreme end of old age, vata is highly predominant.

The artava dhatu does dharana (sustenance of life) but not dhatvantara poshana (nourishment to other dhatus) which makes it to be



called as upadhatu (of rasa).<sup>7</sup> Rasa dhatu does very little nourishment (prinana) to the dhatus in the old age (old age)<sup>8</sup> since the dhatus are in kshiyamana avastha in old age. This proves the FSH hormonal pattern to be similar to vata dosha predominance that affects the artava (menstruation). Hence by this, it is observed that FSH is understood as vata dosha as it gradually takes over pitta.

AMH and inhibin declines fast before the onset of menopause which is similar to kapha dosha. Estradiol remains stable, begin to decrease later than other hormones in the late MT which shows the behaviour of pitta dosha.

### **CONCLUSION**

The doshas as well as dhatus in body invariably have the impact of time on them. The STRAW criteria of reproductive ageing of woman studied the hormonal patterns of MT which is considered for the age wise doshik dominance in Ayurveda.

The important hormones that are studied for their variation in menopausal transition shows the pattern of relationship of tridosha-

dhatu and vaya as per Ayurveda. Increasing levels of FSH and decreasing levels of AMH, Inhibin, estradiol corresponds to variation in the predominance of levels of vata (more predominant in old age), kapha (more predominant in young age) and pitta (more predominant in middle age). Many such research studies are in need to establish the link between dosha-dhatu and hormones in Ayurveda.

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**Corresponding author:**

**Dr.SHRIDEVI T N,**

Final year PG scholar,

Department of Ayurveda Samhitha and  
Siddhanta Government Ayurveda Medical  
College, Mysore

Email: [shreedevitn@gmail.com](mailto:shreedevitn@gmail.com)

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