



Review Article

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DHATUROOPI SHUKRA AND BEEJAROOPI SHUKRA: A CRITICAL REVIEW

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ABSTRACT

Shukra is studied in Ayurveda both as a dhatu and beeja. As a mammalian human body comprises both somatic and gonadal cells. Somatic cells help for growth and regeneration through mitosis. Meiotic cell division causes equal contribution for the inheritance from maternal and paternal sides. Beejartham (reproduction) is the supreme function attributed to Shukra. Reproduction refers to the formation of new cells for tissue growth, repair/replacement (sukshnavayavantaropatti), or the production of a new individual (shareerantaropatti). Regenerative capacity is distributed unequally among species, individuals, and tissues. The affliction of shukrastana by kusthadosh (skin disease) causes a failure in regeneration. The affliction of parents' shukra and artava (gametes) by kusthadosh (skin disease) inherits to the next generation. Vrushan (testis) and medru (penis) are the moola of the shukravahava srotus, which is meant to fertilise the ovum (beejarupishukra). Majja (bone marrow) and stana (breasts) are the moola of the shukravaha srotus of the one pervading the entire body (dhaturopishukra).

Keywords: Shukra, Dhatu, Beeja, Streeshukra

INTRODUCTION

Growth and reproduction are characteristics of cells, indeed of all living organisms. Jarayuja (viviparous), Andaja (oviparous), Swedaja (sweat born) and Audbhija (sprout born) are the four types of living things classified based on their origin. As quoted by Acharya Charaka, "the human body is made up of innumerable Paramanus (cells) which are subjected for the continuous process of Samyoga (fusion) and Viyoga (fission) with the influence of Vayu¹." Samyoga happens during Shareerambha Kala (generation/regeneration) and viyoga during vinashakala (degeneration)². Shareera and kaya are the synonyms of the body that indicate a continuous process of Kshati (degeneration) and Kshati poorana (repair/regeneration).

The ongoing processes of kshati and kshatipoorana will be balanced well when dosha (3 biological humours), dhatu (7 basic tissues) and malas (wastes) are in a state of equilibrium. Hence, these three are known as roots which keep the existing body stable³. Ayurveda explains sapta dhatu siddhanta (theory of seven basic tissue elements), nourishing and supporting the body by performing specific functions⁴. Among them, Shukra (reproductive tissue) is the 7th Dhatu. Shukra is studied as Dhatu (somatic component) and Beeja (male gamete). Most Ayurvedic scholars consider both as synonyms. But it is not so⁵. An effort is made to clear the controversies regarding this.

Shukrotpatti

Ayurveda explains two categories of dhatu poshanyayas (theory of nourishment of tissues), a) Kramanwita dhatu poshananyaya (sequential formation of dhatus) and b) Ek kala dhatu poshananyaya (simultaneous formation of tissues). Jatharagni converts food into sara (essence) and kittabhaga (waste)⁶ and

subjects same for the manifestation of respective attributes specific to mahabhutas in the ingredients of food⁷. The essence of food absorbed from kosta (G.I. Tract) is subjected to metabolic transformation by the action of dhatwagni (metabolic enzymes present in respective tissues). The resultant metamorphosis is categorised as prasada paka (transformation of nourishing material) and kittapaka (transformation of waste products)⁸. Prasad paka nourishes Rasa, Rakta, Mamsa, Meda like this up to Shukra dhatu obtaining nourishment from prasadamsha of majja dhatu (the preceding dhatu of shukra) by the action of Shukradhatwagni. Vayu and Akash mahabhutas produce porosity in asthes (bones) and shukra oozes like water from a new earthen pot⁹. Acharya Dalhana defines masthulunga (brain) as masthiskagata majja¹⁰.

Time required for conversion of ahara rasa into shukradhatu

According to Acharya Sushruta, ahara rasa, once formed, stays in each dhatu for a period of 3015 kalas (approximate about five days). Like this. It takes one entire month for ahara rasa to get converted into shukra dhatu in men and artava in women¹¹. Acharya Dalhana considers the word Artava as Shukra (streeshukra)¹². The duration of the conversion of ahara rasa into Shukra depends on the agni. If the agni is optimum, shukra may be formed within a day. It takes six days for the madhyamaagni (average digestive power), and in mandagni (poor digestive power) time required for conversion of ahara rasa to shukra may extend up to one month¹³.

Streeshukra

As per the above quotation, the word "Artava" denotes streeshukra, as commented by Acharya Dalhana. Artava (ovum and flowing constituent of ovum) is formed on the seventh day as

a upadhatu of Rasa dhatu (plasma)¹⁴. Acharya Sushruta has also mentioned when sexual (lesbianism) activities happen between two sexually excited women, the shukra secreted by one into others yoni (female genital tract) causes the formation of Garbha (conception), which is anasthi (devoid of hard bones). Suppose a ritu snata stree (woman during ovulation) dreams of having intercourse. In that case, the artava gets released in her with the influence of vata, mixes with her shukra secreted due to sexual excitation and forms Garbha, devoid of "Paitrukaguna" (Pitrujabhava/ Paternal inheritance)¹⁵. Keshha and loma (hairs), smashru (beard), nakha (nails), danta (teeth), sira (veins), snayu (ligaments/tendons), dhamani (arteries) and retas (shukra) are the pitruja bhavas¹⁶. Ashtanga samgrahakara explains, "streshukra gets secreted in the female genital tract during sexual intercourse, but it doesn't possess any role in the manifestation of Garbha"¹⁷.

Properties of shukra

Acharya Charaka explains shukra, which is bahala (dense), Madhura (having madhurasara), avisram (not having bad smell), guru (heavy), picchila (slimy), shuklam (white), bahu (secreted in abundant quantity)¹⁸, snigdha (oily) and avidahi (non-irritating to female genital tract after ejaculation) can fertilise an ovum without any doubt¹⁹. Acharya Sushruta adds drava (liquid), madhugandhi (smelling like honey) and tailakshaudranibham (appearing like an admixture of oil and honey) to the properties of shukra^{20,21}. Anutwa (atomicity) and pravana (moving from an area of higher concentration)²² are two essential properties of shukra.

Functions of Shukra

Dhairya (braveness), chyavana (sheegratwenavasamsram/ ejaculation of semen), preetim (sneham pramadasu love and affection towards female), dehabalam (dehabalam utsahopachayam/physical fitness as well as enthusiasm), harsham (utkantajananam pramadaswewa/ libido), beejartham (reproduction) are the functions of the shukra²³. Among them, beejartham is considered the supreme function of the shukra. Acharya Dalhana considers klaiba (impotent persons) as Adheera (non-confident)²⁴.

Shukra as beeja

Shukra (spermatozoa) and shonita (ovum) are known as beejas (Gametes)²⁵. Among them, shukra is known as pumbeeja (male gamete), and Artava is known as streebeeja (female gamete). Acharya Chakrapani defines beeja as "one giving rise to similar kind of progeny (beejamswasadrushamankuramkaroti)"²⁶. Human gametes are composed of genetic materials (beejabhaga/chromosome, beejahagavayava/genes), responsible for similar progeny genesis. The human body's tissues, organs, and parts in a fetus develop and grow as per the genetic code inherited through the beejbhagas/ bhagavayavas of the male and female gamete²⁷. Suppose the beeja bhaga/bhagavayav responsible for the genesis of a specific organ gets upatapta (mutated), then vikruti (morbidity) will be seen in that particular organ of foetus/human being as per the mutation affecting either of the genetic materials. If either of these genetic materials remain non-mutant, morbidity fails to inherit to the next generation even if the parents suffer from that morbidity²⁸.

Sex determination and Shukra

Sex determination in Ayurveda is explained as the predominance of shukra causing a male baby, the predominance of artava causes females. In contrast, an equal predominance of shukra and artava in resultant foetus causes a sterile²⁹. Predominance is considered

as a special potency by acharya Dalhana³⁰. Acharya chakrapani has mentioned it as beejajanakabeejabhaga in the context of Dwiretaska³¹ as well as "Shukraroopabeejajanakobhago beejabhaga (beejabhaga responsible for the genesis of shukraroopibeeja/Y chromosome) in the context of purush vyapadas³² and "beejasyachartavaroopasyajanako beejabhaga (beejabhaga responsible for the genesis of Artavaroopibeeja/X chromosome)" in the context of streevyapadas³³. Hence, the predominance of shukra is considered the predominance of shukrajanakabeejabhaga (Y chromosome) and artava as artavajanakabeejabhaga (X chromosome). Thus, beejaroopishukra determines the sex of the foetus.

Shukravahasrotus

According to Acharya Charaka, Vrushana (testis) and Medru (penis) are the moolas (prabhavasthana/place of origin) of Shukravaha srotus³⁴, whereas Acharya Sushruta considers stana (breasts) and vrushana (testis) as the moolas³⁵. While explaining Adhogami Dhamanis, Acharya Sushruta has mentioned two separate Dhamanis (Channels) for the genesis of shukra and two dhamanis to carry shukra to exterior³⁶. Acharya Madhavakara has explained vrushana as Phalakosha³⁷.

Place of shukra in shareera/Shukradharakala

Shukradharakala is the 7th Kala in the body, and Shukra is prevalent throughout the body as ghee in the milk, sugar in the sugarcane and oil in the sesame seeds. Shukra (semen) gets ejaculated through the ducts situated about two fingers breadth on either side (Parshwa) and just below the neck (bastidwara) of the bladder (basti). It comes out of the body through these ducts during sexual activities/desires, like water pouring out of a wet cloth^{38,39}. Based on this, shukra can be classified as adruhashukra (pervades entire body) and drushashukra (comes out to the exterior through ejaculatory ducts).

Shukrasthanagatkustha and Dusthashukrashonita janyakustha

According to Acharya Sushruta, "kaunyam (Kharabhangha/crippled state of hands), gatikshaya (loss of power of locomotion), anganambheda (Bhanga/ distortion of the limbs) and kshatasarpanam (spreading ulcers)" are the symptoms of kustha (skin disease) invading shukra dhatu (Shukrasthanagatkustha laxanas). Whereas "if the Shukra and Shonita of the parents are afflicted (undergone mutation) by kustharoga, the offspring born to such parents are likely to suffer from kustharoga (same kind of skin disease)"⁴⁰.

DISCUSSION

The human being is a multicellular organism and constitutes two primary cells, somatic cells and gonadal cells. Shukra pervades the entire body and is coextensive of the whole organism of humans. Beejartham (reproduction) is the supreme function attributed to shukra. Reproduction refers to the formation of new cells for tissue growth, repair or replacement (sukshmvayantaropatti), or the production of new individual⁴¹ (shareerantaropatti)⁴². Tissue growth, repair or replacement occurs through the division of cells and their subsequent enlargement. This division of cells is known as mitosis. Tissue repair replaces worn out, damaged, or dead cells. New cells originate by cell division from the stroma, the supporting connective tissue, or the parenchyma, which constitute the functioning part of the tissue or organ. Stem cells are primitive cells capable of self-renewal and differentiating into many specialised types of cells. The stem cell pool is not uniformly

distributed for four essential tissues (epithelial, connective, muscle, and nervous).

Similarly, regenerative capacity is not the same for these tissues in adults. Stem cells reside in protected locations in the epithelia of the skin and gastrointestinal tract to replenish the cells sloughed from the apical layer. Similarly, stem cells in bone marrow fill continuously to provide the supplementation of cells of the hemopoietic system. Even some connective tissue, such as bone, has a continuous renewal capacity. The stem cells in skeletal muscle are satellite cells that divide very slowly. Hence, muscular tissue's regenerative ability is poor compared to epithelial tissue. Cardiac muscle tissue lacks satellite cells, and existing cardiac muscle fibres do not undergo mitosis to form new cells. Nervous tissue has got the poorest capacity for regeneration though some stem cells are present in the brain. They usually do not undergo mitosis to replace the damaged cells⁴³. Like this, stem cells can accelerate tissue regeneration through various mechanisms. Growth or regeneration (repair) fails to occur in the event of failure of mitosis. As shukra is the last dhatu (most profound tissue) symptom of crippled fingers (kaunyam), restricted movements (gatikshaya), and spreading of ulcers (kshatasarpanam) are noticed when shukrastahana (shukradhara kala) gets afflicted by skin disease (Kustha dosha). The affliction of shukrastahana means affliction of a stem cell pool located in protected areas of the organs.

On the contrary, Gonadal cells are gametes (spermatozoa and oocyte) capable of uniting together sexually to form a new life. Gametes are produced by a particular type of cell division known as meiosis, in which a diploid cell is reduced to a haploid cell. Therefore, each parent makes an equal contribution to the hereditary characters of the child. Any change in the genetic material (mutation/upataptata) is inherited to the next generation. Therefore, if the Shukra and Shonita of the parents are afflicted (undergone mutation) by kustharoga (skin disease), the offspring born to such parents are likely to suffer from kustharoga.

Streeshukra is a controversial topic in Ayurveda. The human being is a jarayuja. The presence of matruja and pitrujabhavas is essential for the contribution of hereditary characters to the foetus. According to Acharya Dalhana, shukra is a somatic component derived as paternal inheritance common to all sexes like the Mamsadi dhatus⁴⁴. During the 7th week of gestation, shukrabahulyata leads to the generation of male sexual organs such as Vrushan (testis) and Medru (penis) from the genital ducts (Wolffian ducts). On the contrary, Artavabahulyata causes the development of female sexual organs Garbhashaya (uterus) and yoni (vagina).

Shukra flows to the exterior through the vrushan and medru as it possesses pravana (moving to the exterior from the point of higher concentration) guna. Vrushan is referred to as "phalakosha" by Acharya Madhavakar in the context of Andavruddi. Phalakosha is a place the seeds are formed and stored. Acharya Sharangadhara has mentioned Vrushana as the root (Adhara) for the paurushavahishiras. Kashiramvaiddya clears it as a channel carrying a mixture of semen and spermatozoa⁴⁵. Lingam (Medru) is the organ facilitating conception which carries mootra (urine) and beejayuktashukra (semen)⁴⁶. Hence, shukra, while moving to the exterior through the shukravaha srotus (vrushan/phalakosha and medru), moves along with the beejas (spermatozoa) for the purpose of fertilisation as women do not possess the phalakosha/ducts/channels to take the shukra to the exterior, shukra functions as a somatic component which cannot be inherited. Hence, a product of conception resulting from sexual activities between two women will be devoid of the pitrujabhavas (paternal inheritance). The discrepancy about the existence of

shukra in the female body by considering the vrushana and medru as moolas of shukravahasrotus is cleared by Acharya Sushruta and Vagbhata, stating majja, muska and stana as the moolas of same⁴⁷.

Some scholars in Ayurveda consider streeshukra as Artava, which is not so. Artava is the upadhatu of Rasadhatu, formed on the seventh day along with the rasa, whereas shukra is a dhatu. Acharya Dalhana has mentioned Artava (beejaroopi Artava), which is secreted in the Garbhashaya after removing the purana artava (menstrual flow)⁴⁸. Separate srotuses (channels) have been mentioned in classics as Artavahasrotuses to carry the artava. Artava is anityabhava, which appears at the age of 12 years and disappears at 50 years in the females. At the same time, shukra is a nityabhava (present since birth), a dhatu in both the sexes and even in eunuchs. Moreover, Artava is the component that carries the hereditary characters from the maternal side to the resultant foetus. Hence, Artava and Stree shukra shouldn't be considered as same.

Before adolescence, Shukra is invisible in males, like the fragrance absent in the budding flowers. Sushruta holds shukra as responsible for the appearance of roma (pubic hair), development of stana (breast), Artava (ovum) in females and smashru (beard, pubic hairs) and others in males⁴⁹. Adrenal androgens are continuously secreted in both males and females. The adrenal androgens also exert mild effects in females, not only before puberty but also throughout life. Androgens, primary testosterone, gets converted into estradiol by aromatase in the female body. In the male, androgens are secreted in abundance after adolescence by the interstitial cells of the Leydig cells of the testis, which help in spermatogenesis. Even the persons undergoing Vasectomy cannot produce offspring though they remain active sexually.

Sex hormones play a significant role in age-related wound healing deficits. Compared with aged females, aged males have been shown to have delayed healing of acute wounds. A partial explanation for this is female oestrogens (estrone and 17 Beta Oestradiol), male androgens (testosterone, 5 alpha dihydrotestosterone DHT), and their steroid precursor dehydroepiandrosterone have significant effects on the wound healing process⁵⁰. Thus, stem cell pools and androgens play an essential role in dividing somatic cells and tissue regeneration.

CONCLUSION

Shukra, either dhaturroopi or beejaroorpi, is necessarily a paternal inheritance. Dhaturroopishukra is the somatic component that supports and sustains the body and helps in tissue regeneration through mitotic cell division. Beejaroopishukra is a male gamete that carries the paternal inheritance to the offspring. Streeshukra is the somatic component derived from the other dhatus and essential for the existence of the female body (as per the sapta dhatu siddhanata). Beejarupiartava is the female gamete carrying maternal inheritance to the offspring. Vrushana (testis) and medru (penis) are the moola of shukravaha srotus carrying the gametic component (beejaroopishukra) to the exterior. Stana (breast) and majja (bone marrow) are the moolas of shukravahasrotus carrying the somatic component (dhaturroopishukra). Detailed explanations regarding the genesis of beejarupi shukra (spermatogenesis) are missing in Ayurvedic texts.

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