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Retas Pareeksha (Semen Analysis) - an ancient Ayurvedic tool for assessment of Genetic and Non Genetic causes of Male Infertility

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ABSTRACT

The analysis of human semen remains, especially in developing countries, the cornerstone of male fertility investigations, and therefore laboratory technician quality assurance should be handled with great responsibility. Although many laboratories claim to use the World Health Organization (WHO) manual for the analysis of human semen as a guideline¹. It is observed that the modern method of semen analysis have low predictive power because of lack of technology to precisely assess the pregnancy inducing capability of the sperm and inherent variability in semen quantity among the men. Also, it has been commonly reported in the recent studies that men are showing good semen parameters and still not able to conceive after a long non protective relationship². Ayurveda gives prime importance to maintain good health as well as happiness³. For happiness and harmony of life it is necessary to achieve all the goals of life. Progeny is the essential part of human life along with happiness. Ayurveda classics had explained Klibhya⁴, Napumsak and Shukra⁵ dhatu dosha concepts pertaining to male infertility. The main cause of male infertility is related to semen abnormalities known as Shukra dhatu dosha in Ayurveda. For the assessment of morbidities in shukra dhatu the Retas Pareeksha⁶ (Semen examination) is being used in world most ancient and rational system i.e. Ayurveda, described very vividly along with its procedures in Charaka Samhita.

Keywords: Ayurveda, Male Infertility, Retas Pareeksha, Semen examination.

Introduction

Ayurveda, the Medical science is the most rational, evidence based and scientific amongst the ancient systems of medicine. The main aim of Ayurveda is to acquire swasthya, the basis to achieve the four purushartha (Goal of Life) i.e. Dharma, Artha, Kama and Moksha. The achievement of each of these is the basic goal of life. The concept of kama reveals that the recreational aspects like pleasure are equally important to its procreation aspects⁷. The healthy sexual functioning plays essential role in maintaining the harmony and happiness in marital life. It provides a media to express love, which is the base for all sort of creative activities. The absence of which hampers the marital relationship leaving to frustration sometime ends into divorce and causes inadequacy in performing the routine duties. Ayurvedic definition of Health - doshas must be in equilibrium, the digestive fire (Agni) must be in a balanced state and the tissues (dhatus) and malas (wastes) must work in a normal state associated with the pleasant status of sensory organs, mind and atma (Cosmic soul). Such a person is called a Swastha (healthy person) ⁸. The health status of individual is defined by comparison to physiological parameters i.e. sharirakriyatmak parameters (physical parameters) which are mentioned above. The balance of Dhatu is called as *dhatusamya* is one of the important parameter of healthy person. According to Ayurveda there are seven *dhatus* in a person, these are rasa, rakta, mamsa, meda, asthi, majja and shukra (seven constructive unit of human body)⁹. As shukra dhatu is end product of dhatu parinama (end product). Hence its level in body has to be maintained very carefully by consuming nourishing foods and leading a healthy life. Shukra dhatu has to be protected to keep body healthy. Adopting healthy lifestyle, consuming healthy food and practicing healthy sexual life, help to protect shukra dhatu and opposite leads to shukra kshaya. Shukra kshaya leads to sexual diseases in the form of infertility¹⁰. This has been reported that the men suffering with sexual problems have low self-esteem, depressed and decreased quality of life⁸. Ayurveda gives prime importance to maintain good health as well as happiness. For happiness and harmony of life it is necessary to achieve all the goals of life. Creation and recreation is basic design of nature, hence progeny is essential to fulfill the aim of human life on earth¹¹. The various terms has been described in the ancient literature pertaining to the Shukra but most appropriate word is to being used by Acharya Charak while describing the natural process of conception/fertilization in Charak Samhita Sharir sthan, chapter three - i.e.-Retas is defined as a biological substance secretes from male partner. After the ejaculation it goes to ring in the ampulla of the fallopian tube and fuse with an ovum and ultimately results the formation of zygote cell¹².

Properties of Semen as per Ayurveda

As per Ayurvedic literature mentioned in Samhita the Shukra is unctuous, dense, slimy, sweet and white just like a piece of alum crystal. Shukra possess same physiological feature as of sperm¹³. The roots of Sukravaha srotas are mentioned as the vrushana and shepha¹⁴. The qualities attributed for good quality Retas are Snigdha, Madhura, Shveta, Bahal, Guru, Madhur Gandhi, Tailabham etc¹⁴. The appropriate production, transformation and pravartan (Ejaculation) of Shukra dhatu is required for fertilization. Any disturbance in this Psycho- somatic endocrinal mechanism leads to Retas dosha and ultimately which cause Infertility.

Morbidities of Semen

Ayurveda classics excellently described formation, features, and functions of normal Retas. Among etiopathogenesis of Reto dusthi eight types of physico- chemical features for the diagnostic cause of infertility is described in Ayurveda¹⁵. The eight Retas doshas described in classics are Phenila (frothy), Tanu (thin), Ruksha (dry), Vivarna (discolored), Ati- Picchila (hyper- viscous), Putipuya (pyospermia), Anyadhatusamsrista (associated with tissue components). Though recent developed technologies are important to diagnosis clinical or sub clinical conditions of male infertility. Still idiopathic term is being used in some undefined infertility cases¹⁶. Therefore, Semen analysis as per Ayurveda could be a new approach that can help to detect the abnormal semen from the normal one. The standardized tools to examine eight-fold abnormalities of semen will help to plan appropriate pharmacotherapy. Appropriate understanding of eight morbidities of Semen (Shukra) from current perspective is necessary to deal the problems in infertility.

Assessment of morbidities of Semen by Retas Pareeksha

As per the guidelines narrated in most ancient science based Indian traditional medicinal system that is Ayurveda and his novel commentator by Charaka, the assessment of Semen morbidities specially genetic and non genetic can be accessed through deep assessment of retas Pareeksha. The protocol and methodologies for Retas Pareeksha being described by Acharya can be de coated or elaborated as below

Pre examination procedure and Instructions- The cases were undergoing any of aphrodisiac therapy of other convention therapy must be stop for a period of minimum seven days along with complete abstinence of cautious must be necessary before collection the sample for the Retas examination. The other general advices for the subject is to stop taking alcohol, avoid opoidal and narcotic drugs if they can, take plenty of purified water, drink cold milk along with almond, use cow clarified butter, use black gram and Red Lentil with proper eight hours sleep.

Examination procedure -

It is evident and self-proved that Ayurveda considered physico- chemical features for the analysis of semen. For example, color, consistency, viscosity, density, smell, liquefaction time, etc. Explanation of possible mechanism or the scientific basis/background for each condition mentioned in Ayurveda has been elaborated here¹⁷.

- I. **Phenila (frothy)** – Presence of surfactants may be considered in this regard. It has been reported that surface – acting agents causes irreversible change in sperm surface and interact with membrane lipoproteins by which cell permeability increases and leakage of vital intracellular constituents ensues. Aquarium bubbler can be used to produce foam in semen sample after liquefaction^{18,19}.
- II. **Tanu (thin)** – thin and translucent semen sample are seen in case of Azoospermia or sever Oligozoospermia. Sperm count and translucency are inversely proportional; hence sperm count may be taken as a parameter for tanu.
- III. **Ruksha (dryness)** – As semen is in liquid form, **dryness cannot be demonstrated. As per** Ayurveda the buttermilk is ruksha, it may be understood that the material need not be physically dry rather it must exert dryness on administration. From this concept it may state that increased pH of seminal plasma may be stated be considered as ruksha as at this pH. Hence ph of semen may be counted by using developed method²⁰.
- IV. **Vivarna (discolored)** – As per Ayurvedic concept other than grayish white i.e. Sveta (milky white), Pita (yellowish white), Aruna (reddish), Krishna (blackish) and Nila (bluish) are described as abnormal colors of semen.
- V. **Ati-picchila (hyper viscosity)** – increased viscosity, i.e. tantubaddha²¹ (thread-like formation) is to be considered as ati-picchila retodusthi. Reduced levels of fructose in hyper viscosity

semen sample have been attributed to defective functioning of the seminal vesicles. For the assessment of tantubaddhata²², a capillary tube can be used²³.

- VI. **Puti – Puya (putrid and pyospermia)** - Puti means putrid smell and puya means pus and hence, this condition is indicative of pyospermia. This condition is predominant of pitta and kapha doshas²⁴. Chronic suppurative infection of Semen, where semen showing increased pus cell (5 > pus cells/HPF), are all included under puti-puya retodusti.
- VII. **Anayadhatu Samsritha – (presence of other than reproductive tissue component)** - Apart from spermatozoa, semen contains precursor cells, macrophages, mucus threads, crystals, gelatinous bodies, bacterial matter and RBCs also, which are all considered as anyadhatu²⁴.
- VIII. **Avasadi (sedimentation)** - Normal semen disperses when added to water, the semen sample which is not dispersed in water and the drop of semen either suspended or settled to bottom without dispersion may be considered as avashadi retodusthi²⁴.

Guidelines for Identifying Abnormal Sperm

Head defects include large, small, tapered, pyriform, round, and amorphous heads, acuated heads (>20% of the head area occupied by unstained vacuolar areas), heads with small acrosomal area (<40% of head area), and double heads, or any combination of these²⁵.

Neck and midpiece defects include “bent” neck (neck and tail form a >90 - degree angle to the long axis of the head), asymmetric insertion of the midpiece into the head, thick or irregular midpiece, abnormally thin midpiece (i.e., no mitochondrial sheath), or any combination of these. Tail defects include short, multiple, hairpin, broken tails, bent tails (>90 degrees), tails of irregular width, coded tails, or any combination of these²⁶.

Genetic causes of male infertility.

Genetic causes account for 10-15% of severe male infertility, including chromosomal aberrations and single gene mutations²⁷. Natural selection prevents the transmission of mutations causing infertility, while this protective mechanism may be overcome by assisted reproduction techniques. Consequently the identification of genetic factors has become good practice for appropriate management of the infertile couple. (et.al.) Infertility is a major health problem today, affecting about 15.0% of couples presently. Impaired fertility of the male is causative in 20.0% of infertile couples and contributory in up to another 30.0–40.0%. Infertility already affects about 5.0–7.0% of the general male population and may further increase in the future, considering the apparent trend of declining sperm count in industrialized countries. Despite enormous progress in the understanding of human reproductive physiology, the underlying cause of male infertility remains undefined in about 50.0% of cases, which are referred to as idiopathic infertility²⁸. Most idiopathic cases are likely to be of genetic origin because the number of genes involved in human spermatogenesis is probably over 1 thousands²⁹. (D Plaseska-Karanfilska et.al.)

The Caraka Samhita vividly explains descriptions regarding the genetic basis of diseases³⁰, that the human body in its entirety is represented in a seed form in the male and female reproductive elements. The complete blue print is called a Bija, which is composed of many components called the Bijabhagas. The Bijabhagas are further made up of smaller parts called as the Bijabhagas avayavas. Each organ of the body is formed from specific Bijabhagas or Bijabhagas avayavas³¹. Such Bijabhagas or Bijabhagas avayavas are called as janakas (progenitors) of specific structures of the body. The ancient science documentary Charak Samhita explains about specificity of the transmission of genetic information from a human being. Ayurveda provides knowledge regarding compare the divisions of the human genetic material into the Bija, Bijabhagas and Bijabhagavayava with the Chromosome, DNA and Gene described in modern genetics³². Any defective in Bija, Bijabhagas and Bijabhagavayava can cause partial or total defects or absence of specific organs or parts of the body. Birth defects have been also listed in Ayurvedic texts attributing defects of Bijabhagas and Bijabhagavayava as the underlying cause. Blindness by birth and sexual anomalies are examples. Classical Ayurvedic texts mention about genetic disorders with various terms like saharogas, kulajarogas or adhibala pravrittaroga. Diseases like haemorrhoids, certain skin diseases and diabetes are some of the diseases that have been considered to be inherited in Ayurveda. Sahajaroga means that which is present from birth³³ (Agniveśa et al. 2013), Kulajaroga means that which runs in families³⁴ (Agniveśa et al. 2013) and adhibalapravttaroga³⁵ (Dhanvantari et al. 2008) means that which arises from defects in the male and female reproductive elements. There are also many anomalies at birth which have been traced to have genetic origins in Ayurveda.

Effective formation of Semen, Genetic material transmission in respect to health and disease was described in the early stages of the evolutionary history of Ayurveda. The earliest Ayurvedic texts discussed about the

genetic basis of diseases and illustrate the examples of various diseases due to the genetic abnormalities. Ayurveda upholds the Indian tradition of marrying outside the gotra and the gotra system prevents inbreeding and completely eliminates all recessive defective genes from the DNA. Whereas, Ayurveda also illustrated the various diagnostic tools like mechanisms, procedures and techniques for various diseases^{36,37}

Conclusion

Retas Pareeksha is one of the important tool to assess the quality and quantity of Shukra dhatu. Retas Pareeksha can benefit the Infertile or sub-fertile cases in the early stages, already they are undergoing any therapeutics for the same. Therefore in this article it is aimed to illustrate a stronger correlation between ancient terminologies to the recent modern terminology. So that we can further give clues and prospects to upcoming research studies pertaining to male infertility from Ayurvedic perspective in relation to genetics concept mentioned in Modern medicine.

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