Study of Rasayana Chikitsa through Dhatu Parinaama Nyaya W.S.R. to Stem Cells

Sreelekshmi G1,2, Navoday Raju N R2,2, Raole Vaidehi3

1Department of Kriya Sharir, Pankajakasthuri Ayurveda Medical College and Research Centre, Thiruvananthapuram, Kerala, India
2Department of Kriya Sharir, Parul Institute of Ayurved, Parul University, Vadodara, Gujarat, India
3Department of Kriya Sharir, Dean of Academics, Parul Institute of Ayurved, Parul University, Vadodara, Gujarat, India

ABSTRACT

Stem cells are special cells that attain an ability to become various types of cells, present in an embryo as well as in an adult. These cells are used to replace and regenerate new organs, tissues or even an entire organism due to their self-renewing, uni or pluripotent properties. In Ayurvedic concept, the Dhatu are developing and nourishing in a sequential manner based on the Dhatu Parinama Nyaya (Law of Transportation and Transformation). Each Dhatu or bodily tissue is formed from either Ahaara Rasa or from the elements of previous Dhatu and gives rise to the formation of next Dhatu (Sookshma Dhatu). Hence, Sookshma (minute) Dhatu or Stem cells in a particular Dhatu can be comparable to stem cells because their ability to generate the different tissues. The aim of this article is to provide an awareness about the stem cells or Sookshma Dhatu in the light of concept of Dhatu Parinama Nyaya.

INTRODUCTION

Stem cells are special group of cells that have unique ability to develop into specialised cells. They are present in several tissues of multicellular organisms such as in blood, blood vessels, skeletal muscle, liver, skin, brain, bone marrow and so on (Chakraborty and Agoramoothy, 2012). The embryonic stem cells, collected from the inner cell mass of blastocyst are pluripotent in nature. Stem cells from umbilical cord, adult stem cells from bone marrow, haemopoietic stem cells are somatic stem cells, which are multipotent progenitor cells (Mohan, 2010). If any damage occurs to any parts of the body, the stem cells through the process of differentiation and repair replace the old cells. This property of stem cells is used in cell replacement therapies. Recent studies proved that the adult stem cells could develop into nerve cells, liver cells, skeletal cells, cardiac cells, adipose cells and so on. Hence, the stem cells form potent resources for transplantation therapies.

Thousands of years ago Ayurveda Acharya had classified the Ayurvedic science into eight branches on treatment point of view and among them the Rasayana Chikitsa or Rejuvenation therapy offers treatments against the premature aging or it delays the age of a person physically by providing and improving the health, strength and immunity. In this particular branch of Chikitsa (therapy), Acharya had suggested several medicines, daily regimens such as Dinacharya (daily routine), Ritucharya (seasonal regimen), Achara Rasayana (behavioural therapy) and so on. If a person practices such Rasayana
Chikitsa, for well being, the medicines rejuvenate the body from the minutest level, that is from the Agni level (enzymes helpful in cellular metabolism) and improve the functions of Tridosha (Joshi and Bhonde, 2014) (3 humours), so that Uttarottara Dhatus Poshana (nourishment of next tissue) occurs properly. That is Dhatus Poshana occurs at the level of Sthoolaamsa (elements necessary for the formation of Dhatu proper) and Sookshmaamsa (elements develops from the Dhatu proper for the formation of next Dhatu) and finally, proper Dhatu (Tissue), Upadhatu (supporting tissue) and Mala (wastes) will be formed. (Joshi and Bhonde, 2014)

Aim and Objectives

1. To brief about stem cells.
2. To explain how the term Sookshma Dhatu can be correlated with stem cells.
3. To explain the concept of Dhatu Parinaama Nyaya

MATERIALS AND METHODS

In Ayurvedic classics the description on the concept of Soookshma Dhatu has been explained mainly in the commentaries. There are enough number of references regarding Rasayana therapies, Dhatu Parinaama and Poshana even in the Moola Grantha(main texts). An attempt has also been made to find the literature in the available online and offline sources such as textbooks or materials such as Charaka Samhita, Sushruta Samhita and Asthanga Sangraha.

Literary Review

Rasayana Chikitsa (Acharya, 2002) or Rejuvenation therapy is a unique branch of Ayurveda, where the word “Rasayana” means an excellent method of making, repairing and rejuvenating the bodily tissues such as Rasadi Dhatu. Rasayana therapy promote longevity, memory, Dhatu Poshana Karma (Sharma, 2006) Saptadhatu (seven bodily tissues) get formed and perform their normal functions such as providing strength, immunity or Vyadhikshamatava, Ojopala, Ayu or longevity and so on.

The principle behind Dhatus Poshana Nyaya explains different methods of utilization of Annarasa (essence of digested food) by the body under the influence of Dhavagni. (Agni present in seven dhatu that perform digestive or metabolic functions). (Agrawal et al, 2010)

Ahaara Rasa (Rasayana, 2012) (essence of digested food), initially gets transported through their particular Srotas (channels), where under the action of Rasadhavagni (enzymes or substances that are necessary to nourish the first dhatu), get transformed into the first main Dhatu i.e. the Rasa Dhatu and its Upadhatu. The specificity of Dhavagni is that one Dhavagni is concerned with the synthesis of one Dhatu only but not any other Dhatu. In this way the Sthooolaamsa (main component) or Sthyaayi portion of Rasa Dhatu is formed along with Asthaayi Rasa Dhatu or Sookshmaamsa. Such Asthaayi dhatu will be responsible for the formation of next Dhatu. Under some favourable conditions in presence of various factors, it gets transported to other channels like Raktavahasrotas, where under the influence of Rakta Dhavagni, gets transformed into the next level Dhatu – Sthyaayi Rakta Dhatu. In this transformation process, along with Rakta Dhavagni, Ranjaka Pitta (a type of Pitta Doshah) also plays a crucial role. Thus, Sthyaayi Rakta Dhatu Poshana (Dhatu proper) occurs. Asthaayi Rakta Dhatu formed here undergoes transportation and transformation for the next level Dhatu formation.

In this way, Uttarottara Dhatu (next level tissues) or Saptadhatu Nirmana and Poshana (production and nourishment of seven tissues) occurs in a sequential manner along with their Upadhatu and Mala Roopi products (waste products).

While explaining Dhatu Poshana, Acharya (Scholars) always keep a sequence like Rasa-Rakta- Mamsa-Meda- Asthi- Majja- Shukra. (Murthy, 2004) This sequence reminds us about the formation of one Dhatu from the Sookshmaamsa of previous Dhatu.

DISCUSSION

Now we need to think what could be this Sookshmaamsa mentioned by our Acharya years ago. Based on several recent experimental studies done by the worldwide researchers, stem cells are found to have the property to differentiate into various cell types and they offer the possibility of a renewable source of cellular replacement.

The two main sources of stem cells are somatic stem cells found in adult body cells and embryonic stem cells from the embryo. Few years before the mesenchymal stem cells believed to be existed in bone marrow only. But the recent studies proved its existence in adipose tissue, umbilical cord tissues, molar teeth and amniotic fluid also (Miana and González, 2018). Such Multipotent stem cells are found to have various therapeutic purposes and used in tissue regeneration procedures, since they can self-replicate and self-renew under the influence of proper stimulants. (Chakraborty and Agoramooorthy, 2012)
The pluripotent embryonic stem cells differentiate into primary germ layers, from which the different tissues and organs develop. Hence, embryonic stem cells have more advantages than adult stem cells.

These all shows that a phenomenon known as transformation always occur in our body, where one type of tissue completely or partially get transformed into another type under favourable conditions such as the development of organs from embryonic stem cells.

Various research studies reported recently that we can experimentally transform one type of somatic adult cells into another type through a phenomenon known as plasticity (Wagers and Weissman, 2004). In such experiments the researchers were able to transform blood cells into neurons, blood cells into cardiac cells, adipose tissue into cartilage cells, bone marrow and so on. Few studies showed the ability of a single adult stem cell to become multiple tissue types as reported in ‘stem cells and development’. In the same year, the researchers were able to isolate stem cells from human skin, expanded them in the laboratory and coaxed them into fat, muscle and bone cells (Miana and González, 2018). Recently scientists have successfully made immature sperm cells from human bone marrow samples (University of Newcastle upon Tyne, 2007). It is a proof that fat is an excellent source for bone, cartilage. Advances in medical science have proposed that adipose tissue stimulates bone growth in children and young adults.

These experiments show the presence of some nutritive components or Sookshmaamsha of different Dhatu in other Dhatu (tissues) as mentioned by ancient scholars.

Several experiments on umbilical cord blood also on peripheral blood cells has been done, where it can be observed the conversion of blood cells into cardiac tissues (Perry and Roth, 2003) i.e. formation of Mamsa Dhatu from Rakta Dhatu, adipose tissue into osteogenic cells (Hattori et al., 2004) i.e. Medo Dhatu into Asthi Dhatu, bone marrow into sperm cells (University of Newcastle upon Tyne, 2007) i.e. Majja Dhatu into Shukra Dhatu and so on. Among the 4 methods of Nyaya the Ksheera Dadhi Nyaya (Law of Transformation) explains the transformation of one tissue into another in a particular sequence by the activity of the respective Dhatvaagni. (Antony, 2019)

Even though we observed these conversions experimentally under laboratory environments, these all changes happen in our body unknowingly under the influence of several factors such as growth factors, vitamins, minerals, hormones and so on, which stresses upon the role of progenitor cells or stem cells having multipotent or pluripotent or unipotent actions (Murthy, 2004; Wagers and Weissman, 2004) for the next tissue formation.

Hence, we can correlate the concept of Sookshmaamsha with the word stem cells or progenitor cells since from this Sookshmaamsha, the next Dhatu gets formed. But the word merely Sookshmaamsha, cannot be correlated with the term stem cells or progenitor cells. The all the factors that promote or stimulate or regulate a Dhatu or tissue for its formation or transformation can be considered under the term Sookshmaamsha.

In this way, Sookshmaamsha or stem cells form the basis of Rasayana Chikitsa because in Rasayana Chikitsa, the main objective is to regulate or improve the metabolic activities which in turn regulate tissue formation. Improving the levels of metabolites means improving or regulating the Agni, which involve Jatharaagni, Dhatavaagni and Bhootaaagni (Acharya, 2004). Once the Agni get corrected, there will be proper transportation and transformation of Ahaara Rasa and Bheshaja (medicines) through the Srotas. This will regulate the proper nourishment and formation of Sthoolamsa and Sookshmaamsa along with Upadhata Poshana.

Through the Rasayana therapy the regeneration of tissues can be improved both qualitatively and quantitatively, in which several nutrients, antioxidants, growth factors try to control the imbalanced Tridosha thereby nourishes and strengthen the Agni and Dhatu, thus making them a potent cellular resource. To prove the concept of Ksheera – Dadhi Nyaya, several research studies need to be conducted and such studies will surely lay strong base for healthy society. Once a proper study is done, we will be able to know the concept of Sookshma Dhatu and Dhatu Parinama Nyaya in a better way and that could be applicable in the treatment of various disorders like Dhatu Kshaya, Ojokshaya, Vyadhihamatva as well as in Rasayana therapy, where the cellular replacement and nourishment can be done without any surgical interventions.

CONCLUSIONS

The body undergoes changes and divisions throughout the day that leads to aging and finally deterioration. Hence, it should be protected with utmost care. Rasayana Therapy plays a vital role for the proper development of each bodily elements due to immunomodulatory effects. Utilising the concept of Sookshma Dhatu (stem cells) through
Dhatu Parinaama Nyaya in stem cell researches, definitely offers new potentials for treating various lifestyle, immune, neurological and metabolic disorders because of their unique regenerative abilities. Thus, the concept is very much essential in medical science.

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**Conflict of Interest**

The authors declare that they have no conflict of interest for this study.

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