AYURVEDA GENETIC AND APPROACH TO A SICKLE CELL DISEASE

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ABSTRACT

Sickle cell anemia is a genetic disease in which body produces abnormally shaped red blood cells. People with the disease are born with two sickle cell genes, one from each parent. Occurrence of single sickle cell gene, it’s called sickle cell trait. The most common symptoms are pain, anemia and its complication. It is an outstanding contribution of Ayurveda on genetics is being described as concept of basic unit of genetics viz. Beeja –Beejabhaga –Beejabhgavayava, Shadbhava, concept of mutation, inheriting factors, concept of fertilization and sex determination, description of congenital diseases like Madhumeha, Arsha, Kustha etc.[1] Proper Beejshuddhi of the parents is an essential prerequisite for a healthy progeny. Ayurveda described various vyadhi types, some of those are Aadibala Pravritta & Janma Bala Pravritta Vyadhi. This Vyadhi are occurred due to Matrija and PitrjaDosha at the time of Maithuna(coitus),vitiated Beeja or Beeja Bhaga producing blood and blood cells lead to Sickle cell disease and also due to vitiated Beejaand Beeja Bhagavayava organ of Rakta (Yakrut and Pleeha) and vitiated organ can occur sickle cell disease. Treatment of sickle cell disease or other related genetic disorder is already mentioned in Ayurveda. Description of Atulyagotriya Vivaha and such other measures for Prevention of diseases like Sickle cell and other Genetic disease via offspring.
KEYWORDS: Ayurveda genetics, Pleeha, Rakta, sickle cell disease, Yakrita.

INTRODUCTION
Ayurveda perspective of sickle cell disease can easily understand with the normal Rakta and RaktaUtpatti in the womb. Knowledge of genetic background for better understanding of RaktaDhatu and RatavahaSrotas Vyadhi like sickle cell disease is very essential for management of sickle cell crisis, and compactions. Generally Sickle cell anemia is a disease of Rakta and organ realated to Raktavahstrotas, viz. Yakrut and Pleeha. Whenever there is vitiation in the Bija or Bijabhaga or Bijabahagavayava responsible for controlling the formation of Rakta, Yakrita and Pliaphysiological work of these organs and Rakta Dhatu gets hampered therefore human body produces RBCs with different pathological shapes like sickle cells. In addition there are certain complications of disease like vaso-occlusive crisis, hand foot syndrome, jaundice, etc. which also shows close similarities of Ayurveda disease and can be managed independently too with Ayurveda therapies. For prevention of this disease there is a crucial role of prenatal counseling and following the Ayurveda protocol to maintain the purity of Bija, Bijabhaga, Bijabhagavayava for formation of healthy Yakrita, Pleeha and RaktaDhatu to prevent the sickle cell anemic baby. In Ayurvedic science they give full description about pathology about vitiation of organ. Part of the seed (sperm & ovum) which is responsible for the formation of a particular organ is vitiated, this will result in the vitiation of the respective organ. If it is not vitiated, there would be no vitiation of organ. And therefore in sickle cell disease liver and spleen are most affected organ. If defects in seeds (sperm & ovum) actions associated with soul, uterus, time, and food as well as regimen of the mother, Dosas get variously vitiated and this results in the impairments of the shape, color, and sensory as well as motor organ of the offspring. Factors which lead to deformity and not complete destruction are now being described. If the woman conceived when her ovum and uterus were not completely vitiated but simply afflicted by the circulating Dosas aggravated because of her indulgence in Dosas aggravating regimens, one or many of the organ of fetus derived from the maternal source, viz skin, blood etc. get deformed. These vitiated Dosas may afflict the Beeja or Beejabhaga by which the corresponding organs derived from these Beejas and Beejabhaga get deformed.

These are atomic units by which different organs of the body and varied traits develop. They are innumerable and can’t be counted. They are extremely subtle and are beyond sensory perception. When the Beejabhaga in the ovum of the mother which is responsible for the
production of uterus is excessively vitiated, then she gives birth to a sterile child. When the Beejabhagavaya in the ovum of mother which is responsible for production of uterus is excessively vitiated, then she gives birth to a Putipraja.\textsuperscript{[2]}

These deformities are caused by vitiation of ovum similarly when the part of the Beeja which is responsible for the production of the sperm in the fetus is excessively vitiated, then this gives birth to a sterile child. When the Beejabhagavayav which is vitiated then this gives birth to a Putipraja. When the Beejabhagaavayava which is responsible for the production of sperm and also portion of Beejabhagas which is production of organ that characterize a male, are excessively vitiated then this gives birth to a child who is not a complete male but only having masculine characteristic in abundance such a type of child is known as Trunputrika. In chakrapani has clearly stated that it is a smallest unit founding in shukra and shonita which can be considered as a Beeja of male and female respectively. The Beejabhag is the component lying inside holding responsibility of development of different body organs. the Beejabhagavayava should be taken as further more subtle stage of Beejabhaga carrying hereditary characters.

AIM AND OBJECTIVE
1. To discuss on the genetic approach of sickle cell disease in Ayurveda
2. To discuss about prevention of sickle cell disease.

MATERIAL AND METHOD
This article is based on, various studies published in National, International index and non-index journal of Ayurveda medical sciences. Ayurvedic Samhitas and its relevant commentaries have referred to collect the material for the article. Text of modern medicine and biology science has also referred to collect material for this article.
Role of *Mahabhuta*

<table>
<thead>
<tr>
<th>Mahabhuta</th>
<th>Function on Garbha</th>
<th>Components</th>
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<tbody>
<tr>
<td></td>
<td>Garbhopnisat</td>
<td>Charak/Sushrut/Kashyapa/Vagbhatta</td>
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<tr>
<td>Pruthvi</td>
<td>Dharaan</td>
<td>Smell, Olfactory organ, Solidity, Heaviness, Hair, Nails, Bone</td>
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<td></td>
<td>Pindikaran</td>
<td></td>
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<tr>
<td>Jala</td>
<td>Pindikaran (solidification)</td>
<td>Tounge, Flouds, heaviness, coldness, unctuousness, semen, blood, muscle, fat</td>
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<td></td>
<td>Kledana</td>
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<td>Teja</td>
<td>Prakashan</td>
<td>Complexion, Form, Temperature, Glow, Digestion, Intolerance, Velour, Brain</td>
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<td></td>
<td>Pachan</td>
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<tr>
<td>Vayu</td>
<td>Vibhajan</td>
<td>Touch, Lightness, Pulsation</td>
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<tr>
<td>Akash</td>
<td>Ayakash (vacuum formation)</td>
<td>Sound waves, Sense of hearings, Stomodeum, Throat, Koshtha</td>
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<td></td>
<td>Vivardhan</td>
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Role of Bhavas

<table>
<thead>
<tr>
<th>Bhava</th>
<th>Organ System</th>
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<tbody>
<tr>
<td>Matrujbhava</td>
<td>Skin&lt;br&gt;Blood&lt;br&gt;Muscle&lt;br&gt;Fat&lt;br&gt;Heart&lt;br&gt;Liver&lt;br&gt;Spleen&lt;br&gt;Bone marrow</td>
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<tr>
<td>PitrjBhava</td>
<td>Hair&lt;br&gt;Beard&lt;br&gt;Teeth&lt;br&gt;Bone&lt;br&gt;V,A,T&lt;br&gt;Nail</td>
</tr>
<tr>
<td>AtmajaBhava</td>
<td>Voice&lt;br&gt;Happiness and sorrow&lt;br&gt;Consciousness&lt;br&gt;Dhi&lt;br&gt;Dhruti&lt;br&gt;Smruti&lt;br&gt;Perception of indriya</td>
</tr>
<tr>
<td>Satmyajabhav</td>
<td>Freedom from disease&lt;br&gt;Constant happiness&lt;br&gt;Brain&lt;br&gt;Energy&lt;br&gt;Absence of idleness, greediness&lt;br&gt;High quality of oja</td>
</tr>
<tr>
<td>Rasa</td>
<td>Growth of body&lt;br&gt;Nourishment&lt;br&gt;Health</td>
</tr>
<tr>
<td>Satvaja Bhava</td>
<td>Jealousy&lt;br&gt;Fear&lt;br&gt;Anger&lt;br&gt;Cleanliness&lt;br&gt;Temper&lt;br&gt;Sacrifice&lt;br&gt;Belief in god&lt;br&gt;Devotion</td>
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**DISCUSSION**

When a woman after her menstruation cohabits with a man of a different clan in a lonely place, the man ejaculates something composed of four Mahabhutas and having six tastes, which results in conception in a woman.\(^2\)
Hereditary diseases are those which are caused by vitiated semen and ovum such as leprosy, piles, etc. They are also of two types, maternal and paternal. Congenital diseases occur due to unwholesome behavior of the mother such as child born as lame, blind, deaf, dumb, with nasal voice, dwarf etc.; these are also of two types, nutritional and the other due to unwholesome behavior during pregnancy; humeral diseases are those caused by disorders as well as faulty diet and behavior; these also are of two types, arise from stomach and that from intestine, again of two types – somatic and psychic. All these are biological.

The fetus is produced out of the mother without mother there is possibility of conception and birth of viviparous creatures. We shall hereafter describe those organs which are derived from the maternal source and which are formed because of the existence of the mother. They are skin, blood, flesh, fat, umbilicus, heart, Kloma, liver, spleen, kidney, bladder, rectum, stomach, Pakvasaya, upper and lower parts of the anus.

The fetus is produced from out of the father. Without father there is no possibility of conception and birth of viviparous creatures. We shall hereafter described those organs which are derived from paternal source and which are formed because of the existence of the father. They are hair of the head, hair of the face, nail, and small hair of body, teeth, bones, veins, ligaments, arteries, and semen.

The fetus produced out of the soul. The Antartman is the same as Garbhatman. This is known as Jiva or animated soul. According to religious scriptures, this soul is eternal. Soul does not get afflicted by disease and does not succumb to death. Thus the fetus takes the designation of soul.

The same fetus during the course of time, attains the state of childhood, youth and old age. According to the state attained by individual, he is stated to be born in those state of life but with reference to the state of life ahead, he is considered to be unborn or in the process of taking birth. Therefore, he is born and unborn simultaneously. In such situation where the soul is considered to be both born and being born, he produce that states of life after himself having taken birth. In other situations, where that state of body, is yet to come, the soul is considered to produce himself without being born. In those particular ages i.e. types of growth as well as in these particular state of living beings, the change of associated body is considered to be the birth of Atman. For example, the state of mere existence of sperm and ovum prior to be combination of the soul cannot be called as fetus. They are only entitled to
be known as fetus only when the soul gets combined with them. The existent man cannot be
called as a father prior to the birth of his offspring. He is considered to be the father only after
the birth of his offspring. Similarly, the existent fetus can be considered to be born or unborn
depending upon the state attained or to be attained by him.

The fetus is produced from out of the wholesomeness. There can’t be sterility of the man,
woman or defects in the fetus without resorting to unwholesomeness things. Human beings
are capable of procreating offspring as long as the sperm, ovum, and uterus of men and
women are not afflicted by the circulation of the three Doshas vitiated by the intake of
unwholesomeness things. Even during the period of fertilization, union of the men and
women who are giving to wholesomeness things and whose sperms, ovum and uterus are
unimpaired, do not produce the offspring if the soul does not enter into it. Therefore
wholesomeness alone is not responsible for the formation of fetus. It is the combination of all
factors which is responsible for production of the fetus. We shall here after describe these
aspects of the individual derived from wholesomeness and which are manifested because of
the existence of such wholesomeness. They are the state of freedom from diseases, laziness
and greed, clarity of senses, excellence of voice and seeds and excessive, sex-vigor.

Mind is also the connecting link which connects the soul with physical body. So, on the eve
of death when the mal behavior and inclinations, the sense organs are disturbed strength
diminishes and living beings devoid their inspiration from nothing but mind.

The objects of the senses are of the three types, viz. Sattvika, Rajasa and Tamasa. The mind
dominated by any of the above mentioned attributes in one life follows in the subsequent life
as well. When the individual is endowed with the Sattvika types of mind from his previous
life. Because of the continuity of the same mind, he can remember things of the past
incarnation, the individual is called Jatismara.

We shall hereafter described those aspects of the individual which are derived from mind and
which are manifested because of the existence of mind. They are liking conduct, purity,
enmity, memory, attachment, detachment, Matsarya, valor, fear, anger, drowsiness,
enthusiasm, sharpness, softness, seriousness, instability and such other manifestations of
mind which will be described later while discussing the various types of mind. All of them
occur in the same man but all of them are not manifested at the same time. An individual is
said to belong to that particular types of mind by which is dominated.
Vitiation of the Dosha explained earlier causes the vitiation of Matruja and Pitruja Beej either completely or partially and causes the occurrence of different genetic diseases with different traits and different expressions and variation.

At the end to summarize the session one can say that there is the vitiation of sperm or ovum with Dosha due to non-congenial diet and lifestyle causes the mutation, aberrations and different trisomy’s in offspring.

<table>
<thead>
<tr>
<th>Beej</th>
<th>Germinal cell</th>
<th>Sperm &amp; ovum</th>
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<tbody>
<tr>
<td>BeejabhagaDehaParmanu</td>
<td>Gene</td>
<td></td>
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<tr>
<td>Beejabhagavyaya</td>
<td>DNA</td>
<td></td>
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</tbody>
</table>

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<thead>
<tr>
<th>Trisomy’s or Monosomies – Beeja Dushti Vyadhi</th>
<th>Chromosomal aberrations – Beejabhaga Dushti Janya Vyadhi</th>
<th>Mutational – Beeja Bhagavyava Dushti Janya Vyadhi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downs Syndrome</td>
<td>47 XXX syndrome</td>
<td>Sickle cell disease</td>
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<tr>
<td>Edwards Syndrome</td>
<td>47 XXY syndrome</td>
<td>Inborn Errors of Metabolism</td>
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<tr>
<td>Patau Syndrome</td>
<td>Cat eye syndrome</td>
<td>Colorblindness</td>
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<tr>
<td>Kleinfilters syndrome</td>
<td>Jacobson syndrome</td>
<td>Thalassemia</td>
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<tr>
<td>Turner Syndrome</td>
<td>Smith magenis syndrome</td>
<td>Duchene Muscular Disease</td>
</tr>
</tbody>
</table>

CONCLUSION

Above all description are mentioned in our literatures and relation of all sutras are showed that Beeja, Beejabhaga and Beejabhagavyava are vitiated then different types of genetic disorders (trisomy, monosomy, chromosomal aberration’s and genetic mutational) are occurred. If proper care has not been followed in Garbhavashtha, then there is a chance of genetic diseases in progeny. Imbalance of Mahabhuta at the time of conception and after the conception causes the occurrence of sickle cell types of disorders in offspring. Most importantly, in same clan of parents are also one the cause of genetic diseases. In short Ayurveda described the basis of all kind of genetic disorders and preventions regarding that, in detailed and scientific manner.

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