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Conceptual study of Atulya gotra and consanguineous marriages

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Abstract

In Ayurveda consanguineous marriages that is *Sagotra vivah* mentioned and also mentioned the risk of such marriages. This article is the conceptual review of Ayurveda and modern text of *Sagotra vivah*. In this article one example of bleeding disorder -Hemophilia and its risk factor is also mentioned to elaborate the concept.

Key words: *Sagotra vivah*, consanguineous marriage, genetic disorder, hemophilia,

Introduction

In Ayurveda the genetic disorders are explained as *beej dushtijanya Vikara. Beej, Beejbhaga, Beejbhaga avayava* are identified as certain fundamental entities, which are responsible for reproduction. This is highly evolved concept of genetics which fortunately simulates with the contemporary concept of genetics dealt by Acharya Charak in Sharir Sthan1. For the healthy progeny i.e. *Santati*, Acharya mentioned importance of Six Procreative Factors (*Shadgarbhakarabhavas*) such as *Matrija* (maternal), *Pitrija* (paternal), *Atmaja* (Soul), *Rasaja* (Nutritional), *Satmyaja* (Wholesomeness), and *Sattvaja* (Psych / Mind). The conglomeration of these procreative factors is a must for healthy progeny. Healthy parents, practice of a wholesome regimen, and a healthy mind (Psychological status of parents) play a prime role in achieving a healthy offspring, thus structuring a healthy family, society, and nation. Each procreative factor is assigned with a certain organogenesis / functional / psychological phenomenon, to develop in the forthcoming *santati*, during its intrauterine life. A lag on the part of any of these *Shadgarbhakarabhavas* will lead to physical, functional or psychological defects, which can be contributed by the respective factor. There are many basic principles of Ayurveda which are applicable in current time. One important concept mentioned

in classical text is *Atulya Gotriya adhyaya*

Materials and Methods:

1. *Atulya Gotriya adhyaya* from *Charak Samhita*
2. Consanguineous marriages
3. Risk of Hemophilia in Consanguineous Marriages

Literature Review:

Atulya Gotriya Adhyay

The *"Atulya Gotriya Adhyay*" is the 4th chapter of the Charaka Samhita's "Sutra Sthana" section. This chapter focuses on:

1. Classification of individuals: Based on their physical characteristics, mental traits, and genetic predispositions.
2. Understanding individual constitutions: To provide personalized healthcare and treatment.

Key Concepts

Some key concepts discussed in this chapter include:

1. *Prakriti*: The unique constitution or nature of an individual.
2. *Vikriti*: The deviation or imbalance from one's natural constitution.
3. *Sharira*: The physical body and its various components.

Importance

The "*Atulya Gotriya Adhyay*" provides valuable insights into Ayurvedic philosophy and practice, emphasizing the importance of understanding individual constitutions for effective healthcare.

In *Ayurveda, Sgotra Vivaha* (सगोत्र विवाह) refers to marriage within the same *gotra* (clan or lineage). Here are some contraindications:

Contraindications

1. Genetic disorders: Marriage within the same gotra can increase the risk of genetic disorders, as the genetic pool is limited.

2. Prakriti imbalance: *Sgotra Vivaha* can lead to an imbalance of prakriti (individual constitution), potentially causing health issues.

3. Vikriti: Marriage within the same gotra can perpetuate vikriti (deviation from natural constitution), leading to physical and mental health problems.

4. Karmic influences: Ayurvedic texts suggest that *Sgotra Vivaha* can lead to karmic influences, affecting the couple's spiritual growth and well-being.

Ayurvedic texts references

1. *Charaka Samhita: Sutrasthana*, Chapter 4, Verse 8-10

2. *Ashtanga Hridayam: Sutrasthana*, Chapter 3, Verse 14-16

3. *Manu Smriti:* Chapter 3, Verse 5-7

Sexual intercourse within the same clan causes *adharma*, thus contraindicated in *dharmashastra*. [*Chakrapani on Cha. Sa. Sharira Sthana* 2/3] Hence *atulyagotra* implies non-consanguineous cohabitation.

In modern context *Sagotra Vivah means* Consanguine marriage . Consanguine marriage is marriage between individuals who are closely related. In a clinical sense, marriage between two family members who are second cousins or closer qualifies as consanguineous marriage. This is based on the gene copies their offspring may receive.

Multiple studies have established consanguinity as a high cause for birth defects and abnormalities. A risk of autosomal recessive disorders increases in offspring coming from consanguineous marriages due to the increased likelihood of receiving recessive genes from parents. According to population based case-control studies, a higher risk of stillbirth is associated with consanguineous marriages.[3]

Inbreeding is associated with decreased cognitive abilities in children.[4]

Younger ages of marriage are commonly seen in consanguineous marriages, which may account for the increase in fertility seen in these unions. Chances of postnatal mortality are higher in ne born babies. The first year holds the highest chance of death due to the risk of autosomal recessive genes. This is also the cause of health complications and genetic or congenital disorders , as children born from consanguinity enter adulthood.[13]

The primary medical concern with consanguineous marriages is the highest risk of genetic disorders. When closely related individuals reproduce, there is a higher probability that both parents carry the same genetic mutation. This situation increases the likelihood of recessive genetic disorders in their children. Recessive disorders, such as, thalassemia, hemophilia etc , occur only if a child inherits two copies of the mutant gene, one from each parent [6]. In consanguineous unions, the chances of both parents carrying the same recessive gene are significantly higher compared to non-consanguineous marriages. As a result, the incidence of autosomal recessive disorders is more frequent in populations where consanguinity is commonly practiced [7].

Moreover, consanguinity can lead to an increase in the expression of deleterious genes, leading to a reduction in overall genetic diversity within a family or community. This reduced genetic diversity can have broader implications beyond single-gene disorders [8]. It may affect complex traits and the overall health of the population, potentially leading to reduced immunity and increased susceptibility to infectious diseases. Additionally, the accumulation of deleterious mutations over generations can result in a higher prevalence of multifactorial diseases, such as heart disease and diabetes, which are influenced by both genetic and environmental factors [9]. Therefore, the implications of consanguineous marriages extend beyond the immediate risk of single-gene disorders, impacting the broader health and genetic resilience of communities where it is practiced. In this review, we aimed to discuss the current evidence regarding the association between consanguineous marriages and genetic disorders and concept of *Sagotra vivah* mentioned in Ayurvedic classical text.

Here is example of one of the bleeding disorder ,Hemophilia in consanguineous marrieges.

Risk of Hemophilia in Consanguineous Marriages

- 1. First cousins: Marriage between first cousins increases the risk of hemophilia by 2-3 times.
- 2. Uncle-niece or aunt-nephew: Marriage between an uncle and niece or aunt and nephew increases the risk of hemophilia by 4-6 times.

- 3. Double first cousins: Marriage between double first cousins (children of two siblings who marry two other siblings) increases the risk of hemophilia by 8-10 times.

Discussion

Why Consanguineous Marriage Increases Hemophilia Risk

1. Increased chance of inherited mutations: When close relatives marry, they are more likely to carry the same genetic mutations, including those that cause hemophilia.
2. Reduced genetic diversity: Consanguineous marriage reduces genetic diversity, making it more likely that recessive genes, like those that cause hemophilia, will be expressed.

Prevalence of Hemophilia in Consanguineous Marriages

1. Higher prevalence in certain populations: Consanguineous marriage is more common in certain populations, such as in some Middle Eastern and South Asian communities, where the prevalence of hemophilia may be higher.
2. Increased risk of severe hemophilia: Consanguineous marriage may increase the risk of severe hemophilia, as the likelihood of inheriting two copies of the mutated gene (one from each parent) is higher.

Genetic Counseling and Testing

1. Importance of genetic counseling: Couples who are considering consanguineous marriage should undergo genetic counseling to understand their risk of having a child with hemophilia.
2. Genetic testing: Genetic testing can identify carriers of hemophilia and help couples make informed decisions about their reproductive options.

It's essential to note that consanguineous marriage is not the sole cause of hemophilia, and many cases of hemophilia occur in families without a history of consanguineous marriage

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