

# Case Report on Consanguineous Marriage

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**Abstract:** *Marriage in Indian society is a religious duty. Consanguineous marriage is common, where individuals prefer to marry within their clan. Traditionally, some cultures have practiced and continue to practice marriage between relatives such as cousins, as a means of strengthening family ties and retaining property within the family. In India, the recent estimation of consanguinity rates vary from as low as 1- 4% in the northern region to as high as 40-50% in the southern region. In comparison to a non-consanguineous couple, consanguineous are more likely to have marriage, at early age. Consanguineous unions range from cousin-cousin to more distant relatedness, and their prevalence varies by culture. Consanguinity has been known to increase the chance of the husband and wife carrying an identical gene derived from a common ancestor. Children of such a marriage, therefore, are at greater risk of being homozygous for a harmful gene and consequently suffer autosomal recessive genetic disorders<sup>1</sup>. Pregnancy wastage has also been found to be high for women marrying close relatives<sup>1</sup>. Higher rates of birth; rates of abortion, postnatal mortality, congenital malformations and genetic disorder are evident among consanguineous couple.*

**Keywords:** Consanguineous marriage, Chronic Hypertension, SLIUF(Single Live Intra Uterine Fetus), Pitting edema, Polycystic kidney disease.

## 1. Introduction

Consanguineous marriage is a traditional practice in many communities around the world. It is defined as a marriage between two people who are second cousins or more closely related.<sup>1</sup> Literature reports a historically high prevalence among the Middle East countries, North Africa and South Asia accounting for 20-50% of all marriages. First cousin unions are more frequent comprising 20-30% of all marriages.<sup>2,3</sup> Blood related marriages have higher prevalence in Southern states of India.<sup>4</sup> This social custom is practiced mainly for religious and economic reasons.<sup>5</sup> In some religions marriages between first cousins and uncle niece is permitted, but not between brothers and sisters. Among the Hindu population of South India, about 30% of marriages are consanguineous; with 20+% between uncle niece unions.<sup>6</sup> Consanguineous unions are preferred in some communities as it is believed to strengthen family relations. The fear of marrying with stranger, maintenance of family property, requirement of less economic transaction (dowry) and cultural practices favor intra-familial marriages. Marriages within the relatives are also believed to be more stable, have better relationships with in-laws, favors the practice and continuity of cultural practices. Parents believe that in close kin relationships, physical traits of the bride will be less important and in-laws will be more caring and supportive.<sup>5</sup>

## 2. Case Report

A mother aged 24 years, with the obstetric history of G6 P2 L2 A3 at 37weeks and 2days was admitted to the birthing centre with SLIUF, chronic hypertension and decreased fetal movements. On physical examination, she had periorbital edema, ankle and pitting edema. Her weight was 98kg and blood pressure was 160/100mmHg. Blood investigation revealed she was anemic (Hb: 10gm/dl). She has a marital history of 13 years with her second cousin. Her obstetric history reveals that she was first conceived after a

year of her marriage and had given birth to a healthy newborn followed by a second normal delivery after one and half year. Following this, the mother experienced two missed abortions and then a medical termination of pregnancy due to the diagnosis of anencephaly during her USG.

Currently she was in her sixth pregnancy, which underwent a normal delivery after two doses of induction with cerviprime gel due to no progressive contractions. The newborn weight was 3.75kg. The neonate was diagnosed with polycystic kidney disease within 3 days of birth. Mother was treated with antihypertensive (calcium channel blockers and adrenergic receptor blockers) and strict monitoring of the mother and fetus was done throughout labour and follow up in the immediate post partum period. Later mother along with her husband was referred to the genetic counseling.

## 3. Discussion

Word 'Consanguinity' comes from two Latin words 'Con' meaning 'Shared' and 'Sanguis' that means 'blood'. Among the major population studies reported consanguinity is found to be associated with socio-economic levels, education and rural communities.<sup>5</sup> Brothers and sisters share commonly 50% of their genetic make-up. Uncle and niece share 25% and first cousins 12.5% of their inherited genetic material.<sup>7</sup> Hence, blood related marriages increase the risk of defective gene being transmitted to the children from the parents. Closer the biological relationship higher is the risk. Consanguinity is also reported to be associated with miscarriages.<sup>8</sup> A significant frequency has been reported between consanguinity and genetic disorders, congenital heart disease, multiple congenital anomalies, neurological malformations, chromosomal disorders and mental retardation.<sup>9</sup> Recent research has also shown genetic contribution to complex diseases.<sup>10</sup> Common adult disease like cancer, mental disorders, heart diseases, gastrointestinal disorders, hypertension, chronic renal failure, cystic fibrosis

hearing deficit Blood diseases (hemophilia, Thalassemia) and diabetes mellitus were more frequent among consanguineous marriages.<sup>10</sup>

Worldwide about 7.9 million children annually are born with a serious birth defect. India, with its vast population of 1.2 billion and approximately 27 million births per year, possibly contributes to about one fifth of these defects. Various risk factors that are associated with birth defects are advanced maternal age, maternal nutritional status, infections, medical illnesses maternal exposure to teratogenic drugs, and *consanguinity*.<sup>14,15</sup>

Study on Parental consanguinity as a cause for increased incidence of births defects with 238,942 consecutive births revealed that the risk for birth defects in the offspring of first-cousin mating are increased sharply compared to non consanguineous marriages. The Consanguineous mothers had more stillbirths than non consanguineous mothers. Literature proves marriage between the family relationships has higher risk of having offspring with birth defects. Different studies over-exaggerate when dealing on issues like intermarriages, the risk is "tolerable" when we consider the risk among first cousins approximately, between 5% – 6% (5 to 6 births out of every 100).<sup>11,12</sup>

The studies reviewing the rate of consanguinity among the populations of South India show that the rate ranges from 20% to 60%.<sup>13,14</sup> First cousin marriages (43.42%) were the most frequent type of consanguinity which is comparable with other studies.<sup>3</sup> Uncle-niece marriage and first-cousin unions have a long tradition in South India. In the Hindu Marriage Act of 1955, cross-cousin marriage was recognized and the legality of Uncle-niece marriages was confirmed in the Hindu Code Bill of 1984.<sup>15</sup>

Primordial and primary preventive measures are very essential in this context. Today's children are tomorrow's responsible citizen, and with this understanding, public education should be done at school level during adolescence to instill the biological risk of close marriages. Awareness to the parents of adolescents regarding genetics diseases and the risk of consanguineous marriage is essential. A law/act must be legislated in all the countries where consanguineous marriages are common. When blood relatives plan to marry, they should be compelled to undergo genetic counseling prior to marriage. Women over 40 years of age should be included in the category of high risk for genetic diseases and necessary genetic test must be done to her.

**Genetic Counseling:** This plays an essential element in preventing birth defects for neonate. The simplest and most comprehensive tool for providing genetic screening to consanguineous couples and their offspring is to obtain a medical family history covering 3 to 4 generations from the couple. A referral to a genetic counselor or medical geneticist is important to identify appropriate testing based on the family history and the ethnic background. In addition to taking a family history, offering appropriate carrier screening for autosomal recessive disorders (based on family history and ethnic background) is important.<sup>17</sup>

The screening plan for the offspring of parents related as second cousins or closer includes the following:

- During Pregnancy the test includes high-resolution ultrasound at 20 to 22 weeks, maternal-serum marker screening at 15 to 18 weeks.
- In Newborns in addition to the standard neonatal screening tests, supplemental neonatal screening by tandem mass spectrometry should be offered by the age of 1 week, with the goal of identifying potentially treatable inborn errors of metabolism.<sup>17</sup>

## 4. Conclusion

The offspring of consanguineous unions may be at increased risk for genetic disorders because of the expression of autosomal recessive gene mutations inherited from a common ancestor. The closer the biological relationship between parents, the greater is the probability that their offspring will inherit identical copies of one or more detrimental recessive genes. The role of multidisciplinary health care team is very essential for genetic counseling, testing and treatment. They should participate in the provision of care for women and newborns considering or undergoing genetic screening and treatment. They should be prepared to assist clients with accurate and complete information to enable them to make informed decisions related to genetic screening. The health care team must be prepared to work with patients in a manner that supports the decision-making process inherent to genetic screening or genetic evaluation.

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