

# Arranged marriage, consanguinity and epilepsy

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## Abstract

Arranged marriage is where parents choose marital partners for their children. It is a norm in many parts of Asia and Middle East. A marriage is said to be consanguineous where the marriages are solemnized among persons with close biological relations. There is considerable overlap in arranged and consanguineous marriages with many cultures adopting both practices. Recent studies showed that there is significantly higher rate of consanguinity of parents of epilepsy patients. There is also significantly higher rate of epilepsy among family members with consanguineous marriage for both cryptogenic and idiopathic epilepsies.

## ARRANGED MARRIAGE

Arranged marriage is defined as one where parents choose marital partners for their children and arranged marriage is a norm in many parts of Asia, Africa and Middle East. On the other hand non arranged marriages are common in the Western part of the world. In the modern world there is co-existence of both types of marriage system.

The total world population is around 6.5 billion, and 3.7 billions (60%) live in Asia. On the other hand, Oceania region comprising of Australia, New Zealand, Melanesia, Micronesia and Polynesia constitutes only 0.5% of the world population. In Asia, arranged marriage is particularly common in West and South Asia, Japan and rural areas in other parts of Asia. Thus, at least a third of Asians practice arranged marriage.

Arranged marriage should not be equated with forced marriage, which may result in cases of much publicized tragedies. As the arranged marriage is usually by the parents, the choice of partners usually reflects the values of the parents. Arranged marriage may be particularly important where there is less opportunities for social interactions between the sexes of marriageable age. The divorce rate among South Asians that widely practice arranged marriage is low. The practice is thus compatible with stable families.

A study was conducted on arranged marriages and consanguinity in the department of Neurology, G.B Pant Hospital, a tertiary care University Hospital, New Delhi, India. A total of 300 subjects were interviewed, comprising of subjects (both inpatients and outpatients), their caregivers and

hospital staff. Seventy four percent were above 30 years of age. Majority (77%) were men. The religions of the study subjects were: Hindu (75%), Muslim (22%), Sikh (2.5%) and Christian (0.5%). Education level was above 12 years in 61%. Seventy one percent were married. Most of the subjects interviewed (85%) had or were likely to have arranged marriage. The main reasons in favor of arranged marriage were to comply with the wish of the parents and to follow tradition.

## CONSANGUINITY

A marriage is said to be consanguineous where the marriages are solemnized among persons descending from the same stock or common ancestor with close biological relations.<sup>1</sup> All human societies however primitive or geographically isolated prohibit the mating of first degree relatives, namely that between parents and children and brothers and sisters, which is incest. Marriage between relatives less close than siblings or parents and offspring are not necessarily outlawed, but the dividing line between legal and illegal is hazy and varies between countries. In about one-half of USA, uncle-niece and aunt-nephew (second degree) and first cousins (third degree) mating are forbidden by law. In 1981 Marriage of the People's Republic of China, marriage between first cousin or closer was also prohibited. On the other hand, in India, marriages between uncle and niece is legal. It has been reported that in Bangalore and Mysore, two major cities of Karnataka state of South India, 21% of Hindu marriages were uncle-niece unions.<sup>2</sup>

Consanguineous marriage is particularly prevalent in Middle East, Pakistan, Muslims in India, Hindus in South India, Bangladesh and Sri Lanka, accounted for close to 50% of marriage in parts of Saudi Arabia and Pakistan.<sup>3</sup> It is also said to be common in parts of Japan accounting for 4% of marriages in an all-Japan survey.<sup>4</sup> In China, it is prevalent in some minority populations such as Tajik and Uzbek in Xinjiang. It is also prevalent among the Middle Eastern, Indian and Pakistan diasporas in Europe and North America.<sup>3</sup>

The preference to consanguineous marriage has been attributed to traditions, maintenance of family structure and property, strengthening of family ties, financial advantages relating to dowry, closer relationship between the wife and the in-laws, greater social compatibility, greater marriage stability and durability. Higher rates of consanguineous marriage have been associated with low socioeconomic status, illiteracy, and rural residence.<sup>3</sup>

A hospital based study from Pakistan showed high prevalence of consanguineous marriage among the population. The preference for consanguineous marriage is reflected in the quotation, "in arranged marriage", "it is healthy to marry within the family". Constrains of religion, status, caste, family differences and the fear of incompatibility were among the reasons quoted as difficulties in finding a mate outside the family. Security of knowing the mate in the family, culture and religion, and having more information about the mate before marriage were quoted as reasons for the continued popularity of consanguineous marriages in Pakistani population.<sup>1,5,6</sup>

### **RISK OF EPILEPSY AND OTHER DISEASES IN CONSANGUINEOUS MARRIAGE**

The detrimental health effects associated with consanguinity are caused by the expression of recessive genes inherited from a common ancestor(s). This probably applies to rare single gene conditions as well as to multigene disorders with multifactorial inheritance.

Recent study in the State of Qatar showed rate of consanguineous marriage was 54% with confidence limits of 52.3 – 55.7%. Bronchial asthma, mental retardation, epilepsy and diabetes were significantly more common in offspring of the consanguineous than non- consanguineous couples.<sup>7</sup> Evaluation of stroke in children at King Khalid University Hospital, Saudi Arabia showed that children with recurrent strokes were significantly more likely to be the product of consanguineous marriages ( $P=0.04$ ).<sup>8</sup>

In unrelated mating the probability of producing a child with a serious birth defect or mental retardation is 3 - 4 %. This figure doubles in first cousin mating and trebles in uncle - niece and aunt - nephew marriage. A recent review reported an increase in incidence of birth defects for first cousin progeny of 0.7 to 7.5% as compared to non-consanguineous couples, with the higher values recorded in more recent studies.<sup>9</sup>

As for risk of epilepsy from consanguinity, a study was done in Iran on 181 children and adolescents up to the age of 18 years with epilepsy over a 6 months period. The percentage of consanguinity in parents of the epilepsy patients was significantly higher in comparison to the general population (OR 2.6, 95% CI: 1.9-3.5,  $P<0.0001$ ), indicating that consanguinity as a risk factor for epilepsy. Overall, 33.7% were first cousins, (OR 2.26), and 20.7% were second cousins (OR 3.5).<sup>10</sup> Ramasundrum and Tan studied 316 epilepsy sufferers of Indian origin in Malaysia and showed that 29.5% of them had a parental consanguineous marriage. For the idiopathic and cryptogenic groups, there was a significantly higher rate of epilepsy among family members with consanguineous as compared to non-consanguineous parental marriage (Idiopathic epilepsy, RR=2.5, 95% CI 1.2-5.2,  $p=0.02$ ; Cryptogenic epilepsy, RR=3.0, 95% CI 1.8-5.1,  $p<0.001$ ). In the idiopathic epilepsy group, the rate of epilepsy among siblings of probands was significantly higher with parental consanguineous marriage (RR=5.3, 95% CI: 1.8-15.3,  $p=0.001$ ). In the cryptogenic epilepsy group, the rate of epilepsy was significantly higher both in siblings (RR=2.4, 95% CI: 1.4-4.9,  $p=0.04$ ) and their children (RR=8.5, 95% CI: 2.5-28.8,  $p<0.001$ ).<sup>11</sup>

### **PREVENTIVE MEASURES**

There appear to be overlap between the practice of arranged marriage and consanguineous marriage with many cultures adopting both practices. For societies where the sexes of marriageable age are allowed to mix freely, practice of arranged marriage is a pre-requisite for consanguineous union. There are also societies that practice arranged marriages without adopting the practice of consanguineous union. In the study on arranged marriage and consanguinity in G.B Pant Hospital, New Delhi, mentioned above, whereas 85% of those interviewed had or were likely to have arranged marriage, only 10 subjects (4%) had consanguineous marriage, out of which 9 were Muslims and one was a Hindu.

There is no doubt social and economic benefits from consanguineous unions, and the undesirable clinical outcomes of close kin marriage affects only a minority of families and individuals.<sup>3</sup> With the smaller size family from improving level of education, socioeconomic conditions and higher age of marriage, a decline in the prevalence of close consanguineous union can be predicted. Nevertheless, the undesirable biological effect of close kin marriage is significant.

The main thrust towards a reduced frequency of consanguineous unions remains in the field of preventive genetics in the form of general education of society. The public education may have to be taken at school level during adolescence to instill the biological risk of close marriages. Parents must be aware of the close associations of their children with the children of their brothers and sisters during their adolescence. Pre-marriage counseling for couples who have a family history of epilepsy and preconception counseling for those with consanguineous marriage will facilitate informed family planning.

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