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THE REPRODUCTIVE CONSEQUENCES OF CONSANGUINITY IN URBAN AND RURAL COMMUNITY

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ABSTRACT.

***Research question**: What is the reproductive consequences of consanguineous marriages in Urban and rural community and what is the effect of consanguinity on pregnancy outcome?*

***Objectives**: To study (i) the reproductive consequences of consanguinity and (ii) its effect on fetal loss, neonatal mortality, obstetric complications and congenital anomalies.*

***Study design**: Cross-sectional Setting: Kadapa District ,A.P,India.*

***Participants**: 1000 married women residing in the urban and rural field practice area were interviewed.*

***Results:** The reproductive consequences of consanguinity was found to be 36%. Majority of the marriages were between first cousins (54.44%). Fetal loss was seen to be significantly higher in the consanguineous group as compared to non-consanguineous group (p0.05). The congenital malformations were - congenital cataract (n=2), bifid tongue (n=3), cyanotic heart disease (n=2), cleft palate (n=2), hydrocephalus (n=1). Only 7.6% of the women were aware about the hazards of a consanguineous marriage.*

***KEYWORDS**: Consanguinity, consequences, Stillbirths, Neonatal mortality, Foetal loss*

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.[1] 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 (F = 0.0625) unions are more frequent comprising 20-30% of all marriages.[2,3] Blood related marriages have higher prevalence in Southern states of India.[4] This social custom is practiced mainly for religious and economic reasons.[5]

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 uncleniece unions (F = 0.125).[6]

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.[5] 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.

Biological disadvantages of children with same blood-line (inbred) unions have been studied and reported globally. Consanguineous unions increase the risk of defective recessive alleles in the offspring.[2] 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.[7] Hence, blood related marriages increase the risk of defective gene being transmitted to the children from the parents. The average level of inbreeding in a homozygous offspring of consanguineous parents is calculated by the coefficient of inbreeding (F). Literature provides data on the increased risk in pregnancy outcome, mortality and morbidity among the offspring's of consanguineous couples.[8] Closer the biological relationship higher is the risk. Consanguinity is also reported to be associated with miscarriages.[8] A significant frequency has been reported between consanguinity and genetic disorders, congenital heart disease, multiple congenital anomalies, neurological malformations, chromosomal disorders and mental retardation.[9] Recent research has also shown genetic contribution to complex diseases.[10]

Children of such a marriage, therefore, are at greater risk of being homozygous for a harmful gene and consequently suffer autosomal recessive genetic disorders.[11] . Pregnancy wastage has also been found to be high for women marrying close relatives.[12]Common adult disease like cancer, mental disorders, heart diseases, gastrointestinal disorders, hypertension, hearing deficit and diabetes mellitus were more frequent among consanguineous marriages. To the best of our knowledge data on prevalence and pattern of consanguineous marriages among different communities in Kadapa district are not available. In this context this study was designed to provide the extent and nature of consanguineous marriages in the Kadapa district population.

MATERIAL AND METHODS

The present study was conducted in Kadapa district,A.P. All the married women residing in the Kadapa district. Villages were included in the study, the number of whom was 1000. A house to house visit was done, and the women were interviewed using a pre-designed preform. Information regarding education, occupation, consanguinity and pregnancy outcome was collected. With regard to pregnancy outcome, a detailed history was obtained from the married woman about her past obstetrical record, which included history of abortions, obstetrical complications and still birth. History with regard to neonatal mortality and presence of congenital malformations in any of the children was also obtain

Results: Majority (53%) of women belonged to the age group between 15 to 30 years. Most of them (46.4%) were illiterate and the majority (64.3%) of them were housewives.

Table1:Religion and consanguinity.

Non-Consanguinity (n=640)(n=360)	consanguinity	
Hindus	594 (64.2%)	330(35.7%)
Muslims	46(60.5%)	30(39.4%)
Total	640(64%)	360(36%)

Of the 1000 women, consanguinity was found in 35% of the marriages. Muslims had a higher frequency (38.5%) than Hindus (33.6%). However, this difference in the frequency was not statistically significant.

Table II: Type of Consanguinity.

	First cousin	Uncle-Niece	Others	Total
Hindus (n=330)	168(50.9%)	120(36.3%)	42(12.7%)	330
Muslims (n=30)	28(93.3%)	2(6.7%)	--	30
Total	196(54.44%)	122(33.8%)	42(11.6%)	360

Majority of the consanguineous marriage were between first cousins (54.44%). Uncle-niece marriages were present in 33.8% while 11.6% of the marriages were among those with more distant relationship.

Table III: Consanguinity and Pregnancy outcome.

	Consanguineous (n=360)	Non-Consanguineous (n=640)	P value
Foetal loss	68(18.8%)	32(5%)	Z=6.5,p<0.001
Still birth	20(5.5%)	30(5.2%)	Z=0.5,p>0.05
Neonatal deaths	22(6.1%)	20(3.1%)	Z=1.76,p>0.05

Fetal losses which occurred at or before 28 weeks of gestation were in 18.8% and 5% respectively in consanguineous and non-consanguineous groups. The value was found to be statistically significant (p0.05). The congenital malformations were - congenital cataract (n=2), bifid tongue (n=l), cyanotic heart disease (n=3), cleft palate (n=l), hydrocephalus (n=2). Only 7.6% of the women were aware about the hazards of a consanguineous marriage.

DISCUSSION

The frequency of consanguinity in the present study was 36% which is less than that observed in other studies in South India[13-15]. This could be attributed to the increasing modernization due to which the chances of such marriages are on the decline. Muslims showed a higher frequency of consanguinity as compared to Hindus. This finding is in contrast to that found in other studies, wherein, consanguineous marriages were more among the Hindus[13,16,18]. The most frequent type of consanguineous marriage in our study was between first cousins (54.44%). This is comparable to the findings observed in other studies[14,16,18]. All the cousin marriages were between cross cousins. No parallel cousin marriages were observed. Fetal losses before 28th weeks were higher in consanguineous group as compared to non consanguineous group, and this difference was statistically significant. Most studies have demonstrated higher fetal losses among pregnancies in women who were married consanguineously[13,19].

Our study, however, did not show a significant difference in the number of still births, neonatal deaths and congenital malformations between the consanguineous and non-consanguineous groups. Jain et al[17]demonstrated that consanguinity had no significant effect on fetal losses but that the frequency of consanguinity was higher with congenital anomalies. Kulkarni et al[20] found that congenital malformations and still birth rates were significantly higher in offspring born to mothers in consanguineous marriages.

Present study did not observe any effect of consanguinity on obstetric complications such as PIH. This finding is similar to that observed by George K. et al in their study on the etiology of PIH[21]. The sample size in the present study was not sufficiently large to study the effect of consanguinity on the stillbirth rate, neonatal mortality and incidence of congenital malformations and genetic disorders.

The awareness with regard to the hazards of consanguineous marriages was very low (7.6%). Hence, this study suggests that steps should be taken to inform people about the problems of marrying close relatives through appropriate IEC programs. It would also be advisable to avoid consanguineous marriages in families where already a child with an autosomal recessive disorder has been born.

CONCLUSIONS

Prevalence of consanguineous marriages in this study was found to be 54.4% of which first-cousin marriages were the commonest. Parental history of consanguinity was found to significantly influence consanguineous marriages among children suggesting role of traditional values. This practice was seen less commonly among well-educated participants. The overall awareness regarding problems associated with consanguinity was very low among most participants. Hence there is a need to create public awareness regarding the ill effects of this social problem. The commonest source of information of ill effects of consanguinity was friends. This supports the effectiveness of interpersonal communication for educating people. The adverse consequences of consanguineous marriages observed in this study were early age at marriage among women and congenital anomalies and low birth weight among their children.[22] Premarital counseling for couples with a family history of anomalies to avoid consanguinity and preconception genetic counseling for those with consanguineous marriage to avoid genetic disorders will facilitate informed family planning.[23] Enquiring of history of consanguinity should also be made a routine practice for all antenatal mothers presenting for obstetric examinations

Strengths of This Study

This was a community-based study done in both urban and rural areas. It analyzed the role of socio demographic variables comprehensively in association with history of consanguineous marriage.

Limitations

In few of the house surveyed, medical records were not available and outcomes in pregnancy and child birth was recorded as told by the parents and hence could not be verified.

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