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CONSANGUINEOUS MARRIAGES AND REPRODUCTIVE BEHAVIOUR: A STUDY FROM VIDARBHA REGION OF MAHARASHTRA

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ABSTRACT

Introduction: India has been subdivided in to two major regions with respect to a preference for or avoidance of consanguineous marriage. The deleterious health effects associated with consanguinity are caused by the expression of rare, recessive genes inherited from common ancestors.

Objectives: To find out the prevalence and types of consanguinity and reproductive behaviour in rural area of Nagpur district.

Methodology: study design: cross sectional study. Setting: Raipura village, a field practise area of Indira Gandhi Government Medical College, Nagpur. Study population: married couples.

Result: The prevalence of consanguineous marriage in study couple was 16.43%. Most prevalent type of consanguineous marriage was seen in mother's brother's daughter type (73.04%). Significant association found in study couples and consanguinity in their parents. No significant effect of consanguinity was observed on foetal loss, neonatal mortality but significant association was found with congenital malformations.

Conclusion: Consanguineous marriages are still favourable in this region.

Key words: consanguineous marriage, parental consanguinity, reproductive outcome.

INTRODUCTION

The practice of inbreeding is likely to have dominated much of human history due to the geographical, ethnic, social, and hence genetic isolation of populations. For example, the first recorded evidence of inbreeding was found in the brother-sister unions of ancient Egypt in royal dynasties.¹

As a working definition, "unions contracted between persons related as second Cousins or closer were categorized as consanguineous."² The

arbitrary limit has been chosen because the genetic influence in marriages between couples related to a lesser degree would usually be expected to differ slightly from that observed in general population.³

Attitude towards consanguinity within Islam are somewhat ambiguous. There is no specific guidance in the Koran that could be interpreted as encouraging consanguinity.⁴

A similar degree of non-uniformity exists in Hinduism; The Aryan Hindus of northern India

prohibit marriages between biological kin for approximately seven generation on the male side and five generations on female side. By comparison, Dravidian Hindus of South India Strongly favours marriages between first cousins.³

According to national family health survey 1992-93, the prevalence in Maharashtra was 21%. It was highest in Andhra Pradesh 30.8% and least in Mizoram 0.5%. The prevalence also differs by major religion all over India as in Hindus it was 10.6%, Muslims 23.3%, Buddhists 17.1%, Sikh 1.5%, Jain 4.3% and others 8.7%.⁵

It is a universally accepted and proved fact that every person carries 5 to 6 mutated genes, the possibility of commonness of genes increases among blood relatives due to commonness of the fore parents.⁶

In terms of gross fertility, large scale surveys conducted in many countries have indicated greater numbers of infant born to consanguineous couples, with no effect either on multiple birth rates or on the sex ratio at birth of progeny. A variety of social factors are strongly implicated in the greater fertility of consanguineous marriages.⁷

This study is an attempt to find out the prevalence and types of consanguinity and reproductive behaviour in rural area of Nagpur district, Vidarbha region of Maharashtra

MATERIALS AND METHODS:

The present study was carried out in Raipura village, which belongs to rural health and training centre, Hingana, a field practise area under the administrative control of department of preventive and social medicine, Indira Gandhi Government Medical College, Nagpur. According to primary health centre's Raipura health survey register 2007, the population of Raipura village was 8033 and numbers of married couples were 1362.

The present study was cross sectional study, all married couples residing in Raipura village included as study subjects except inter-caste married couples, who were excluded from study population.

METHODOLOGY

According to primary health centre's survey register, there were 1006 houses in the Raipura vil-

lage. After numbering all houses serially, houses were selected by simple random sampling. Selected houses were visited, if at least one married couple was available in the house fulfilling the inclusion and exclusion criteria, couple was interviewed. A house not having married couples was excluded from study and then next house was visited till the house having married couple was available. By this method, initially 200 married couples were selected for pilot study.

For each couple, good rapport was established with informed consent the purpose of the study was explained to them and then with help of preformed pretested proforma information about socio-demographic profile of study couple was obtained. Their family pedigree was drawn as per information given by them. A history about all pregnancy outcomes, living children was obtained

Study couples were visited early morning between 7am to 9am as most of the peoples were available in morning hours, if study couples were not available at the time of first visit, then 2nd and 3rd visits were paid on subsequent days even though study couples were not available then that house was excluded from study and next house with married couple was included in the study.

Prevalence of consanguinity was found to be 20% in pilot study. Calculation of sample size was done on the basis of this prevalence. The estimated sample size was 683. Hence it was decided to take the sample of 700 couples for this study.

After pilot study remaining 500 married couples included in the study to complete the required sample size. Appropriate statistical test were used wherever it is applicable.

RESULTS

Socio-demographic profile: In this study mean age of husbands was found to be 40.86 (± 12.60) yrs and mean age of wives was 35.09 (± 12.17) yrs. It was found that majority of study subjects' 279 (39.86%) husbands and 305 (43.57%) wives were educated up to secondary level while 118 (16.86%) husbands and 170 (24.29%) wives were illiterate. Majority of husbands 380 (45.29%) were unskilled workers, while 560 (80%) wives were housewives.

Majority of couples 380 (54.29%) belongs to class IV socioeconomic level of BG Prasad's socioeco-

conomic classification. Only 53 (7.57%) study couples were of socioeconomic class I & II, while 142 (20.29%) & 125 (17.85%) couples belongs to Class III and V respectively.

Mean age at marriage for husbands was 23.90 (± 4.22) yrs and for wives 18.12 (± 3.46) yrs.

Prevalence: In this study the prevalence of consanguineous marriage in study couple was 16.43% (115) while 83.57% (585) of study couples had non-consanguineous marriages.

Most prevalent type of consanguineous marriage was seen in mother's brother's daughter type (MBD), which is 84 (73.04%), followed by 11 (9.57%) in each of father's sister's daughter (FSD) and mother's sister's daughter type (MSD). Only 1(0.87%) couple had aunt-nephew type of consanguineous marriage.

Consanguinity and other variables: It was found that majority of husbands 73 (63.48%) in consanguineous and 413 (70.60%) in non-

consanguineous couples got married after 21 yrs of age but majority of wives 66 (57.39%) in consanguineous couples and 336 (57.44%) in non-consanguineous couples got married before age of 18yrs; However no association was found to be significant ($p > 0.5$) between age at marriage of husbands or wives in consanguineous and non-consanguineous couples.

In this study 26 (22.61%) of consanguineous couples and 141 (24.10%) non-consanguineous couples had married life of less than 5yrs. While 13(11.31%) consanguineous couples and 97(16.58%) non-consanguineous couples had married life of 30yrs or more. No specific trend was observed in this study when duration of marriage and consanguinity compared.

Maximum prevalence of consanguineous marriage was seen in Muslim study couples, which was 23.76%, followed by 15.88% in Hindu study couples and least prevalence 7.84% was seen in Buddhist study couples (table 1).

Table 1: Distribution of study couples according to religion and consanguinity

Religion	Consanguineous couples	Non-consanguineous couples	Total
Hindu	87 (15.88)	461 (84.12)	548 (100)
Muslim	24 (23.76)	77 (76.24)	101 (100)
Buddhist	4 (7.84)	47 (92.16)	51 (100)
Total	115 (16.43)	585 (83.57)	700 (100)

Figures in parenthesis indicate percentage

Table 2: Distribution of study couples according to religion and type of consanguinity.

Religion	Type of consanguinity						Total
	MBD*	FSD*	MSD*	2C*	UN*	AN*	
Hindu	64 (73.56)	9 (10.34)	6 (6.90)	4 (4.60)	3 (3.45)	1 (1.15)	87 (100)
Muslim	17 (70.83)	1 (4.16)	5 (20.83)	1 (4.16)	0.0 (0)	0.0 (0)	24 (100)
Buddhist	3 (75.00)	1 (25.00)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4 (100)
Total	84 (73.04)	11 (9.57)	11 (9.57)	5 (4.34)	3 (2.61)	1 (0.87)	115 (100)

*MBD-Mother's brother's daughter; FSD-Father's Sister's daughter; MSD-Mother's sister's daughter; 2C-Second Cousin; UN-Uncle-niece; AN-Aunt-nephew; Figures in parenthesis indicate percentage

In Hindu study couples maximum consanguineous marriages were MBD type 64 (73.56%), followed by FSD type 9 (10.34%) and MSD type 6 (6.90%). While uncle-niece and aunt-nephew marriages were seen exclusively in Hindu Couples only. In Muslim study couples most prevalent type of consanguineous marriage were also MBD type 17(70.83%) followed by MSD 5 (20.83%). In Buddhist study couples MBD type 3 (75%) and FSD type 1 (25%) consanguineous marriages seen (table 2). It was found that in consanguineous couples, 14 (12.17%) husbands had consanguineously married parents while 10

(8.70%) wives had consanguineously married parents. In non-consanguineous couples only 8 (1.37%) husbands and 7 (1.20%) wives had consanguineously married parents (table 3). The association of consanguinity in study couples with that of consanguinity in their parents was found to be statistically significant for husbands as well as wives (for husbands $\chi^2 = 35.53$;d.f.1;p<0.05; for wives $\chi^2 = 22.80$;d.f.=1;p<0.05).

Reproductive Behaviour: In consanguineous group, 108(93.91%) couples reported at least one conception and in non-consanguineous group

523(89.40%) couples reported at least one conception.

Out of 322 outcomes of pregnancies in consanguineous couples 4 (1.24%) were resulted in abortion/stillbirth while remaining outcomes were live births. Out of 1596 pregnancies in non-

consanguineous couples, 45 (2.28%) outcomes were abortions/stillbirths, while 1551 (97.18%) pregnancies resulted in live births. The association of consanguinity and outcome of pregnancy was found to be non-significant ($\chi^2=3.34$;d.f.=1;p>0.05).

Table 3: Distribution of study couples according to consanguinity in parents.

Couples	Consanguinity in parents			
	Present		Absent	
	Husbands	Wives	Husbands	Wives
Consanguineous	14 (12.17)	10 (8.70)	101 (87.83)	105 (91.30)
Non-consanguineous	8 (1.37)	7 (1.20)	577 (98.63)	578 (98.80)
Total	22 (3.14)	17 (2.42)	678 (96.86)	683 (97.58)

Figures in parenthesis indicate percentage

Table 4: Distribution according to status of children born to study couples

Child status	Consanguineous couples	Non-consanguineous couples	Total
Live births	318 (100)	1551 (100)	1869 (100)
Neonatal deaths	8 (2.52)	23 (1.48)	31 (1.66)
Post-neonatal deaths	7 (2.20)	34 (2.19)	41 (2.19)
1-4yrs deaths	5 (1.57)	18 (1.16)	23 (1.23)
5-15yrs deaths	1 (0.31)	10 (0.64)	11 (0.60)
Living children	297 (93.40)	1466 (94.53)	1763 (94.52)

Figures in parenthesis indicate percentage

Consanguineous couples reported 8 (2.52%) neonatal and 7 (2.20%) post neonatal infant deaths; while in non-consanguineous these rates were 23 (1.48%) and 34 (2.19%) for neonatal and Post neonatal infant deaths respectively (table 4). The association of neonatal and infant mortality with consanguinity found to be statistically non significant ($p>0.05$).

It was found that 138 (64.79%) consanguineous couples and 742 (69.35%) non-consanguineous couples maintained a spacing of 1-2yrs. between two child births, while 29 (13.62%) consanguineous couples and 81 (7.57%) non-consanguineous couple kept ≤ 1 year of spacing between two children which was found to be statistically significant ($p<0.05$).

There were 6 (2.02%) children of consanguineous couples who had congenital anomalies while there were 9 (0.61%) children with congenital anomalies in non-consanguineous couples. The association of congenital anomalies in children and consanguinity in their parents was found to be statistically significant ($\chi^2=4.24$;d.f.=1;p<0.05).

DISCUSSION

This study confirmed that the prevalence in consanguineous marriages was 16.43% which is similar to prevalence 15.5% found by Banerjee SK⁸ for western part of India i.e. Maharashtra, Gujrat & Goa. While Rao PSS et al⁹ found very high prevalence 46.9% for rural areas of his study group in south India; it may be due to where high preference of consanguinity in that region.

Our study shows no association between age at marriage and consanguinity, similar findings were noted by Reddy PH¹⁰ the mean age at marriage 23.10(± 3.93) & 17.86(± 3.62) for consanguineous husband and wives while in Bittles AH¹¹ study the mean age at marriage 23.13(± 0.92) & 18.79(± 0.70) for consanguineous husband and wives.

As consanguinity is related to religious practises in respective regions, our study had high prevalence in Muslims 23.76% followed by Hindus 15.88% and Buddhists 7.84% similar findings were observed by Metgud CS¹³ while in Bittles AH¹¹ study there was high prevalence in Hindus 80.4% followed by Muslims 15.9% and Christians

3.8%; in contrast Agarwal SS et al¹² found 0.3% Hindu and 25.2% Muslim were consanguineously married.

The most prevalent type of consanguinity in our study was first cousins type, Reddy PH¹⁰ & Rao PSS et al⁹ found similar types of consanguinity while Bittles AH et al¹¹ shows uncle-niece type consanguinity most common followed by first cousin type consanguineous marriages.

In this study most common first cousin type consanguinity was MBD type in all religions while FBD type consanguinity was absent similarly Rao PSS et al⁹ found high prevalence of MBD type but he found 11.11% FBD type marriages in Muslims.

The association of consanguinity in study couples with that of consanguinity in their parents was found to be statistically significant for husbands as well as wives in this study; similar findings were seen in studies of Hamamy H¹⁴ and Khoury SA et al.¹⁵ This shows that consanguinity is preferred by younger generation whose parents were also consanguineously married.

In this study 1.24% pregnancy outcome in consanguineous couples resulted in abortion/stillbirths compared to 2.82% abortion/stillbirths in non-consanguineous couples but it is statistically non-significant. Studies done by Metgud CS¹³, Reddy BKC et al¹⁶ & Kerkeni et al¹⁷ found similar association but many other studies done by Bittles AH et al¹¹, Banerjee SK⁸, Nath et al¹⁸ found strong association between consanguinity and pregnancy outcomes. The results are differed may be due to under-reporting of abortions by study couples.

Our study shows 2.52% neonatal and 2.20% post neonatal infant deaths in consanguineous couples and in non-consanguineous couple reported 1.48% neonatal & 2.19% post neonatal infant deaths, this difference found to be statistically non significant. Nath et al¹⁸ reported 6.1% and 3.1% neonatal deaths in consanguineous and non-consanguineous couples respectively which was also non significant. Similarly Reddy BKC¹⁶ found 1.47±0.16 infant deaths in consanguineous and 1.10±0.12 infant deaths in non-consanguineous couple, which is also statistically non significant.

The average birth interval for consanguineous couple was 1.95±0.43 yrs while it was 2.12±0.15 yrs for non-consanguineous couples. Association of consanguinity found to be statistically significant, Mumtaz G et al¹⁹ in her study found 10.6%

and 6.2% consanguineous and non-consanguineous couples maintained birth spacing of less than 13 months, which was found to be significant.

Congenital anomalies found to be significantly more 2.02% in children of consanguineous couples than 0.61% in non-consanguineous couple. Similar results were shown by Agarwal SS et al¹², Hamamy HA et al²⁰ in their studies.

CONCLUSION

This study re-enforces the prevalence of consanguinity found by NFHS 1992-93, this shows that consanguineous marriages are still favourable in this region. While our study shows significant association between congenital anomalies and consanguinity, we can't affirm it because of small sample size. People likely to married consanguineously whose parents were also consanguineously married so there is need of awareness and counselling about consanguineous marriages in the community.

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