Original Article

CONSANGUINITY AND PREGNANCY OUTCOME AMONG RURAL PREGNANT WOMEN OF BELGAUM DISTRICT

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ABSTRACT

Background: Although unions between close biological relatives are preferred in many parts of South India, there still is a large gap of knowledge of this feature of human kinship structure. So, the present study was conducted to know the prevalence and types of consanguineous marriages and its effect on abortion, stillbirth, mortality and congenital malformation.

Methods: The present longitudinal study was carried out in Kinaye Primary Health Centre of district Belgaum. All the pregnant women residing in the study area were included in the study, the number of whom was 1138.

Results: The prevalence of consanguinity in our study was found to be 20.3%. Majority (53.2%) of the marriages were between first cousins. The prevalence of consanguinity was significantly higher in illiterate couples ($p < 0.001$ and p 0.004) and in women belonging to Muslim religion (p 0.02). No significant effect of consanguinity was noted on the rate of abortion, stillbirth, mortality and congenital malformation.

Conclusion: Consanguinity was higher among illiterate rural couples. Hence efforts should be made to enhance the literacy status through Information, Education and Communication activities. Consanguinity is one of the important contributory factors for adverse pregnancy outcomes. So, it would be advisable to avoid consanguineous unions in families where already a congenital malformed child has been born.

Keywords: Consanguinity, Pregnancy outcome, Rural, Pregnant women, Abortions, Stillbirths

INTRODUCTION

Marriage between two individuals who have at least one traceable common ancestor is said to be "consanguineous" and offspring of such mating "inbred".[1] The tradition of consanguineous is old and widely practiced. It is estimated that, in the world about 20% of human population live in societies with a preference for consanguineous union, and that at least 8.5% of children have consanguineous parents.[2] In general consanguinity results from religious norms and perceptions, cultural, social, economic and historical factors are also important in maintaining this practice.

Globally, the most common form of consanguineous union contracted is between first cousins, in which the spouses' share 1/8 of their genes inherited from a common ancestor.[3] There are variations in the specific types of first-cousin marriage, while marriage to mother's brother's daughter is the strongly preferred form of consanguineous union among South Indian Hindus, all four types of first-cousin union, i.e. to father's brother's daughter, to

father's sister's daughter, to mother's brother's daughter, and to mother's sister's daughter, are arranged in South Asian Muslim communities.[4] It is a well known fact that the consanguineous marriages have more chances of bringing rare recessive alleles together leading to autosomal recessive genetic disorders.[2,3] The various ill effects on pregnancy outcome are repeated abortions, stillbirths, increased mortality, congenital malformations and mental retardations.[2,5]

It is important to bear in mind that even while modernization, urbanization and smaller family size may reduce the incidence of consanguinity, it still may not totally eradicate its practice. Data on trends in the prevalence of consanguineous marriage in predominantly Hindu South India are somewhat contradictory, with some studies suggesting a decline and others that there has been no recent change.[4] The present investigation was undertaken to determine the prevalence and type of consanguinity among pregnant women in rural Karnataka, and its effects on pregnancy outcome.

METHODOLOGY

The present longitudinal study was carried out in Kinaye Primary Health Centre (PHC) of district Belgaum. All the pregnant women residing in the PHC were included in the study, the number of whom was 1138. The Ethical clearance was obtained from KLE University Ethical Committee. Written informed consent was obtained from all the study participants at the time of enrolment. Every enrolled woman had two contact examinations. The data was collected by interview using a pre-designed and pre-tested proforma. During the first visit maternal socio-demographic information was collected along with consanguinity and previous pregnancy outcome. With regards to pregnancy outcome, a detailed history was obtained from the pregnant woman about her past obstetrical record, which included history of abortions and stillbirths. History with regard to neonatal mortality, infant mortality and congenital malformations in any of the children was also obtained. Second visit was carried out at the end of the pregnancy. The data was collected regarding pregnancy outcome, birth weight and other relevant information. **STATISTICS:** Data analysis was done using SPSS 12 trial version. Numerical outcomes were summarized by Mean and Standard Deviation and compared with unpaired't' test. To test the association between categorical data Chi-square test was used. $P < 0.05$ was considered statistically significant.

RESULTS

Out of 1138 pregnant women studied, 86.2% were between 20 – 29 years and 6.9% each were ≥ 30 years and teenage pregnancies. Majority (85.8%) were Hindus and most of them (67.6%) belonged to classes III and IV according to Modified B G Prasad's socio-economic status classification.[6,7] Most of them (86.5%) were literates and the majority (66.9%) were housewives. Maximum of them 771 (67.8%) belonged to joint family and 1012 (88.9%) husband's of the pregnant women were literates. The mean ± SD of age at marriage and first pregnancy was 18.9 ± 2.2 years and 20.6 ± 2.4 years respectively. In regards to gravidity, 431 (37.9%) were primigravida, 394 (34.6%) 2nd gravida, 224 (19.7%) 3rd gravida, 59 (5.1%) 4th gravida and grand multiparity was noted in 2.7% women. In our study, 469 (41.2%) pregnant women were primipara and remaining were multipara.

Table 1: Comparison between consanguineous and non-consanguineous unions (N = 1138)

Variable	Consanguineous (n = 231)	Non-consanguineous (n = 907)	P value
Age at marriage (in years)	18.4 ± 2.4	19.0 ± 2.2	**< 0.001**
Age at first pregnancy (in years)	20.4 ± 2.3	20.7 ± 2.5	0.08
Gravidity (number)	2.09 ± 1.04	1.98 ± 1.00	0.61
Parity (number)	1.95 ± 0.96	1.89 ± 0.94	0.72
Number of living children	1.90 ± 0.94	1.85 ± 0.92	0.96
Birth weight of newborn (in kg)	2.58 ± 0.41	2.63 ± 0.36	0.08

Values are expressed as Mean ± SD

It was observed that 396 (34.8%) of pregnant women had one living child, 199 (17.5%) two children, 58 (5.1%) had ≥ 3 living children and 485 (42.6%) none. The prior adverse obstetric

outcomes among pregnant women noted were: previous abortion in 8.4%, stillbirth in 1.8%, congenital malformation in 1.6% and death of a sibling in 2.0%. As per obstetric outcome for the present gestation, 97.8% of pregnant women had live birth, 18 (1.6%) stillbirth and 7 (0.6%) ended in abortion. The mean birth weight of newborns was 2.6 ± 0.4 kg with a range of 1.2 to 3.8 kg. In the present study, 596 (52.7%) and 535 (47.3%) were male and female newborns respectively.

The prevalence rate of consanguinity was 20.3%. Among 231 consanguineous marriages, more than 50% were between first-cousins, 58 (25.1%) between maternal uncle and niece and 50 (21.7%) between distant cousins. The maternal uncle-niece (n = 58), mother's brother's daughter and father's sister's daughter type of first-cousins marriages (n = 84) were strongly preferred form of consanguineous unions among Hindus in our study area. Father's brother's daughter, mother's sister's daughter (n = 20), father's sister's daughter and mother's brother's daughter (n = 19) all type of first-cousins consanguineous marriages were practiced by Muslim community. The consanguineous unions as a whole were more fertile, got married at a younger age and had newborns of lower birth weight than non-consanguineous unions **(Table 1).**

The prevalence of consanguinity was significantly higher in illiterate couples and in women belonging to Muslim religion **(Table 2).** Whereas, it was not significantly associated with maternal age (X^2 = 0.37, p = 0.95), type of family (X^2 = 0.30, p = 0.58) and socio-economic status (X^2 = 2.23, p = 0.69) of the pregnant women.

Table 2: Association between socio-demographic variables of pregnant women and consanguinity (N = 1138)

Variable	Consanguin-eous (n = 231)	Non-consangui-neous (n = 907)	P value
Religion			
Hindu	186 (19.1)	790 (80.9)	**0.02**
Muslim	39 (29.5)	93 (70.5)	
Others	6 (20.0)	24 (80.0)	
Literacy status of pregnant women			
Illiterate	43 (27.9)	111 (72.1)	**< 0.001**
Primary	86 (22.7)	293 (77.3)	
High school	85 (20.1)	337 (79.9)	
Post SSLC	17 (10.7)	142 (89.3)	
Graduate	0 (0.0)	24 (100.0)	
Husbands' literacy status			
Illiterate	31 (24.6)	95 (75.4)	**0.004**
Primary	55 (22.5)	189 (77.5)	
High school	107 (22.9)	361 (77.1)	
Post SSLC	31 (13.5)	199 (86.5)	
Graduate	7 (10.0)	63 (90.0)	

Figures in parenthesis indicate percentage

Foetal losses which occurred at or before 28 weeks of gestation were in 10.8% and 7.8% respectively in consanguineous and non-consanguineous groups. The value was found to be not statistically significant (p = 0.14). Death of a sibling was higher in non-consanguineous than in consanguineous marriages. There was no significant difference in the stillbirth (p = 0.42) and congenital malformation (p = 0.28) between the consanguineous and non-consanguineous groups **(Table 3).**

Table 3: Consanguinity and pregnancy outcome (N = 1138)

Pregnancy outcome	Consanguineous (n = 231)(%)	Non-consanguineous (n = 907) (%)	P value
Previous pregnancy outcome			
Abortion	25 (10.8)	71 (7.8)	0.14
Stillbirth	6 (2.6)	14 (1.5)	0.42
Death of a sibling	4 (1.7)	19 (2.1)	0.91
Congenital malformation	6 (2.6)	12 (1.3)	0.28
Present pregnancy outcome			
Bad outcome (stillbirth and abortion)	6 (2.6)	19 (2.1)	0.64

DISCUSSION

The prevalence of consanguinity in our study was 20.3% which is less than that observed in other studies in Andhra Pradesh,[4,8,9] Puducherry[10] and Tamil Nadu.[2,4] When compared with studies carried out in Karnataka state[4,11,12] and Belgaum rural areas[13,14] also the frequency of consanguinity was less in the present study. The trend of consanguineous marriage in South Indian states over the past two to three decades has been in the range of 20 to 40%. From review of literature we can infer that there is an overall decline in the trend of consanguineous unions. This could be attributed to the increasing modernization, urbanization and the gradual shift to smaller and nuclear families. Muslims showed a higher prevalence

of consanguinity as compared to Hindus. This finding is similar to other studies[4,13,14] except one study were the prevalence was more in Hindus.[10] The most common type of consanguineous union in the present study was between first cousins (53.2%). This is comparable to the findings observed in other studies [4,8,10,11,13,14] except one study were maternal uncle-niece consanguineous marriage was more frequent.[2] The reduction in the incidence of uncle-niece marriage can be attributed to the unacceptable age differentials between the potential partners.

The mean number of gravidity, parity and living children was 2.09, 1.95 and 1.90 respectively among consanguineous couples compared with 1.98, 1.89 and 1.85 respectively among non-consanguineous couples. Although the number of gravidity, parity and living children was higher among consanguineous couples compared with non-consanguineous couples, the difference was not statistically significant. This finding was similar to other studies,[8,12] but the mean values of earlier studies were slightly higher when compared with our study. Most studies have demonstrated higher rate of abortions, stillbirths, mortality, morbidity, infertility, sterility and congenital malformations among pregnancies in women who were married consanguineously.[8,10,12-15] Our study, however, did not show a significant difference in the number of good and bad pregnancy outcomes between consanguineous and non-consanguineous groups. The adverse pregnancy outcomes are also dependent on other non-genetic factors like maternal, foetal and environmental factors.

CONCLUSION

Communicable diseases and nutritional disorders are still major public health problems in India. The non-communicable diseases are on the raise. The genetic disorders already present as a significant although largely underestimated problem. Now it is the appropriate time to correctly measure the burden of genetic disorders and invest in the training of specialist medical, nursing and counselling staffs.

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REFERENCES

1. Bhaskin MK, Nag S. Consanguinity and its effects on fertility and child survival among Muslims of Ladakh in Jammu and Kashmir. Anthropologist 2002; 1: 131 – 40.
2. AnitaDevi CP, Sudarsanam D. Role of Consanguinity in Mental Retardation. Asian J. Exp. Biol. Sci. 2011; 2: 162 – 4.
3. V McKusick. Human Genetics, 2nd ed. New Delhi: Prentice Hall of India; 1972. p 145 – 9.
4. Bittles AH. Endogamy, consanguinity and community genetics. Journal of Genetics 2002; 81: 91 – 8.
5. RoyChoudhary AK. Incidence of in-breeding in different States of India. Demography India 1976; 5: 108 – 15.
6. AH Suryakantha. Community Medicine with Recent Advances, 2nd ed. New Delhi: Jaypee Brothers Medical Publishers; 2010. p 679 – 80.
7. Consumer Price Index. Available at http;//www.rbi.org.in/scripts/BS_EntireSearch.aspx?search String = CPU & strSection = Bulletin. Accessed February 8th, 2010.
8. Reddy PG. Effects of consanguineous marriages on fertility among three endogamous groups of Andhra Pradesh. Social Biology 1987; 34: 68 – 77.
9. Chandrasekar A, Jayraj JS, Rao PS. Consanguinity and its trend in a Mendelian population of Andhra Pradesh, India. Social Biology 1993; 40: 244 – 7.
10. Verma IC, Prema A, Puri RK. Health effects of consanguinity in Pondicherry. Indian Pediatrics 1992; 29: 685 – 92.
11. Devi AR, Rao NA, Bittles AH. Consanguinity, fecundity and post-natal mortality in Karnataka, South India. Annals of Human Biology 1981; 8: 469 – 72.
12. Hann KL. Inbreeding and fertility in a South Indian population. Annals of Human Biology 1985; 12: 267 – 74.
13. Nath A, Patil C, Naik VA. Prevalence of consanguineous marriages in a rural community and its effect on pregnancy outcome. Indian Journal of Community Medicine 2004; 29: 41 – 3.
14. Godhi SA, Metgud CS, Mallapur MD, et al. Prevalence of consanguineous marriage and its effect on pregnancy outcome in a rural area. Journal of Scientific Society 2009; 36: 93 – 5.
15. Chantia A. Effects of inbreeding on health among Dhankut – An endogamous group of Bahraich, Uttar Pradesh. Anthropologist 2008; 10: 219 – 23.