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Research Article

Epidemiological study of consanguineous marriage and its effects

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ABSTRACT

Background: Consanguinity increases the risk of congenital anomalies, autosomal recessive disorders, perinatal and antenatal morbidities. The objective of this study was to know the effects of consanguineous marriages and educate the people regarding the effects of the same.
Methods: A community based Cross Sectional study was conducted amongst 130 married couples in the field practice area of KBNIMS, Kalaburgi, Karnataka, India by using simple random sampling technique. Data was collected in pre designed pre tested questionnaire.
Results: Out of 130 married couples, 58 were consanguineously marriage (44.6%). Among these families, consanguineous marriages were more in Muslim families (56.05%) as compared to Hindu families (25%). Prevalence of abortions and preterm deliveries was noted to be 60% and 64.28% respectively in consanguineous marriages. It had been witnessed that 66.6% of hearing defects in the community were in consanguineous families and a 100% of all vision defects were seen in consanguineous conceptions.
Conclusions: As per the study it was found that the prevalence of consanguinity was more in the Muslim population than in Hindu population. Maternal and child morbidity were more prevalent in consanguineous marriages as compared to non-consanguineous marriages. There is a lack of awareness and knowledge about the ill effects of consanguinity. Health education and genetic screening were suggested to curb consanguineous marriages in order to prevent adverse outcomes for better health.

Keywords: Consanguineous marriages, Muslim, Hindu, Maternal and child morbidity

INTRODUCTION

Consanguinity is defined as marriages between blood relatives; however geneticists usually use this term to refer to union between second cousins and closer relatives.[1]

There is historically, a high prevalence of consanguinity in many communities throughout the world, especially in the countries of Middle East, Africa and south Asia accounting for 20 to 50% of all marriages. It is estimated that 1 billion current global populations prefer consanguinity. First cousin unions are rather common consisting of 20-30% of all consanguineous marriages.[2,3] It is important to note that the reasons for such high prevalence of consanguinity, especially amongst blood relatives in southern states of India are mainly religious and economic.[4,5] Amongst the Hindus, it was found that about 30% of all the marriages were consanguineous, with 20+% culminating in uncle-niece unions.[6] Other reasons towards consanguinity are believed to be the fear of marrying into an unknown family, requirement of less transaction of gifts and dowry and common cultural practices that favour both the families.[5] Parents who wed their children into such arrangements believe that the physical attributes will be looked into less and the in-laws

will be more caring and supportive.[5] In a broader perspective consanguinity is thought to be associated with socio-economic levels, education and rural versus urban setup.[5]

How this affects children conceived through such marriages has been extensively studied and a conclusion has been reached where it has come to be evident off-springs of such marriages have a significant biological disadvantage. This is because consanguinity is found to increase the risk of defective recessive alleles in the children conceived.[7] It is known that brothers and sisters share 50% of their genetic make-up, uncle and nieces share about 25% and first cousins share around 12.5% of inherited genetic material.[7] Hence the risk of transferring a defective gene becomes a possible probability in blood related marriages. Consanguinity is found to increases the risk of maternal morbidity such as spontaneous abortions and also increase the risk of new-born morbidity.[8] A significant frequency has been associated with consanguinity and genetic disorders, congenital malformations and disorders, neurological malformations, chromosomal aberrations and mental retardation.[9] Not only this, common adult diseases like hypertension, diabetes mellitus, cancer, heart diseases and even gastro intestinal disorders were found to be more among off-springs of consanguineous marriages.[10]

It is worthy to note that not many, if any, studies have been conducted on consanguinity in Muslim predominant area. Globally, Muslims have been extensively known to conduct inbred marriages. In Pakistan, the overall frequency was found to be a staggering 76%.[11] The overall rate of consanguinity in Saudi was found to 57.7%.[12] The frequency of consanguinity in Egypt was 28.96%.[13] These and many more Muslim countries in Africa have shown significantly high frequencies of inbreeding. India being a diverse and accommodating country, many geographical pockets in India are predominantly Muslim. Absence of any such study in a Muslim predominant area was the inspiration to take up such a study.

METHODS

A community based cross sectional study was done among married women in the field practice area of Khaja Banda Nawaz Institute of Medical Sciences (KBNIMS), Kalaburgi, Karnataka, India from 1st April 2015 to 30th June 2015. This area was selected considering the sensitivity of the issues and cooperation of the subjects. Study in Rawalpindi showed that prevalence of consanguineous marriages among Muslims was 76%; based on that and using the formula $N= 4pq/L^2$ where L was taken as 10% the nearest sample size was 126.[11] To make it equal to the nearest whole number a total of 130 women of reproductive age group was considered in the study. To meet the desired sample size and to cover whole population every 5th house of the field practice area was included in the study. A house to house visit of the area was done beginning from the randomly selected household and moving along the right hand side till the required sample size was achieved. If a house-hold had more the one married woman youngest women was taken into consideration. Whenever houses with no married women were detected; that house was skipped and went to the next house. In the absence of respondents during the first visit, 2 subsequent visits were made to contact them. Not willing to participate (2 women) in spite of 2-3 persuasion were dropped. Thus a total of 130 women belonging to different house-holds were included in the study.

A pre-tested, pre-designed and semi-structured Proforma was used for the data collection. Visits to urban health training centre (UHTC) were made on the pre-decided dates and the married women were assessed. Data was collected regarding religion, type of family, type of delivery and pregnancy outcomes. The women were explained the objectives of our study and were assured that their identities won't be disclosed. Consent was obtained from all the participants of the study. Thus collected data was coded and analyzed by Microsoft Excel 2007 and was further tabulated and presented.

RESULTS

A total of 130 families participated in the study out of which 82 families were Muslim and 48 were Hindu. A total of 58 families were found to be consanguineously married among the 130 families included in the study giving a prevalence of 44.6%. Among these families, consanguineous marriages were more in Muslim families (56.09%) as compared to Hindu families (25%) (Table 1).

Chi square test done between the religions was highly positive (x^2=11.8492; P<0.05). Consanguinity was seen more in joint families (55.17%) than in nuclear families (41.58%) (Table 1).

The chi square test showed no significant association with types of family. 9 out of 14 preterm deliveries reported in the community were from consanguineous unions (64.28%). Also 18 of the total 30 abortions reported during the study were from women married into consanguinity (60%) (Table 2).

Chi square test did not show any significance towards these parameters. It had been witnessed that 66.6% of hearing defects in the study group were in consanguineous families and a 100% of all vision defects were seen in consanguineous conceptions (Table 3).

Out of the overall 130 families that participated in the study, 77 were in favour of the idea that that consanguineous marriages were a feasible, convenient and a good option (59.23%) and it was also found that there is a lack of awareness and knowledge about the ill effects and consequences of consanguineous marriages in the Khaja Bazaar area, only 62 families of the entire

study population had the basic idea of consanguinity and its effects (47.69%). A majority of 68 families (52.30%) had no knowledge about consanguinity and its effects (Table 4); highlighting the need to educate the population on the matter.

Table 1: Relation between type of marriage and its variables.

Variables	Consanguineously married			Chi-square value	P value
	Yes (n=58)	No (n=72)	Total 130		
Religion					
Hindu	12	36	48	11.8492	0.000577
Muslim	46	36	82		
Type of family					
Nuclear	42	59	101	1.6836	0.194452
Joint	16	13	29		

Table 2: Relation between type of marriage and impact on maternal health.

Variables	Consanguineously married			Chi-square value	P-value
	Yes (n=58)	No (n=72)	Total 130		
Pregnancy outcome					
Abortion	18	12	30	1.6865	0.7931
Death	13	13	26		
Live	34	40	74		
Type of delivery					
Pre term	9	5	14	0.1841	0.6679
Normal	**51**	**65**	116		

Table 3: Disorders in the new-borns in the community among consanguineous versus non-consanguineous.

Variables	Consanguineous married			Chi-square value	P-value
	Yes (n=58)	No (n=72)	Total 130		
Disorders					
Hearing defect	**2**	1	3	1.2	0.2733
Vision defect	3	0	3		

Table 4: The attitude towards consanguinity and the knowledge about the consequences of consanguinity in the community.

Variables	Positive		Negative	
	No.	%	No.	%
Knowledge	62	47.69	68	52.30
Attitude	77	59.23	53	40.76

DISCUSSION

In this study a high prevalence of consanguinity was found (44.6%). This is at par with earlier studies that show the prevalence of consanguinity amongst populations in south India to be fairly high.[4] Some of the previously done studies show the prevalence of consanguinity in south India to be ranging from 20%-60% which matches to the finding of this study14-20. A study done previously in the Mangalore to reveal the pattern and prevalence of consanguinity had concluded that consanguinity is more in Muslims than in Hindus and Christians.[21] Another study conducted in Belgaum had also resulted in the same conclusion.[22] Both these studies support and substantiate the finding of this study which also shows consanguinity to be more amongst Muslims. This trend is prevalent all over the world, especially in middle eastern and African Muslim countries.[12,13] However a study conducted in Pondicherry reported more consanguinity amongst Hindus than among Muslims8. A study conducted in Lebanon showed that infants of consanguineous parents had a 1.6 fold increased statistical chance of being born before term.[23] This finding is consistent with the finding of this study. This study shows that abortion was more prevalent in women married into consanguinity (60%). This finding is in contrast to a study conducted in Jordan over consanguinity and its effects on reproductive health but is in accord to a study conducted in Karachi, Pakistan where not only was abortion seen to be associated with

consanguinity but it was also shown that greater degree of consanguinity was associated with more chances of spontaneous abortions.[24,25] This study shows a high prevalence of congenital defects in consanguinity. This finding of the study can be found consistent with a study conducted in Norway that found that birth defects in children tended to increase in consanguinity.[26] Consanguinity has been attributed to low socio-economic status and knowledge about the consequences of consanguinity, can be held directly proportional to Education status of an individual.[5] A study conducted in Iran showed consanguinity to decrease as education status and socio-economic status increased.[27] The findings in this study of the poor knowledge and positive attitude towards consanguinity can be attributed to the poor socio-economic status and low educational status of the study area.

CONCLUSION

As per the study it was found that the prevalence of consanguinity was more in the Muslim population than in Hindu population. Maternal and child morbidity were more prevalent in consanguineous marriages as compared to non-consanguineous marriages. There is a lack of awareness and knowledge about the ill effects of consanguinity. Health education and genetic screening were suggested to curb consanguineous marriages in order to prevent adverse outcomes for better health.

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