

Original Article**The effect of Consanguineous Marriages on Congenital Malformation***A. Mehrabi Kushki Msc*, B. Zeyghami PhD*****ABSTRACT**

Background: Consanguinity has been a long-standing social habit among some of Iranians. The estimation of consanguinity ratios in different parts of Iran ranged from 30 to 85%. This study aimed to delineating the role of consanguinity on congenital malformations in Khominishahr rural population, Isfahan, Iran.

Methods: In a case-control study, 518 malformed population (case group) and 518 normal subjects (control group) were randomly selected from khominishahr rural population, from July to November, 2003.

Results: The frequency of consanguinity of parent's was 59.7% in case group and 31.5% in control group. This different was statistically significant ($p < 0.001$).

Conclusion: Family history of congenital malformation may play an important role in the high rates of congenital malformation.

Key words: Consanguinity, Congenital Malformations

JRMS 2005; 10(5): 298-301

Consanguineous marriages have been described as an important factor contributing to increased congenital malformation. Estimated consanguinity ratios in different parts of Iran ranged from 30 to 85%¹. Because of high consanguinity rate within the Muslim population, the incidence of congenital malformation in the Islamic countries is between 10.0 to 45%².

This study aimed to delineating the role of consanguinity on congenital malformations in Khominishahr rural population, Isfahan, Iran.

Subjects and Methods

In a case-control study and simple random sampling, 518 patients and 518 normal subjects were selected from Khominishahr rural natives.

The case group included patients suffering from congenital malformation (defined as abnormality of structure or other certain genetic disorders)^{1, 3}. Of course, subjects were excluded due to other causes such as accident and stroke. The control subjects were not suf-

fering from any genetic disorders. Both groups were matched by age (± 3 years).

The information was collected, using a questionnaire from July 23 to November 21, 2003. The data were analyzed by SPSS software, using binary logistic regression.

Results

The average age of patients was 25 (± 12) years. Of 518 patients, 307 (59.3 %) were male and 211 patients (40.7%) were female.

The frequencies of malformations are shown in Figure 1. The frequencies of positive family history, familial marriage and degree of parents' relation are shown in Table 1 and 2.

Discussion

Increased incidence of genetic malformations in the offspring of consanguineous couples most likely arises from the homozygous expression of recessive genes inherited from their common ancestors⁴.

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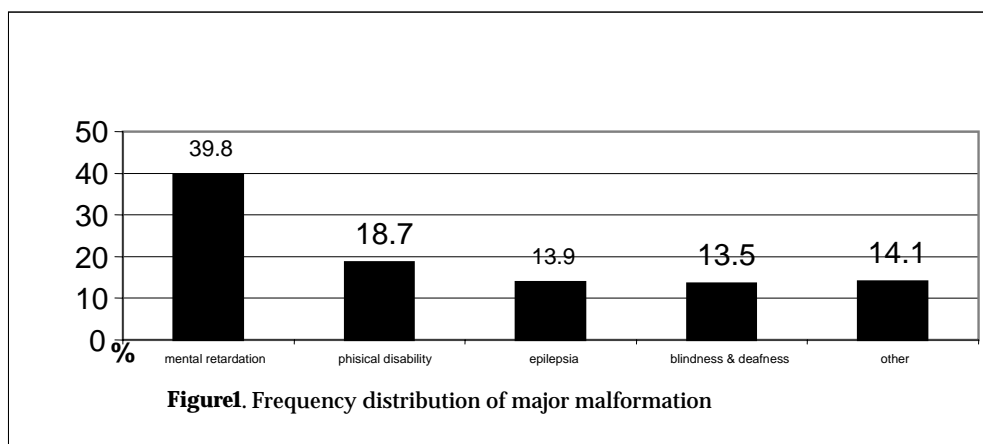


Table 1. The frequency of risk factors for congenital malformation

	Cases		Controls			Cases		Controls			
	n	%	n	%		n	%	n	%		
history Family:	No	285	55	472	91.1	Parents Awareness about consanguinity:	Yes	24	4.6	92	17.8
	Yes	233	45	46	8.9		No	494	95.4	426	82.2
Marriage:	No family	209	40.3	355	68.5	Birth order : first & Second third & 4 th above 4 th	1 st & 2 nd	195	37.6	255	49.2
	Family	309	59.7	163	31.5		3 rd & 4 th	164	31.7	121	23.4
							above 4 th	159	30.7	142	27.4
Degree of parents relation:	no family	209	40.3	355	68.5	Maternal age	18 – 35 years	245	47.3	382	73.8
	5 degree & +	39	7.5	20	3.9		below 18	40	7.7	68	13.1
	4 degree	53	10.2	20	3.9		above 35	233	45.0	68	13.1
	3 degree	217	41.9	123	23.7						

Table 2. Odds Ratio and confidence interval for risk factors

	OR	95% CI for OR	P value for OR	
Parent's marriage:	No family	1		
	Family	2.89	2.12 – 3.94	< 0.001
Family history :	no	1		
	yes	8.77	5.92 – 13.01	<0.001
Parents awareness :	yes	1		
	no	1.16	1.09 – 1.23	< 0.001
Maternal age :	18 – 35	1		
	Under 18	1.21	0.73 – 2.02	NS
	Above 35	5.85	4.07 – 8.42	< 0.001
Birth order :	1- 2	1		
	3 - 4	1.7	1.15 – 2.5	0.007
	above 4	1.07	0.73 – 1.57	NS

In this study, the consanguinity for malformed patients was higher than Mokhtari's study in Tehran; he showed that 44% of malformed babies had consanguineous couples⁵, but we can't find a relationship between malformation and degree of relation for parents. In the study of Bromiker in Palestine, no statistically significant difference was found in the incidence of malformation between the degrees of parents' relation⁶.

Many studies showed that positive family history is very important for congenital malformation:

In the Mokhtari's study, 93% of malformed children had a positive history of congenital malformation⁵. In our study, the Odds Ratio (OR) for family history was higher than Gupta's study (8.77 vs. 3.8)⁷.

The OR for mothers more than 35-years-old was higher in our study (5.85) more than the study of Egypt (3.19)⁸. This difference may be due to other undetermined genetic and environmental factors.

In our study, birth order was a risk factor for congenital malformations. Chaturvedi found an increase in frequency of congenital malformation in the primary and fourth gravida mothers⁹. The genetic researchers believe that the risk of mutation in the women with 3rd and higher gravid is higher than the women with primary or secondary gravida. In addition, malnutrition in these mothers is very

high. Malnutrition lead to reduce of birth weight and associated with congenital anomalies in children¹⁰.

We found a relationship between parent's awareness about consanguineous marriage and its risk for malformations. It is easy to understand that awareness is a preventative factor in congenital malformations and other hazardous factors. In one study in Saudi Arabia, there was an association between the level of education and consanguinity¹¹.

Finally, we conclude that the consanguinity and family history of congenital malformation may play an important role in the high rates of major malformation in their children and must be taken into account for genetic counseling in Iran.

For a possible prevention, we must apply the genetic counseling before marriage, not only for consanguineous couples but also for any couples that may have a family history of genetic disorders. Of course, currently suitable pre marriage counseling services are provided by the Iran's ministry of health, but still it can be improved.

Acknowledgment

Sincerely for Dr AliAsghar Sorouri associated professor of human genetic, for his excellent technical support.

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