

## The relation between consanguineous marriage and mental retardation of the offspring

### Brief Communication

Many children are born with congenital disorders every year all over the world. This tragic fact results in many problems in the family and the society [1, 2]. Consanguineous marriages are traditionally favored in most of the eastern Mediterranean region, south Asia and African countries especially in the Muslim populations [1-4]. It is well known that this type of marriage is a major factor responsible for some genetic disorders inherited in an autosomal recessive pattern [1-4]. Although consanguineous marriage is quite common in Iran, the information on its prevalence is too poor [5].

To evaluate the risk ratio of having a mentally retarded child by consanguineous married couples to that of unrelated couples, we would have needed a huge sample from the general population because of the rare incidence of mental retardation. So the study has two parts:

I: The rate of consanguineous marriage in Mashhad was estimated from the data collected in a sample survey from families living in Mashhad using stratified two stage cluster sampling with a grand total sample size of 1142 families with direct interviews.

II: Rate of consanguinity among couples who had at least one mentally retarded child was estimated from the data supplied by a simple random sample from records of patients in Behzisty center (total sample size =1270) and by cluster sampling from the records of the school

for MR students (total sample size = 669).

Based on the collected data, consanguineous marriage frequency in Mashhad was  $30.5 \pm 2.8$  percent compared to  $38 \pm 2.7$  among the parents of MR children registered to Behzisty organization and  $44 \pm 3.9$  among parents of MR children in disability schools (Fig.1). Using statistical methods for calculating risk ratio in indirect sampling we obtained a risk ratio of 1.4 for Behzisty data and 1.8 for disability schools data. These findings suggest a relation between consanguineous marriages and having MR offspring. Although the difference between two estimates is partly due to sampling error, it can also be expected as follows: It is conceivable to think that mentally retarded children have a higher chance of being trainable if the cause of the retardation is a consanguineous marriage rather than other unknown causes.

Also, the results of this study revealed that distant relative marriage frequency did not show any significant difference between the three groups (10.9% in Mashhad, 9.2% in Behzisty and 9.6% in schools), on the other hand, the rate of close relative marriages appear to be significantly different in the three group, which again emphasizes the effect of genetic similarity on congenital anomalies.

Although we estimated the rate of consanguineous marriage in Mashhad at 30.5 %, this rate was reported to be as high as 50% in United Arab Emirates, or 59% in Karachi, Pakistan [6-10], even in earlier studies in Iran this rate was also calculated to be more than what we have

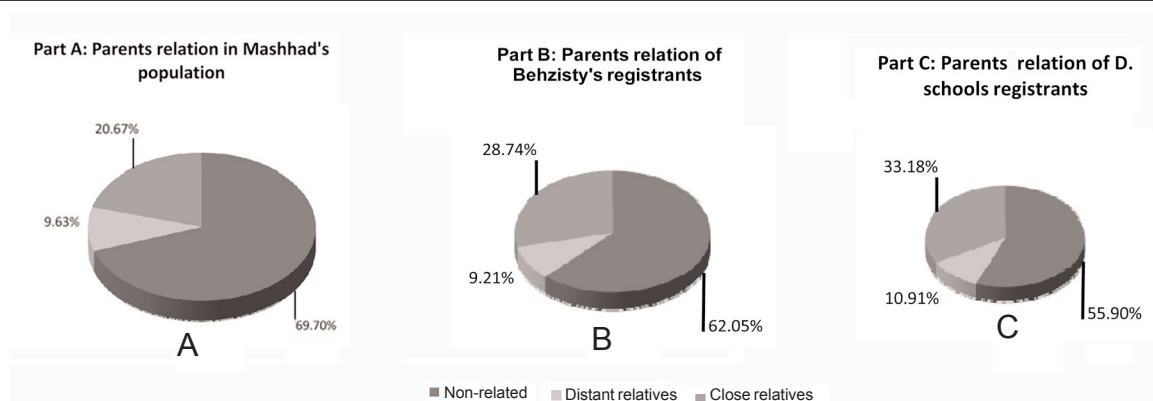


Fig. 1. The percentage of relationship between Parents, part A: Mashhad Population, part B: MR children registered in Behzisty org. and part C: MR children registered in disability schools.

estimated, 38% in Tehran and 45% in rural areas [11,12]. This might be due to increased immigration from rural areas to cities changing their life style and partially separating them from their families and relatives. The other explanation might be the change in adult's attitude towards marriage.

The main thrust towards a reduced frequency of consanguineous unions remains in the field of preventive genetics disorders such as in the form of general education of society. The public education may have to be taken at school level during adolescence to instill the biological risk of close marriages. Parents must be aware of the close associations of their children with the children of their brothers and sisters during their adolescence. Pre-marriage counseling for couples who have a family history of MR and preconception counseling for those with consanguineous marriage will facilitate informed family planning.

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### References

1. Bittles AH, Hussain R. An analysis of consanguineous marriage in the Muslim population of India at regional and state levels. *Ann Hum Biol* 2000 Mar; 27(2):163-71.
2. Hamamy H, Alwan A. Hereditary disorders in the eastern Mediterranean region. *Bull World Health Organ* 1994;72:145-54
3. Khoury SA, Massad DF. Consanguinity, fertility, reproductive wastage, infant mortality and congenital malformations in Jordan. *Saudi Med J* 2000;21: 150-4.
4. Mehndiratta MM, Paul B, Mehndiratta P. Arranged marriage, consanguinity and epilepsy. *Neurology Asia* 2007; 12 (Supplement 1): 15-17
5. Hasanzadeh Nazarabadi M, Rezaeetalab G, Dastfan

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F. Study of youths' knowledge, behavior, and attitude towards consanguineous marriages. *Iranian J Publ Health* 2004; 35(3):47-53

6. Mumtaz G, Tamim H, Kanaan M, Khawaja M, Khogali M, Wakim G, et al. Effect of consanguinity on birth weight for gestational age in a developing country. *Am J Epidemiol* 2007. 165(7):742-752.

7. Tamim H, Khogali M, Beydoun H, Melki I, Yunis K. Consanguinity and apnea of prematurity. *Am J Epidemiol* 2003; 158:942-946.

8. Hussain R. The effect of religious, cultural and social identity on population genetic structure among Muslims in Pakistan. *Ann Hum Biol* 2005; 32(2): 145-53.

9. Al-Gazali LI, Bener A, Abdulrazzaq YM, Micallef R, al-Khayat AI, Gaber T. Consanguineous marriages in the United Arab Emirates. *J Biosoc Sci* 1997 Oct; 29 (4): 491-7.

10. Bener A, Hussain R. Consanguineous unions and child health in the State of Qatar. *Paediatr Perinat Epidemiol* 2006; 20 (5): 372-8.

11. Saadat M, Ansari-Lari M, Farhud DD. Consanguineous marriage in Iran. *Ann Hum Biol* 2004 Mar; 31(2): 263-9.

12. Soruri A. Evaluation of common congenital disorders in Esfahan. *Journal of Esfahan Medical Faculty* 1989; 8(31).