

PREVALENCE OF CONSANGUINEOUS MARRIAGES IN WEST AND SOUTH OF AFGHANISTAN

MOSTAFA SAADAT AND KHADIJEH TAJBAKHSH

Department of Biology, College of Sciences, Shiraz University, Shiraz, Iran

Summary. The prevalence of consanguinity in eight provinces of Afghanistan has recently been reported by Saify & Saadat (2012). The present cross-sectional study was done in order to illustrate the prevalence and types of consanguineous marriages among other populations of Afghanistan. Data on types of marriages were collected using a simple questionnaire. The total number of couples in this study was 5200 from the following provinces: Farah, Ghazni, Herat, Hilmand, Kabul, Kandahar, Logar, Parwan and Wardak. Consanguineous marriages were classified by the degree of relationship between couples: double first cousins, first cousins, first cousins once removed, second cousins and beyond second cousins. The coefficient of inbreeding (F) was calculated for each couple and the mean coefficient of inbreeding (α) estimated for each population. The α in the country was 0.0226, ranging from 0.0203 in Farah province to 0.0246 in Herat province. There were significant differences between provinces for frequencies of different types of marriages ($p < 0.001$). First cousin marriages (21.7%) were the most common type of consanguineous marriages, followed by second cousins (16.0%), first cousins once removed (14.0%), beyond second cousins (6.9%) and double first cousins (1.6%). There was significant difference between ethnic groups for the types of marriages ($p < 0.001$). Tajiks (Soni) and Sadats showed the lowest ($\alpha = 0.0215$) and highest ($\alpha = 0.0242$) levels of consanguinity among ethnic groups in Afghanistan, respectively. The present study shows that the Afghani populations, the same as other Islamic populations, have high levels of consanguinity.

Introduction

It is suggested that consanguinity (union of individuals having at least one common ancestor) has been a long-standing social habit among populations (Saadat, 2007, 2008). The prevalence and patterns of consanguineous marriage depend on several demographic, religious, cultural and socioeconomic factors (Bittles, 2001, 2003; Saadat, 2007).

Although the rate of consanguineous marriage has declined markedly in many parts of the Western world (Bittles, 2003), it is still very common among African and

Asian countries (Khouri & Massad, 1992; Bittles, 2001; Saadat *et al.*, 2004; Othman & Saadat, 2009; Rafiee & Saadat, 2011). There are only two reports concerning consanguinity in the Islamic Republic of Afghanistan (commonly known as Afghanistan) (Wahab *et al.*, 2006; Saify & Saadat, 2012). The prevalence of consanguineous marriages in Afghanistan is very high. Wahab *et al.* (2006) reported the consanguinity from Nangarhar and Kunard provinces using a small sample size (168 couples). They reported that the mean inbreeding coefficient (α) in Afghanistan was 0.0332 (Wahab *et al.*, 2006). Recently Saify & Saadat (2012) reported on the consanguineous marriages in eight provinces of Afghanistan (Badakhshan, Baghlan, Balkh, Bamyan, Kabul, Kunduz, Samangan and Takhar). Interestingly, these provinces were mainly located in the east, north and north-east of the country. For this reason, the present study was conducted to determine the prevalence and patterns of consanguineous marriages in the west, south and south-east provinces of Afghanistan.

Methods

The present cross-sectional study was carried out in 2011 and 2012. For sampling a multistage design was used. Afghanistan is divided into 34 provinces. Nine provinces (Farah, Ghazni, Herat, Hilmand, Kabul, Kandahar, Logar, Parwan and Wardak) were included in the survey (Fig. 1). The selected provinces (clusters) were stratified into urban and rural areas. A total of 5200 couples (urban areas: 3151 couples; rural areas: 2049 couples) were included in the study. Data on consanguineous marriages



Fig. 1. Geographical distribution of study provinces in the Islamic Republic of Afghanistan. The map shows the mean of inbreeding coefficients (α) in provinces of Afghanistan from the present study and also from a previous study (Saify & Saadat, 2012).

and ethnicity (Pashtuns, Tajiks, Hazaras, Turkmens and Sadats) were collected using a simple questionnaire by interview. The questionnaires were completed by trained interviewers.

The coefficient of inbreeding (F) is the probability that an individual has received both alleles of a pair from an identical ancestral source, or the proportion of loci at which he is homozygous. Consanguineous marriages were classified by the degree of relatedness between couples: double first cousins ($F = 1/8$), first cousins ($F = 1/16$), first cousins once removed ($F = 1/32$), second cousins ($F = 1/64$) and beyond second cousins ($F < 1/64$). The mean inbreeding coefficient (α) was calculated for the population. Chi-squared contingency tests were used to compare mating pattern frequencies between populations. A probability of less than 0.05 was considered statistically significant.

Results

Table 1 shows the prevalence of the various types of consanguineous marriages in Afghanistan according to geographic locations. There was significant difference between provinces for frequencies of the types of marriages ($\chi^2 = 242.1$, $df = 40$, $p < 0.001$). Overall the proportion of consanguineous marriages in the country was 59.3%. The mean inbreeding coefficient (α) in the country was 0.0226, ranging from 0.0203 in Farah province to 0.0246 in Herat province.

The present data show that the overall frequency of consanguinity was 56.8% in urban and 63.2% in rural areas. The equivalent α values were 0.0223 and 0.0230 in urban and rural areas, respectively. There was significant difference between urban and rural areas for the types of marriages ($\chi^2 = 55.8$, $df = 5$, $p < 0.001$).

Table 2 shows the prevalence of the various types of marriages among ethnic groups in Afghanistan. There was significant difference between ethnic groups for the types of marriages ($\chi^2 = 282.8$, $df = 25$, $p < 0.001$). Tajiks (Soni) and Sadats showed the lowest ($\alpha = 0.0215$) and highest ($\alpha = 0.0242$) levels of consanguineous marriages among ethnic groups in Afghanistan.

Overall, first cousin marriages (21.7%) were the most common type of consanguineous marriages, followed by second cousins (16.0%), first cousins once removed (14.0%), beyond second cousins (6.9%) and double first cousins (1.6%).

Discussion

Here the prevalence of consanguinity in nine provinces of west, south and south-east Afghanistan is studied. Previously, nine other provinces (Badakhshan, Baghlan, Balkh, Bamyan, Kunduz, Samangan, Takhar, Nangarhar and Kunard), located in the east and north of Afghanistan, were studied (Wahab *et al.*, 2006; Saify & Saadat, 2012). The present results show that the prevalence of consanguineous marriages in Afghanistan is high (Table 1), confirming the findings of previous studies (Wahab *et al.*, 2006; Saify & Saadat, 2012). Although there are no data on other parts of Afghanistan, it is probable that in other parts of Afghanistan the frequency of consanguinity is high, as in the study provinces. Figure 1 shows the mean of inbreeding coefficients (α) in provinces of Afghanistan from the present study and the previous study by Saify & Saadat (2012). From comparison of the provinces of Afghanistan for levels of α , it seems that α is

Table 1. Prevalence of various types of consanguineous marriages in Afghanistan

Location	Double first cousins ($F = 1/8$)	First cousins ($F = 1/16$)	First cousins once removed ($F = 1/32$)	Second cousins ($F = 1/64$)	Beyond second cousins ($F < 1/64$)	Unrelated marriage ($F = 0$)	Total	Mean inbreeding coefficient (α)
Farah								
Urban	0	13	16	25	6	33	93	0.0190
Rural	0	11	16	6	0	24	57	0.0225
Total	0	24	32	31	6	57	150	0.0203
	(0)	(16.0)	(21.3)	(20.7)	(4.0)	(38.0)		
Ghazni								
Urban	12	117	71	43	28	228	499	0.0240
Rural	5	60	15	70	8	110	268	0.0225
Total	17	177	86	113	36	338	767	0.0235
	(2.2)	(23.1)	(11.2)	(14.7)	(4.7)	(44.1)		
Herat								
Urban	2	90	26	75	3	126	322	0.0245
Rural	0	16	7	16	0	20	59	0.0249
Total	2	106	33	91	3	146	381	0.0246
	(0.5)	(27.8)	(8.7)	(23.9)	(0.8)	(38.3)		
Hilmand								
Urban	0	11	34	15	0	38	98	0.0202
Rural	0	9	12	6	0	21	48	0.0215
Total	0	20	46	21	0	59	146	0.0207
	(0)	(13.7)	(31.5)	(14.4)	(0)	(40.4)		
Kabul								
Urban	5	201	101	104	87	434	932	0.0202
Rural	14	109	101	121	49	276	670	0.0210
Total	19	310	202	225	136	710	1602	0.0206
	(1.2)	(19.4)	(12.6)	(14.0)	(8.5)	(44.3)		
Kandahar								
Urban	2	20	28	20	0	49	119	0.0226
Rural	0	7	0	2	0	8	17	0.0276
Total	2	27	28	22	0	57	136	0.0232
	(1.5)	(19.9)	(20.6)	(16.2)	(0)	(41.9)		
Logar								
Urban	10	75	42	30	37	138	332	0.0244
Rural	1	12	6	5	1	23	48	0.0240
Total	11	87	48	35	38	161	380	0.0243
	(2.9)	(22.9)	(12.6)	(9.2)	(10.0)	(42.4)		
Parwan								
Urban	7	92	35	51	31	164	380	0.0232
Rural	4	64	113	106	21	117	424	0.0233
Total	11	156	147	157	52	281	804	0.0232
	(1.4)	(19.4)	(18.3)	(19.5)	(6.5)	(34.9)		
Wardak								
Urban	7	68	56	63	31	151	376	0.0217
Rural	15	104	50	75	59	155	458	0.0255
Total	22	172	106	138	90	306	834	0.0238
	(2.6)	(20.6)	(12.7)	(16.5)	(10.8)	(36.7)		
All nine provinces								
Urban	45	687	409	426	223	1361	3151	0.0223
Rural	39	392	319	407	138	754	2049	0.0230
Total	84	1079	728	833	361	2115	5200	0.0226
	(1.6)	(20.8)	(14.0)	(16.0)	(6.9)	(40.7)		

Numbers in parentheses are percentage of types of marriages.

Table 2. Prevalence of various types of consanguineous marriages among different ethnic groups of Afghanistan

Ethnic group	Double first cousins ($F = 1/8$)		First cousins ($F = 1/16$)		First cousins once removed ($F = 1/32$)		Second cousins ($F = 1/64$)		Beyond second cousins ($F < 1/64$)		Unrelated marriages ($F = 0$)		Total	Mean inbreeding coefficient (α)
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
Pashtun	31	2.3	274	20.0	230	16.8	152	11.1	84	6.1	598	43.7	1369	0.0229
Hazara	17	1.2	313	21.9	166	11.6	266	18.6	93	6.5	572	40.1	1427	0.0224
Tajik (Soni)	12	1.1	236	21.5	127	11.6	182	16.6	55	5.0	485	44.2	1097	0.0215
Tajik (Shi'a)	10	1.8	128	23.4	54	9.9	77	14.1	36	6.6	241	44.1	546	0.0229
Turkmen	6	1.2	78	15.7	121	24.4	110	22.2	29	5.8	152	30.6	496	0.0230
Sadats	8	3.0	50	18.9	30	11.3	46	17.4	64	24.2	67	25.3	265	0.0242
Total	84	1.6	1079	20.8	728	14.0	833	16.0	361	6.9	2115	40.7	5200	0.0226

higher in the north and north-east provinces compared with the south and west provinces of the country.

It is well established that consanguinity is strongly preferred in many Asian and African countries, including Islamic countries (Saha & El Sheikh, 1988; Khoury & Massad, 1992; Saadat *et al.*, 2004; Tadmouri *et al.*, 2009). Based on a previous report from Iran (Saadat *et al.*, 2004), there is a high frequency of consanguineous marriages in the Turkmen population ($\alpha = 0.0218$), which is comparable with the prevalence of consanguinity among the Turkmen population of Afghanistan ($\alpha = 0.0230$). Consanguinity rate is higher among Iranian Baluchis ($\alpha = 0.0294$), who live in the east of Iran (Saadat *et al.*, 2004), compared with the west and south-west provinces of Afghanistan (Table 1). Overall, the prevalence of consanguinity in Afghanistan ($\alpha = 0.0226$) is higher than that reported from Iran ($\alpha = 0.0185$; Saadat *et al.*, 2004). Mian & Mushtaq (1994) reported the prevalence of consanguinity in Quetta in Pakistan, which is located near Kandahar. In the present study, a higher rate of consanguinity was found for Kandahar ($\alpha = 0.0232$) than reported for Quetta ($\alpha = 0.0217$) by Mian & Mushtaq (1994). The prevalence of consanguinity in other parts of Pakistan (Bittles *et al.*, 1993) may be higher than in Afghanistan.

Consanguinity has been a long-standing social habit among populations (Bittles, 2001; Akrami & Ostai, 2007; Saadat, 2008). Attitude and practice toward consanguinity is deeply correlated with the historical background of a population (Bittles, 2001, 2003; Saadat, 2007, 2008). Similar to previous reports from Afghanistan, this study found a statistically significant difference between ethnic groups for prevalence of consanguineous marriages (Table 2). The difference between ethnic groups may be interpreted by differences in several demographic, cultural and socioeconomic factors.

The present study shows that there is a difference between rural and urban areas for prevalence of consanguinity, which is in agreement with reports from several other countries (Khoury & Massad, 1992; Othman & Saadat, 2009) and a previous report from Afghanistan (Saify & Saadat, 2012).

Because parental consanguineous marriage is associated with increased risk of recessive traits, and might also be associated with many multifactorial diseases (Bittles, 2001; Alper *et al.*, 2004; Saadat, 2005; Saadat & Zendeh-Boodi, 2006; Tadmouri *et al.*, 2009; Nafissi *et al.*, 2010, 2011; Saadat, 2011; Ul Haq *et al.*, 2011), there is an urgent need for public education programmes and more facilities for genetic counselling and reproductive risk assessment. The incidence of consanguinity and of first cousin marriages is found to be very high in Afghanistan.

Acknowledgments

The authors are indebted to the participants for their close co-operation. The authors would like to acknowledge the trained interviewers for their assistance during the course of this study. The authors are indebted to Dr Maryam Ansari-Lari for critical reading of the manuscript. This study was supported by Shiraz University.

References

- Akrami, S. M. & Osati, Z. (2007) Is consanguineous marriage religiously encouraged? Islamic and Iranian considerations. *Journal of Biosocial Science* **39**, 313–316.

- Alper, O. M., Erengin, H., Manguoglu, A. E., Bilgen, T., Cetin, Z., Dedeoglu, N. & Luleci, G.** (2004) Consanguineous marriages in the province of Antalya, Turkey. *Annales de génétique* **47**, 129–138.
- Bittles, A. H.** (2001) Consanguinity and its relevance to clinical genetics. *Clinical Genetics* **60**, 89–98.
- Bittles, A. H.** (2003) The bases of western attitudes to consanguineous marriage. *Developmental Medicine and Child Neurology* **45**, 135–138.
- Bittles, A. H., Grant, J. C. & Shami, S. A.** (1993) An evaluation of consanguinity as a determinant of reproductive behaviour and mortality in Pakistan. *International Journal of Epidemiology* **22**, 463–467.
- Khoury, S. A. & Massad, D.** (1992) Consanguineous marriage in Jordan. *American Journal of Medical Genetics* **43**, 769–775.
- Mian, A. & Mushtaq, R.** (1994) Consanguinity in population of Quetta (Pakistan): a preliminary study. *Journal of Human Ecology* **5**, 49–53.
- Nafissi, S., Ansari-Lari, M. & Saadat, M.** (2010) Effect of inbreeding on weight gain of offspring from birth to 12 months after birth: a study from Iran. *Journal of Biosocial Science* **42**, 195–200.
- Nafissi, S., Ansari-Lari, M. & Saadat, M.** (2011) Parental consanguineous marriages and age at onset of schizophrenia. *Schizophrenia Research* **126**, 298–299.
- Othman, H. & Saadat, M.** (2009) Prevalence of consanguineous marriages in Syria. *Journal of Biosocial Science* **41**, 685–692.
- Rafiee, L. & Saadat, M.** (2011) Prevalence of consanguineous marriages among Iranian Georgians. *Journal of Biosocial Science* **43**, 47–50.
- Saadat, M.** (2005) Epidemiology and mortality of hospitalized burn patients in Kohkiluyeh va Boyer-Ahmad province (Iran): 2002–2004. *Burns* **31**, 306–309.
- Saadat, M.** (2007) Consanguineous marriages in Iranian folktales. *Community Genetics* **10**, 38–40.
- Saadat, M.** (2008) Is consanguineous marriage historically encouraged? *Journal of Biosocial Science* **40**, 153–154.
- Saadat, M.** (2011) Association between healthy life expectancy at birth and consanguineous marriages in 63 countries. *Journal of Biosocial Science* **43**, 475–480.
- Saadat, M., Ansari-Lari, M. & Farhud, D. D.** (2004) Consanguineous marriage in Iran. *Annals of Human Biology* **31**, 263–269.
- Saadat, M. & Zendeheb-Boodi, Z.** (2006) Correlation between incidences of self-inflicted burns and means of inbreeding coefficients, an ecological study. *Annals of Epidemiology* **16**, 708–711.
- Saha, N. & El Sheikh, F. S.** (1988) Inbreeding levels in Khartoum. *Journal of Biosocial Science* **20**, 333–336.
- Saify, K. & Saadat, M.** (2012) Consanguineous marriages in Afghanistan. *Journal of Biosocial Science* **44**, 73–81.
- Tadmouri, G. O., Nair, P., Obeid, T., Al Ali, M. T., Al Khaja, N. & Hamamy, H. A.** (2009) Consanguinity and reproductive health among Arabs. *Reproductive Health* **6**, 17.
- Ul Haq, F., Jalil, F., Hashmi, S., Jumani, M. I., Imdad, A., Jabeen, M. et al.** (2011) Risk factors predisposing to congenital heart defects. *Annals of Pediatric Cardiology* **4**, 117–121.
- Wahab, A., Ahmad, M. & Shah, S. A.** (2006) Migration as a determinant of marriage pattern: preliminary report on consanguinity among Afghans. *Journal of Biosocial Science* **38**, 315–325.