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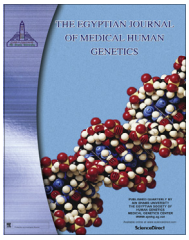

ORIGINAL ARTICLE

Association between consanguinity and survival of marriages

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KEYWORDS

Consanguinity;
Divorce;
Survival of marriage

Abstract *Background and purpose:* The present study was performed to investigate the association between consanguineous marriages and divorce risk.

Materials and methods: A total of 496 couples at divorce time and 800 couples from general population who have no plan for divorce (as control group) were included in the study.

Results: Compared to unrelated marriages, first cousin (OR = 0.39, 95% CI: 0.27–0.56, $P < 0.001$), first cousin once removed (OR = 0.18, 95% CI: 0.05–0.62, $P = 0.006$) and second cousin marriages (OR = 0.37, 95% CI: 0.17–0.78, $P = 0.009$) decreased the risk of divorce. The Cox proportional hazards regression analysis revealed that the survival of marriage was lower significantly for unrelated marriages than first cousin marriages, after adjusted for educational level (HR = 0.48, 95% CI: 0.35–0.67, $P < 0.001$).

Conclusion: The present findings indicate that consanguinity has some protective role(s) against divorce and also survival of marriages increased among consanguineous marriages. Considering that divorce rate is affected by several factors, replication of present findings in other populations is recommended.

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1. Introduction

Based on genetic studies it is well established that marriage and divorce have been found to be highly heritable [1,2]. Risk of marital instability increased in offspring of divorced parents [3].

Consanguineous marriage is defined as a union of second cousins or closer relatives. The prevalence of consanguinity is influenced by several factors including demographic, religious, cultural and socio-economic factors [4–8]. Many studies indicated that consanguineous marriages are associated with increased risk of recessive traits [9,10] and also it might be associated with many multifactorial diseases among their offspring [4,10–14]. It should be noted that the associations between consanguineous marriages and susceptibility to multifactorial disorders are controversial. Consanguineous marriage has declined remarkably in many parts of the Western world [4]. However, it is still very common among countries in Africa and Asia [4,15–19].

Based on a study reported from India, consanguineous marriages have a higher incidence of divorce, separation, and remarriage than unrelated marriages [20]. However, it has been reported that in Nubia (Egypt), among first cousin marriages divorce rate is lower compared to unrelated marriages [21].

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It is well established that divorce has important effects on family and community. Therefore, for countries such as our country (Iran), where the consanguineous marriage is common, the association between consanguinity and divorce is highly important. To the best of our knowledge, there is no study concerning the association between consanguinity divorce and comparison of survival analysis of marriages between consanguineous and unrelated marriages. Therefore, the present case-control study was carried out.

2. Subjects and methods

2.1. Study design and participants

The present case-control study was performed in Shiraz (Fars province, southern Iran). A total of 496 couples at divorce time (who attended to a divorce office) and 800 couples who have no plan for divorce (as control group) were included in the study. The control group was selected from general population of Shiraz. For sampling from general population we used the multistage design. Shiraz was divided into 4 parts (as clusters), and all of the clusters were included in the survey. In each cluster, stratified sampling according to the population size was carried out. Data on consanguinity and educational levels of couples were collected using a simple questionnaire by interview. The questionnaires were completed by trained interviewers. Consanguineous marriages were classified by the degree of relationship between couples: first cousins, first cousin once removed and second cousins.

All participants provided informed consent. This study was approved by the Shiraz University ethics committee. This work is carried out in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving animal experiments.

2.2. Statistical analysis

To evaluate the association of suggested independent variables (types of marriages and educational levels) with divorce, unconditional logistic regression analysis was used. The associations between the study of independent variables and risk of divorce were assessed by calculating odds ratios (ORs) and 95% confidence intervals (CIs). Variables with $p < 0.10$ in the univariate analysis were included in the final analysis.

Considering the low prevalence of first cousin once removed (25 out of 1296 couples) and second cousin marriages (42 out of 1296 couples), we used data of first cousin and unrelated marriages for the marriage survival analysis. The Cox proportional hazards regression model was used to evaluate the influence of types of marriages (first cousins vs. unrelated marriages) on survival of marriage. Divorce was defined as an event in the survival analysis.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) (version 11.5). A probability of $P < 0.05$ was considered statistically significant.

The study is more than sufficiently powered with an $N = 1296$ to detect a small-medium effect in allelic frequency between the two groups. Using the GPOWER (http://mac-download.informer. com/g-power/3.0/) software (version 3.1.1), to detect a real difference in allelic frequency with a power of 0.99, $\alpha = 0.01$, $df = 1$, Lambda = 24.04, and an effect size of 0.2; a minimum sample of 601 would be necessary.

3. Results and discussion

Prevalence of types of marriages, educational level, age and duration of marriages among study groups are shown in Table 1. In overall, the prevalence of consanguinity among ongoing and divorce marriages was 25.0 and 10.9 percent, respectively. Based on several studies first cousin marriages were the commonest of all matings among Iranian population [16]. However, this type of marriages was very low among divorce marriages (8.5%). There was no double first cousin marriage among the study sample. Marriages of first cousins (OR = 0.39, 95% CI: 0.27–0.56, $P < 0.001$), first cousin once removed (OR = 0.18, 95% CI: 0.05–0.62, $P = 0.006$) and

Table 1 Association between type of marriages and educational levels and risk of divorce.

Variables	Marital status		OR	95% CI	*P*-value
	Ongoing	Divorce			
Types of marriages					
Unrelated	600	442	1.0	–	–
Second cousin	33	9	0.37	0.17–0.78	0.009
First cousin once removed	22	3	0.18	0.05–0.62	0.006
First cousin	145	42	0.39	0.27–0.56	<0.001
Educational level (Wives)					
High school or lower	471	315	1.0	–	–
College and higher	329	181	0.82	0.65–1.04	0.097
Educational level (Husbands)					
High school or lower	411	319	1.0	–	–
College and higher	389	177	0.58	0.46–0.73	<0.001
Continuous variables	Mean ± SD	Mean ± SD	*df*	*t*	*P*-value
Age (Wives)	37.7 ± 10.9	29.8 ± 8.8	1294	14.3	<0.001
Age (Husbands)	42.9 ± 12.4	34.2 ± 10.4	1294	13.6	<0.001
Duration of marriages	15.7 ± 12.1	7.5 ± 8.0	1294	14.7	<0.001

second cousins (OR = 0.37, 95% CI: 0.17–0.78, $P = 0.009$) compared to unrelated marriages, decreased the risk of divorce. Also, a higher level of educations negatively correlated with the risk of divorce (Table 1). Although the present finding is consistent with a report from Egypt [21], it is not consistent with the study of Mutharayappa [20] who reported that in India consanguineous groups have a higher incidence of **divorce** than unrelated marriages [20]. The discrepancy may be interpreted by differences in social factors between our population and India. Very recently, Bhopal et al. reported their study on a large sample size from the Born in Bradford cohort study. They reported that the consanguineous marriages have less divorce [22], which is consistent with our present finding. However, similar studies with larger samples concerning detailed data on risk factors for divorce from different ethnic groups are needed to verify this initial finding.

Table 2 shows the marital status (ongoing and divorce) according to type of marriages in each period of marriages. In all of the period of marriages the prevalence of first cousins was less than unrelated marriages in divorce group compared with the ongoing marriages. Therefore we performed the survival analysis in order to study the association between type of marriages (first cousins vs. unrelated marriages) and duration of marriages. The association between consanguinity and survival of marriages is shown in Fig. 1. The Cox proportional hazards regression analysis revealed that the survival of marriages was lower significantly for unrelated marriages than first cousin marriages, after being adjusted for educational level (HR = 0.48, 95% CI: 0.35–0.67, $P < 0.001$).

It is suggested that consanguineous marriages are deeply rooted [6–8]. The high level of consanguinity is a feature of many Asian and African populations [4,15–19]. Therefore it might be concluded that consanguineous marriages are a way which chosen by these populations in order to maintain their own social stability. Our present results indicate that consanguinity has some protective role(s) against divorce and also survival of marriages increased among consanguineous marriages. Taken together it might be concluded that consanguinity has social advantages. On the other hand, consanguineous marriages are associated with increased risk of recessive traits and also it might be associated with many multifactorial diseases [4,10–14]. However, activities for reduction of consanguinity which is culturally favored in population, without attention to its social reflections, are not recommended.

Table 2 Marital status according to type of marriages in each period of marriages.

Duration of marriages	Type of marriages	Marital status	
		Ongoing	Divorce
⩾1 year	Unrelated	58	80
	First cousin	11	8
1.1–5 years	Unrelated	86	164
	First cousin	26	15
5.1–10 years	Unrelated	104	96
	First cousin	23	9
10.1–20 years	Unrelated	165	61
	First cousin	42	6
<20 years	Unrelated	187	41
	First cousin	43	4

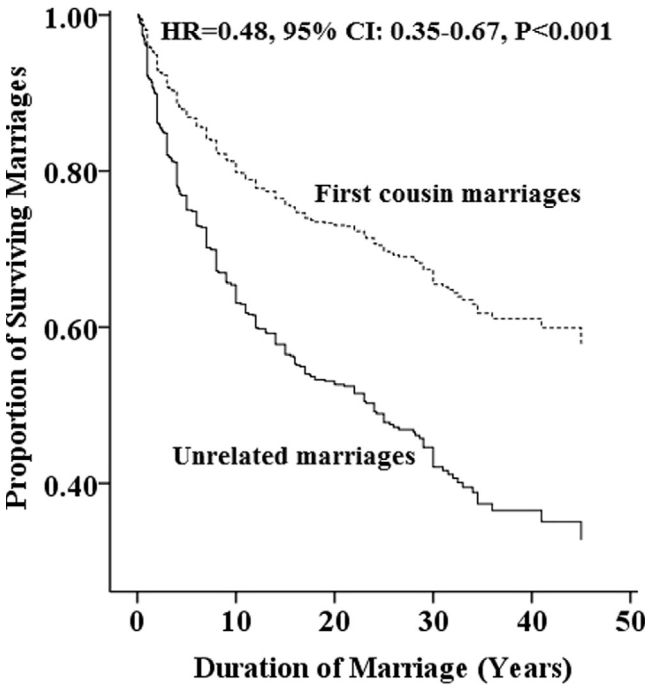

Figure 1 Association between consanguineous marriages and survival of marriages.

Because divorce rate is affected by several factors such as demographic, cultural and socio-economic and religious, it is self evident that replication of present findings in other populations is recommended.

Disclosure statement

The author declares no conflict of interest.

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