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The pattern of Inbreeding in a population of Tuman Leghari District Dera Ghazi Khan

Ayaz Ahmad [1*], and Dr. Asma Saeed [2]

[1]Assitant Professor of Biology, Governament Degree College Block.no.17.Dera Ghazi Khan,Punjab. Pakistan
[2]Assitant Professor of Biochemistry, Institute of Biological Sciences Gomal University D.I.Khan ,KPK.Pakistan
*Corresponding author

Abstract

The inbred marriages are highly acceptable in many populations of human beings but their prevalence and configuration vary depending on ethnicity, religious conviction, learning and socioeconomic circumstances of the relevant population.[1]. This study focuses on inbred marriages in the general population of Tuman Leghari resident in district D.G.Khan, Punjab, Pakistan because of its exclusive geographical position and population arrangement. The population is mainly a mixture of Leghari, Khosa included in Baloch, and Saraiki other than Baloch which represents different ethnic groups. During data collection, 406 families were approached indiscriminately to study the frequency of inbreeding. Ethnically the highest positive response was found in Saraiki (other than Baloch) 47.30% than Leghari (32.26%) or Khosa (20.44%). The Saraiki other than Baloch, Khosa, and Leghari families were 47.30%, 32.26%, and 20.44% respectively. Inbred marriages were more prevalent in Tuman Leghari Tribe of DG Khan District. The ratios of such inbred marriages in different ethnic populations were studied to be: Saraiki other than Baloch 46.24%, Leghari 35.10% and Khosa 18.66%. There were many differences found between the frequency of inbred and outbred marriages of the total sample as well as within the ethnic groups, Leghari, and Khosa (X^2=10.87 P<0.001; X^2=47.45 P<0.001 and X^2=03.73 P<0.001 respectively. Statistical analysis shows the significant difference among various types of marriages in Leghari, Khosa and Saraiki other than Baloch (X^2=20.00 P<0.001). A significant difference was observed in Leghari and non-significant difference observed in Khosa and Saraiki other than Baloch with 10.87, 27.09 and 3.73 Chi values respectively. The calculated mean inbreeding coefficient (F) for the total population was 0.0287. There were three groups formed on male education in order to assess the effect of education on the inbred marriages at the time of marriage in total samples represents the lower, middle and higher levels of male education comprised Leghari 81 (19.95%), 141 (34.72%) and 184 (45.32%) couples, respectively. Male education found to be statistically significant in Saraiki other than Baloch group. Similarly, in order to assess the impact of female education on the marriage types, the sample was divided into three groups based on female schooling years at the time of marriage. In total samples, representing the lower, middle and higher levels of male education comprised Leghari 114 (19.95%), Khosa 133 (34.72%) and Saraiki other than Baloch 184 (45.32%) couples, respectively. Female education found to be statistically significant in Khosa group. The effect of the socioeconomic status of male on marriages was also studied; the sample was distributed in three groups on the basis of the socioeconomic status of the male at the time of marriage. The total sample representing the lower, middle, and higher levels comprised Leghari 120 (29.56%), Khosa (131 (32.26%) and Saraiki other than Baloch 155 (38.18%). The statistical analysis uncovers significant results in total and Leghari ethnic groups. In order to find the impact of the socioeconomic status of female on inbred marriage, the sample was divided into three groups based on female socioeconomic status at the time of marriage. The total sample representing the lower, middle, and higher levels comprised Leghari 108 (26.60%), Khosa 152 (37.44%) and Saraiki other than Baloch 146 (35.96%). The statistical analysis uncovers significant results in the total sample, Leghari and Saraiki other than Baloch ethnic groups.

Keywords: Inbreeding, Outbreeding, Tuman Leghari, Khosa, Saraiki other than Baloch
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Introduction

Inbreeding marriages are described as a social contract among the individuals which have blood relations. This includes such type of relations which are termed as first cousins, second cousins and distantly related [2]. Inbreeding coefficient (F) is defined as the measure of the extent of alleles with indistinguishable duplicates which are communicated in the posterity of inbreeding from both of the parents. If the inbreeding coefficient (F) is equal or more than 0.0156 then it is considered as an inbred marriage [3-4].

Materials and methods

Data Collection

With a specific end goal to investigation of inbreeding family's inhabitant in Tuman Leghari District Dera Ghazi Khan, a questionnaire was planned and conveyed in the study region to gather the applicable data amid the field review. The information gathering was finished in six months beginning from September 2015 to February 2016. During the overview, 406 families were met for information accumulation. For the present concentrate, family is characterized as an accumulation of persons related by blood or marriage, having the same salary source and living in the same home. The particular point of interest of different parameters are as follows: Ethnicity, Couple's Relationship, Marriage Types, Socio-economic Status of male and female, Education level of couples

Statistical Analysis

The data was statistically analyzed by chi-square values.

Results and discussion

Ethnically the most astounding positive reaction was found in Saraiki (other than Baloch) 47.30% than Leghari (32.26%) or Khosa (20.44%). Table 1 presents relative numbers and percent frequencies of families having a place with various ethnic groups and managerial ranges inside of the example. The Saraiki other than Baloch, Khosa and Leghari families were 47.30%, 32.26%, and 20.44%, respectively.

Mean Inbreeding Coefficient (F)

The mean inbreeding coefficient (F) for the aggregate population was ascertained as 0.0287 Moreover, the mean inbreeding coefficients (F) for the Baloch and Saraiki other than Baloch populations were likewise discovered high (Table 5).

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Table1: Data summary on basis of tribes in Tuman Leghari Dera Ghazi Khan

Ethnicity	**Number**	**Percentage**
Leghari	131	32.3
Khosa	83	20.4
Saraiki Other than Baloch	192	47.0
Total	**406**	

Table 2: Statistical analysis for comparison of inbreeding and out breeding marriages between Leghari, Khosa and Saraiki other than Baloch couples from Tuman Leghari

Samples	**Inbreeding**	**Out breeding**	**Total**	**X^2**
Leghari	126 (35.1 %)	05 (10.6%)	131 (32.3%)	10.87; P < 0.001
Khosa	67 (18.7 %)	16 (34.0%)	83 (20.4%)	47.45; P < 0.001
Saraiki Other than Baloch	166 (46.2 %)	26 (55.3%)	192 (47.0%)	03.73; P < 0.001
	359 (88.4 %)	47 (11.6%)	406	34.05; P < 0.001

Table 3: Distribution of Marriage types in Ethnic groups of Tuman Leghari Tribe

Types of Marriages	**F**	**Leghari**	**Khosa**	**Non Baloch**	**Total**
FC	0.3821	49 (37.4%)	36 (43.4%)	72 (37.5%)	157 (38.7%)
SC	0.1301	37 (28.2%)	16 (19.3%)	53 (27.6%)	106 (26.1%)
DR	0.1085	40 (30.5%)	15 (18.1%)	31 (16.2%)	86 (21.2%)
NR	0	05 (3.8)	16 (19.3%)	36 (18.7%)	57 (14.0%)
Total	0.1354	131 (32.3%)	83 (20.4%)	192 (47.3%)	406

X^2= 20.00 P> 0.001

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Table 4: Comparison of inbred and outbreed marriages in Leghari, Khosa and Saraiki other than Baloch

Sample	**Mean F**	**IM**	**OM**	**Total**	**X^2**
Leghari	0.0301	126 (35.1%)	05 (10.6%)	131 (32.3%)	10.87 P < 0.001
Khosa	0.0256	67 (18.7%)	16 (34.0%)	83 (20.4%)	47.45 P<0.001
Saraiki Other than Baloch	0.0303	166 (46.2%)	26 (55.3%)	192 (47.3%)	3.73 P < 0.001
Total	0.0287	359 (88.4%)	47 (11.6%)	406	16.160.001<**P**<0.005

X^2=16.16; 0.005< P < 0.001 IM= Inbreeding marriages OM= Out breeding marriages

Table.5: Inbreeding coefficient (F), inbreeding and out breeding marriages with respect to husband's education

Population	**Mean F and Inbreeding**	**Husband's education level**			**Total**
		Lower	Middle	Higher	
Mean Inbreeding coefficient (F)		0.0272	0.0292	0.0311	
Leghari	Inbreed	16	27	39	82
	Outbreed	11	17	21	49
	Total	27	44	60	131
	X^2= 0.33 0.90 < P< 0.75				
Mean Inbreeding coefficient F		0.0291	0.0301	0.0251	
Khosa	Inbreed	10	17	24	51
	Outbreed	07	12	13	32
	Total	17	29	37	83
	X^2= 0.26 0.90 < P< 0.75				
Mean Inbreeding coefficient F		0.0303	0.0249	0.0310	
Saraiki other than Baloch	Inbreed	22	37	48	107
	Outbreed	15	31	39	85
	Total	27	68	87	192
	X^2= 4.07 P>0.001				
Mean Inbreeding coefficient F		0.0290	0.0249	0.0271	
Total	Inbreed	48	81	111	240
	Outbreed	33	60	73	166
	Total	81	141	184	406
	X^2=0.21 P>0.001				

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Table 6: Inbreeding coefficient (F), inbreeding and outbreeding marriages with respect to the Female's educational level

Population	**Mean F and Marriage type**	**Female's education level**			**Total**
		Lower	Middle	Higher	
Mean Inbreeding coefficient F		0.0261	0.0279	0.0301	
Leghari	Inbreed	31	18	37	86
	Outbreed	13	11	21	45
	Total	44	29	58	131
	X^2=0.64 0.90 < P< 0.75				
Mean Inbreeding coefficient F		0.0302	0.0305	0.0307	
Khosa	Inbreed	15	21	14	50
	Outbreed	07	09	17	33
	Total	22	30	31	83
	X^2=40.96 0.90 < P< 0.75				
Mean Inbreeding coefficient F		0.0280	0.0202	0.0278	
Saraiki other than Baloch	Inbreed	31	43	44	118
	Outbreed	17	31	26	74
	Total	48	74	70	192
	X^2=0.69 P>0.001				
Mean Inbreeding coefficient F		0.0265	0.0271	0.0222	
Total	Inbreed	77	82	95	254
	Outbreed	37	51	64	152
	Total	114	133	159	406
	X^2=2.61 P>0.001				

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Table 7: Inbreeding coefficient (F), inbreed and outbreed marriages with respect to socio-economic status of male

Population	**Mean F and Marriage type**	**Male's Socioeconomic status**			**Total**	
		Lower	Middle	Higher		
Mean Inbreeding coefficient F		0.0211	0.0256	0.0215		
Leghari	Inbreed	34	21	40	95	
	Outbreed	17	13	06	36	
	Total	51	34	46	131	
	X^2=8.55 0.90 < P< 0.75					
Mean Inbreeding coefficient F		0.0311	0.0301		0.0305	
Khosa	Inbreed	13	19		17	49
	Outbreed	09	11		14	34
	Total	22	30		31	83
	X^2=1.02 0.90 < P< 0.75					
Mean Inbreeding coefficient F		0.0256	0.0298		0.0227	
Saraiki other than Baloch	Inbreed	23	37		48	108
	Outbreed	24	30		30	84
	Total	47	67		78	192
	X^2=1.67 P>0.001					
Mean Inbreeding coefficient F		0.0311	0.0305		0.0301	
Total	Inbreed	70	77		105	252
	Outbreed	50	54		50	154
	Total	120 (29.56%)	131 (32.26%)		155 (38.18%)	406
	X^2=8.32 P>0.001					

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Table 8: Inbreeding coefficient (F), inbreeding and outbreeding marriages with respect to the Female's educational level

Population	**Mean F and Marriage type**	**Female's Socio-economic status**			**Total**
		Lower	Middle	Higher	
Mean Inbreeding coefficient F		0.0231	0.0241	0.0253	
Leghari	Inbreed	27	19	39	85
	Outbreed	16	18	12	46
	Total	43	37	41	131
	X^2=9.05 0.90 < P< 0.75				
Mean Inbreeding coefficient F		0.0256	0.0271	0.0278	
Khosa	Inbreed	13	23	19	55
	Outbreed	08	11	09	28
	Total	21	34	28	83
	X^2=0.21 0.90 < P< 0.75				
Mean Inbreeding coefficient F		0.0311	0.0321	0.0325	
Saraiki other than Baloch	Inbreed	29	45	49	123
	Outbreed	15	36	18	69
	Total	44	71	67	192
	X^2=6.28 P>0.001				
Mean Inbreeding coefficient F		0.0341	0.0361	0.0357	
Total	Inbreed	69	87	107	263
	Outbreed	39	65	39	143
	Total	108 (26.6%)	152 (37.4%)	146 (35.9%)	406
	X^2= 8.4 P>0.001				

In this study, a questionnaire was distributed and our outcomes furthermore demonstrated that 70.52% marriages in the overall population and relational unions in all inclusive community respectively 35.10%, 18.66%, and 46.24% are inbred (Table 2 and 3) This study revealed a high rate of inbreeding 88.42% with 0.0201 mean coefficients of inbreeding by and large population (Table 4) our outcomes are in accord with the results of a past study aimed at Pakistan level.[5-6].

Some of the possible reasons of high frequency of inbreeding may be:

1. Tribalism is intensely recognized in progress account of population understudy.

2. High rate of inbreeding alongside the variables like geological conditions, where decision of proper companion gets to be constrained outside family. [7-8].

3. More distant family culture presence in the range expands shot of inbreeding.

Conclusion

In this study, we concentrated on the impact of guidance (both male and female), male financial status, and male occupation on predominance of inbreeding. Rate of inbreeding is as a result firmly connected with these components (Table 5 and 6). However intriguing circumstance showed up, when we examined the impact of these components in ethnic groups.[9-10]. Among Leghari and Khosa, the concentrated on parameters have noteworthy impact in diminishing the inbreeding relational unions however shockingly the relative commitment of every one of these variables stay less unequivocal (obvious) in Saraiki's. The imaginable reasons of this rigorous disposition of Saraiki may be the social standard connected with their inception. (Table 7 and 8).

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Conflict of Interest

We declare that we have no conflict of interest.

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