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Consanguinity in Population of Quetta (Pakistan): A Preliminary Study

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ABSTRACT Analysis of 171 families (542 pregnancies) suggest that 85.38% marriages occur within caste and major part of marriage partners are Ist cousins (26.90%), within sub-ethnic group (23.39%) or within ethnic group (25.15%). Incidence of prenatal death (abortion, still birth) increases with consanguinity. Overall lethal effect is high in Baloch (23.97%), medium in Pathan and Jat (10-11%) and low in Araeen (4.77%) ethnic groups. The average age at marriage (27.49, 21.85 years), mean time taken for first pregnancy (1.60 years) and number of children per couple (2.54) are not significantly different in different ethnic groups, marriage types, or origins. A gradual increase in age at marriage and a decrease in time taken for first pregnancy and number of children with the increasing economic status is recorded. There is a high correlation between ages of marriage partners.

INTRODUCTION

The information on consanguinity and its effects help in understanding the present population status and its future potentials. Shami and his coworkers (1982-85) have collected some useful data in this direction from different districts of central Punjab (Pakistan). No such study is available for Balochistan. The present attempt presents some preliminary data on the population of Quetta (Balcohistan, Pakistan).

MATERIAL AND METHODS

A sample of 171 families was drawn out of the visitors of the gynaecology wards of the local hospitals, as per co-operation of the mother. The information on ethnic origin, blood relations of husband and wife, age at the time of marriage/first pregnancy, pregnancy records, origin (rural/urban) and economic status was extracted directly from the potential mothers. The parental relationship identified in the present sample were: first cousins (1C), second cousins (2C), within family (F; distantly related), near relatives (NR; not directly related but belonging to same Baradri/isonymic group), sub-group (SG), group (G), outside (O; unrelated). The data was analysed using general statistical techniques (Mather, 1957). Quetta is the provincial headquarter of the south-western province of Pakistan (Balochistan). The population of the town derives its origin from different roots. Balochs are the ancient settlers of the province, coming partly from Dravidian and partly from early Aryan settlers of the subcontinent. Pathans, coming from the late Aryan origin, are settlers of northern parts of the province and the adjacent province of NWFP. Jats are the general settlers of Punjab, while Araeens are mainly settled in Punjab and represent the stock produced by the marriages between the settlers from Middle East and the local population (Abdulla, 1973; Gankovsky, 1973; Johnson, 1973; Khan, 1985).

RESULTS

The frequencies of different types of marriages (Table 1) suggest that the major part of the marriages (85.38%) occur within the broad ethnic group. The frequency of marriages within ethnic group is the maximum in Baloch, followed by Araeen, Pathan and the minimum

in Jat. Cousin marriages (1C and 2C) have occurred in 32.16% (mostly 1C=26.90%) of the couples in the average population. The frequency of cousin marriages is high in Jat (43.86%); medium in Baloch (35.92%) and Araeen (30.95%) and low in Pathan (20.41%) groups. The marriages between distant relations have occurred in 48.54% of the couples (mainly within sub-group, 23.39% and group, 25.15%) of the general population.

The analysis of 542 pregnancies (Table 2) suggests that the prenatal deaths are more frequent in cousin marriages (1C=9.03; 2C= 14.71%; overall=10.11%), followed by marriages between distant relations (F=5.26%, NR= 0%; SG=5.56%; G=5.60; overall=5.14%) and the lowest in the marriages occurring out of the group (2.78%). The frequency of both abortions and still births are higher in cousin marriages (5.62%, 4.49%) as compared with marriages occurring between distant relations (0.6%, 2,18%) or out of the group (1.39%, 1.39%). No consistent pattern appears to be followed in different types of marriages with regard to the postnatal deaths and/or abnormalities, though these are generally high in the marriages occurring within caste as compared with those occurring outside.

There is a considerable variation in the incidence of prenatal and postnatal deaths in different ethnic groups (Table 3). Baloch exhibit high overall lethal effect (23.97%), Pathan, and Jat groups bear the medium (10-11%), while Araeen a low (4.77%). Such a pattern is also exhibited to a certain degree in prenatal deaths, though Pathan exbihit low postnatal deaths and abnormalities.

The average age at the time of marriage (Table 4) is 27.49±0.49 and 21.85±0.49 years, for males and females. There appears no significant difference in the ages at the time of marriage of neither males nor females, between different ethnic groups, types of marriage and/or origins, when judged by the methods of maximum approximation. There is a significant gradual increase in the average age of both males and females with the increasing economic status. The computation of t-values suggest that there is a significant difference between the sexes with regard to age at marriage, the males having higher values as compared with the females. The values of coefficient of variance has been generally low, suggesting a low variability with regard to this parameter.

The mean time taken for the first birth in our sample of population is 1.60±0.13 years, while the average number of children per couple is 2.54±0.15 (Table 4). There is no significant difference between ethnic groups, marriage types and/or origins, when judged by methods of maximum approximation, neither of the mean time taken for the first delivery nor for the number of children per couple. However, there appears a gradual decrease in the mean time taken for the first birth and average number of children per couple with the increasing economic status of the family.

Table 1 : Frequency (%) of different types of marriages in different ethnic groups. Figures in parenthesis represent numbers observed. 1C = first cousin, 2C = second cousin, F = within family, NR = near relatives, SG = within sub-group, G = within group, O = outside

Ethnic Groups	*n*	*1C*	*2C*	*F*	*NR*	*SG*	*G*	*O*
Pathans	49	16.33 (8)	4.08 (2)	0.00 (0)	2.04 (1)	34.69 (17)	26.53 (13)	16.53 (8)
Baloch	34	32.35 (11)	2.94 (1)	2.94 (1)	2.94 (1)	26.47 (9)	23.53 (8)	8.83 (3)
Jats	46	36.96 (17)	6.52 (3)	0.00 (0)	2.17 (1)	28.26 (13)	8.70 (4)	17.39 (8)
Araeen	42	23.81 (10)	7.14 (3)	7.14 (3)	2.38 (1)	42.86 (18)	42.86 (18)	14.29 (6)
Total	171	26.90 (46)	5.26 (9)	2.34 (4)	2.34 (4)	23.39 (40)	25.15 (43)	14.62 (25)

Table 2 : Incidence (%) of prenatal and postnatal deaths/abnormalities in different types of marriages. Figures in parenthesis indicate observed frequencies. IC = Ist cousin, 2C = 2nd cousin, F = within family, NR = near relatives, SG = within sub-group, G = within group, O = outside

Particulars	*1C*	*2C*	*F*	*NR*	*SG*	*G*	*O*	*Average*
Total Pregnancies	(144)	(34)	(38)	(21)	(108)	(125)	(72)	(542)
Prenatal deaths	9.03 (13)	14.71 (5)	5.26 (2)	0.00 (0)	5.56 (6)	5.60 (7)	2.78 (2)	6.46 (35)
Abortion	4.17 (6)	11.76 (4)	0.00 (0)	0.00 (0)	1.85 (2)	0.80 (1)	1.39 (1)	2.58 (14)
Stillbirth	4.86 (7)	2.94 (1)	5.26 (2)	0.00 (0)	3.70 (4)	4.80 (6)	1.39 (1)	3.87 (21)
Livebirth	90.97 (131)	85.29 (29)	94.74 (36)	100.00 (21)	94.44 (102)	94.40 (118)	97.22 (70)	93.54 (507)
Postnatal death	2.29 (3)	0.00 (0)	2.77 (1)	0.00 (0)	3.92 (4)	0.00 (0)	1.43 (1)	1.58 (8)
Postnatal abnormalities	0.78 (1)	0.00 (0)	5.71 (2)	4.76 (1)	4.08 (4)	2.54(3)	2.89 (2)	2.56 (13)
Total lethal effect	12.37	14.71	13.74	4.76	14.48	8.14	7.1	10.86

Table 3 : Incidence (%) of prenatal and postnatal deaths/abnormalities in different ethnic groups. Figures in parenthesis indicate observed frequencies

Particulars	*Pathans*	*Baloch*	*Jats*	*Araeen*
Total pregnancies	147	71	129	106
Prenatal death	8.84 (13)	12.68 (9)	3.87 (5)	1.89 (2)
Abortion	2.72 (4)	1.41 (1)	3.87 (5)	1.89 (2)
Stillbirth	6.12 (9)	11.27 (8)	0.00 (0)	0.00 (0)
Livebirth	91.16 (134)	87.32 (62)	96.13 (124)	98.11 (104)
Postnatal death	0.75 (1)	3.23 (2)	2.42 (3)	0.96 (1)
Postnatal abnormalities	0.75 (1)	8.06 (5)	4.03 (5)	1.92 (2)
Total lethal effect	10.34	23.97	10.32	4.77

DISCUSSION

Our results suggest that though there is some degree of intergroup variation (91.17% in Balochs to 82.61% in Jats), yet majority of the marriages (average 85.38%) in our population are occurring within caste. This appears to be a general pattern of the populations of Indo-Pakistan subcontinent. The studies of Shami and his coworkers in the central Punjab, Pakistan, have suggested that the marriages occurring outside the caste range between 2.61% (Sahiwal : Shami and Shujaat, 1985) and 33% (Jhelum: Shami and Minhas, 1984). The intergroup variation can be attributed to socio-culture-economic conditions of the area of their general settlement.

The incidence of cousin marriages in the present population is 32.16%, which fluctuates between 43.86% (Jats) and 20.41% (Pathans). The incidence of cousin marriages in Jats falls fairly close to those suggested for different populations of Punjab (Sheikhupura, 48.86%, Shami and Iqbal, 1983): Gujarat, 48.50%, Shami and Hussain, 1984; Lahore, 47.12%, Shami and Zahida, 1982; Mianchannu, 36.45%, Muridke, 40.24%, Shami 1983; Jhelum, 44.30% Shami and Minhas, 1984). Such a similarity is explainable on the fact that Jats are the

Table 4 : Mean ± standard error of mean (coefficient of variance) of different characters and coefficient of correlation in male and female marriage partners in different marriage types, ethnic groups, origins and economic status.* (* = correlation coefficient significant at .005 level)

Particulars	*Age (year)*			*Time taken for first birth (in years)*	*Children per couple*
	Father	*Mother*	*Correlation coefficient*		
Marriage Types :					
Ist cousin	27.61±0.76 (21.46)	22.72±0.54 (18.54)	0.2210*	1.64±0.31 (87.53)	2.33±0.28 (86.67)
2nd cousin	26.08±1.71 (22.74)	22.67±1.25 (19.12)	0.2611*	3.00±0.76 (52.70)	2.82±0.77 (90.91)
Within family	26.00±1.40 (15.25)	20.13±1.77 (24.84)	0.1965*	1.50±0.27 (50.40)	4.38±85 (55.90)
Near relative	26.60± 2.62 (22.02)	22.80±2.27 (22.23)	0.3205*	1.00±1.00	3.50±0.85 (59.25)
Within sub-group	26.87±0.77 (19.10)	21.16±0.66 (20.90)	0.1596*	1.28±0.08 (39.67)	3.00±0.41 (85.40)
Within group	26.96±0.73 (18.56)	23.13±1.66 (49.26)	0.0301	1.78±0.32 (122.85)	2.73±0.25 (64.84),
Outside	31.03±1.30 (22.56)	25.86±1.10 (23.00)	0.0769	1.14±0.08 (31.37)	2.41±0.34 (75.52)
Ethnic Groups :					
Pathan	27.90±1.00 (24.73)	22.46±1.70 (52.38)	0.0658	1.76±0.30 (105.14)	3.19±0.35 (72.02)
Baloch	28.65±1.27 (25.82)	22.56±0.83 (21.39)	0.0789	1.86±0.22 (7.28)	2.07±0.28 (75.10)
Jats	28.04±0.68 (16.20)	23.71±0.65 (18.33)	0.1877*	1.29±0.12 (49.80)	2.73±0.33 (80.40)
Araeen	28.05±0.73 (16.80)	23.83±0.70 (19.15)	0.2481*	1.86±0.47 (132.11)	2.52±0.28 (72.82)
Origins :					
Urban	28.23±0.56 (20.01)	23.59±0.48 (20.85)	0.2196*	1.81±0.26 (109.91)	2.59±0.21 (81.26)
Rural	27.25±0.60 (22.17)	22.07±0.85 (38.68)	0.0656	1.47± 0.13 (84.74)	2.84±0.21 (74.71)
Economic Status :					
Poor	25.33±0.75 (19.83)	21.40±1.74 (54.41)	0.0150	1.72±0.27 (101.10)	3.18±0.35 (72.77)
Medium	27.68±0.54 (20.42)	22.72±0.47 (21.68)	0.1817	1.59±0.17 (100.70)	2.55±0.19 (77.02)
Rich	30.21±0.93 (21.10)	24.74±0.67 (18.45)	0.1776	1.31±0.24 (65.37)	2.60±0.31 (77.30)
Total	27.49± 0.49 (25.75)	21.85±0.49 (32.78)		1.60± 0.13 (11.00)	2.54±0.15 (88.52)

basic settlers of Punjab. The other two ethnic groups, which bear a comparatively low incidence of cousin marriages, are settlers of southern Punjab similarity Pakistan (Balochs) or northern Balochistar and NWFP (Pathans). Our results suggest that generally the major part of the marriages occur between first cousins or subcaste/caste. Such a pattern is also in agree-

ment with the one suggested by Shami and his coworkers for different populations of Punjab.

A gradually rising incidence of prenatal deaths with degree of consanguinity can be directly attributed to the appearance of homozygosity at different gene loci and recessive lethal effect of such abnormalities, finally causing abortions and still births. Such an effect has been reported in the population of Jhelum (Shami and Minhas, 1984) for abortions and in the populations of Rawalpindi city (Shami and Siddiqui, 1984), Lahore (Shami and Zahida, 1982), Sheikhupura (Shami and Iqbal, 1983), Jhelum (Shami and Minhas, *loc cit*) and others (Sutter and Tabah, 1954; Chakraborthy and Chakravarti, 1977) for still birth. The postnatal deaths, however, remain uneffected by the degree of consanguinity, suggesting more of the environmental influence upon such deaths. This goes in conformity with the observations of population of Rawalpindi city (Shami and Siddiqui, *loc cit*).

The ages of males and females at the time of marriage in our sample are generally higher than those suggested by the studies of Shami and his coworkers in the central Punjab, Pakistan, attributable to the socio-cultural difference. The presence of significant correlation with regard to age at marriage suggest that due consideration is given to the age in selection of the marriage partner, which is generally arranged by the parents. An insignificant differences in this parameter between different ethnic groups, type of the marriage and origin of the family generally suggest a homogeneity in the genetic background and social patterns of the area. A gradual increase in the age at marriage and a decrease in the time taken for the first pregnancy and children per couple with the rising economic status is explainable on the increasing degree of education and better nutrition conditions. No data is in hand on this and/or adjacent populations with regards to these parameters.

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