Summary

The causation of a wide range of diseases and anomalies can be attributed - wholly or in part - to consanguineous marriages in the parents of the affected offspring. Consanguineous marriages are common in the Middle East and the Asian subcontinent. In Saudi Arabia, although the socio-economic structure has changed, yet tribal habits of encouragement of consanguineous marriages are still prevalent.

The present study has been conducted to detect the magnitude of inbreeding and related health consequences. A total of 1248 Saudi individuals were included in the present study which had been conducted in the catchment areas of five primary health care centres randomly selected in Riyadh - Saudi Arabia during the period from January 1991 to the end of June 1992.

The study included 653 (52.3%) females and 595 (47.7%) males.

The majority of respondents (58.7%) had their origin in the central area of Saudi Arabia which includes the Capital City of Riyadh.

The average age for the total sample was 34.94 $\pm$ 10.5 years. The age differences between males and females as well as the consanguineous and non-consanguineous marriages were not significant.

Non-consanguineous marriages had a prevalence rate: 55.13%, whereas consanguineous marriages had a prevalence rate of: 44.87%.

Study of the level of education of the investigated sample showed that illiteracy rate was 30.13%. Females were more illiterate than males (38.2%) and 21.3% respectively).

The higher respondents are educated, the lower the probability to be married to a relative. The occupational distribution has shown that the majority (31.33%) were housewives, 30.7% were students, 18.35% labourers and 5.37% were professionals.

96.7% were married individuals.

Classification of respondents according to the year and type of marriage, gave a faint hope that the attitudes towards consanguineous marriages are slowly declining by time.

Classification of consanguineous marriages had shown that 1.7% were double first cousins, 23.6% were first cousins and 19.6% were relatives (less than first cousins).

The estimated average inbreeding coefficient for the investigated sample was 0.0405.

73.17% of respondents who had consanguineous marriages still prefer the same type of marriage, whereas 26.83% disfavoured consanguineous marriages.

27.72% of respondents who had non-consanguineous marriages preferred to be married to a related spouse. The most frequently mentioned reason (40.9%) for the preference of consanguineous marriages was that the related spouse was "more tolerant and more patient".

The most frequently mentioned reason (58.1%) for the non-preference of consanguineous marriages was that there were "greater chances of malformations".

Almost one third (33.7%) of respondents stated that they would encourage their children to get married to a relative. On the other hand, those who would discourage their children to be married to a relative constituted 25.6% of respondents.

Those who would not interfere in their children's choice constituted 37.3%.

55.7% of respondents believed that consanguineous marriages will increase the rate of appearance of inherited disorders in their offsprings.

71.7% of respondents declared the fact that public health education concerning health hazards of consanguineous marriages was almost negligible.

However, 46.9% indicated the importance of premarital counseling in prevention of inherited disorders. Out of those, 65.3% had non-consanguineous marriages.

53% admitted that Islam discourages consanguineous marriages and 73.1% of these had non-consanguineous marriages. Respondents who had University or high education had more belief in the concept that Islam discourages consanguineous marriages.

Study of the reproductive aspects of the females in the sample has shown that the average number of pregnancies per woman for consanguineous couples was 5.95 ± 1.2, in comparison to non-consanguineous couples who had an average of 6.25 ± 1.6 offsprings. The difference was statistically insignificant.

The average birth weights of the last baby of the consanguineous couples was 3080 ± 517 grams, whereas the same average for non-consanguineous couples was 3158 ± 508 grams. The difference was statistically insignificant.

Study of the effect of consanguinity on the reproductive wastage, had shown that rate of abortions in consanguineous marriages was 16.49% in contract to 8.31% from non-consanguineous couples.

Stillbirth rate for consanguineous couples was 3.74% contrasted to 1.11% for non-consanguineous couples.

The total prenatal losses was 19.65% in consanguineous marriages and only 9% in non-consanguineous marriages. The relative risk was 2.11% whereas the attributable risk was 10.65%.

The neo-natal death rate for consanguineous marriages was 16.95% compared to 10.68% for non-consanguineous marriages.

The total reproductive wastage rate for non-consanguineous marriages was 33.42% in contrast to 19% for non-related marriages.

In the consanguineous group sickle cell disease had a rate of 6 per thousand, whereas in the non-consanguineous group the rate was only one per thousand. Congenital heart disease was detected in 3.7 per thousand in the consanguineous group and only one per thousand in the non-consanguineous group. Foot deformities were the most prominent in both types of marriages (7.4 and 3 per thousand in consanguineous and non-consanguineous groups respectively).

The total congenital deformity rate in consanguoneous group highly exceeded the rate in the non-consanguineous group (24.4 and 8 per thousand respectively).

Two disorders which have genetical associations were included. These were Insulin dependent diabetes mellitus (IDDM) and essential hypertension.

The total disorder rate for both conditions in consanguineous offsprings was 56.2 per thousand, whereas in non-consanguineous offsprings the rate was 36.2 per thousand.

For IDDM, in consanguineous marriages the rate was 22 per thousand contrasted to 14 per thousand in non-consanguineous offsprings.

For essential hypertension, consanguineous offsprings had a rate of 34.2 per thousand contrasted to 22 per thousand for non-consanguineous offsprings. The results for congenital deformations and genetically - associated disorders should not be generalized due to difficulties of coverage and follow up of cases. The rates which were calculated in the present study were compared to rates in other relevant studies locally, in the Arab area and internationally. Explanations and assumptions for reasons of concordance or disconcordance of rates were supplied for various items including procedural, socio-economic, ethnic, religious and other predisposing factors.

Generally, the study has indicated that marriages of related spouses may explain the prevalence of certain autosomal recessive disorders in Riyadh. The most significant recommendations for prevention of such disorders included the provision of efficient health education programs which should aim at spread of information about adverse consequencies of consanguineous marriages. Also the importance of premarital counseling and prenatal diagnosis were emphasized.

The legal rights of the unborn-baby to be born normal has been discussed. The complex social and ethical issues were handled in many instances.

The role of primary health care physician, the importance of immunizations against rubella infections, the provision of modern technology for repair of certain defects and the encouragement of future research have been stressed with the aim of reduction of the rate of inbreeding and amelioration of its adverse morbidity and mortality.