International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

# Prevalence of Consanguinity in Muslim Community-A Review

**Shamshad. S**

Department of Zoology, K.V.R. Government College for Women, Kurnool, Andhrapradesh, India

**Abstract:** ***Consanguinity ("blood relation", from the Latin consanguinitas ) is the property of being from the same kinship as another person. In that aspect, consanguinity is the quality of being descended from the same ancestor as another person. Consanguineous marriage is frequent in many populations. In fact, it has been recently estimated that consanguineous couples and their progeny suppose about 10.4 % of the 6.7 billion global population of the world First-cousin marriage and other types of consanguineous unions are frequent in a number of current populations from different parts of the world. Consanguinity is most common among muslim population. Consanguinity rates, coupled by the large family size in some communities, could induce the expression of autosomal recessive diseases, including very rare or new syndromes. The most thoroughly investigated are sickle cell disease, haemoglobinopathies, and enzymopathies (glucose-6-phosphate dehydrogenase deficiency). It is the duty of the public health professionals to ensure accessibility to counseling services and to periodically evaluate the knowledge and awareness of the health consequences of consanguineous marriages on offspring health so as to reduce this kind of marriages. And creating awareness among the people may lessen the chance of consanguinity.***

**Key words:** consanguinity, kinship, autosomal recessive disease, muslims.

## 1. Introduction

Consanguinity refers to the marriage of parents with a recent common ancestor. In humans, consanguineous marriage is frequent in many populations. In fact, it has been recently estimated that consanguineous couples and their progeny suppose about 10.4 % of the 6.7 billion global population of the world [1]. First-cousin marriage and other types of consanguineous unions are frequent in a number of current populations from different parts of the world.

Consanguinity is common in several populations of the world though the consanguinity rates vary from one population to another. Furthermore, there is variability between different tribes, communities, and ethnic groups within the same country. Worldwide, wide variations in the consanguinity rates among various ethnic groups have been reported. In European populations the rates are generally less than 0 5%, while in North Africa and southern and western Asian populations 22 to 55% of all unions are consanguineous. In the majority of the US States cousin marriages are illegal under the statutes passed in the 19th and 20th centuries. The practice of consanguineous marriage, or marriage between close biological relatives, shows significant heterogeneity across the world [2], [3]. While such marriages are legal in the Middle East, Africa, the UK and Australia, they are prohibited by law in China, some parts of Europe, and the United States. Prohibitions also vary by religion. While consanguineous marriages are permitted within Islam, Buddhism and Zoroastrianism, they are forbidden by Christian Orthodox churches and require special permission for members of the Roman Catholic Church. The variations in legislative and religious rules are also reflected in the prevalence of consanguineous marriage across regions. In the western world, consanguineous marriages currently constitute less than 1% of total marriages, but this practice remains widely prevalent in many other places. Estimates range from 30—50% in Middle Eastern countries, 20-40% in North Africa, and 10—20% in South Asia [4], [5], [6], [7], [8], [9].There is also significant variation within countries. The National Family Health Survey 1992- 93 [10] reveals that 16% of marriages are consanguineous in India, but this varies from 6% in the north to 36% in the south [11]. Some new research also suggests that the practice is growing in popularity in Western countries, particularly in migrant communities [8].

## 2. Prevalence of consanguinity:

Consanguineous marriage remains common in many parts of the world and has been reported in various communities such as the Mormons [12], [13]. It is especially common in most of the Middle-Eastern countries where the custom in considered socially acceptable [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25]. The same applies to other Muslim countries and regions such as India [26], Pakistan [27], [28], [29], [30], [31] and Uzbekistan [32]. This practice continued in some of the communities who settled the West such as the Pakistani community in the UK [14], [33], [34].

In the Arab countries, consanguinity has been reported with the highest frequency in Saudi Arabia [24], where it reaches 80% of marriages in certain parts of the Kingdom. From the available data, the consanguinity rate for other countries in the Middle East ranges between 59% among the Iraqis [18], 40% among the Palestinians [21], 44% among the Yemenis in Sanaa [17] 49-58% among the Jordanians [35], [15], [16] and 40-54% in the UAE [36]. In Kuwait [37] high rates of consanguineous marriages within the particular Arab communities but low frequency of intermarriage between them, and also the presence of genetic isolates and semi-isolates in some extended families and Bedouin tribes have been described. Consanguinity is less common in North African Arab countries where it was reported to be 29% in Egypt; [23] however, in another study on the Nubian population in southern Egypt the figures ranged between 41.5-45.5% [19]. The highest rates of such marriages have

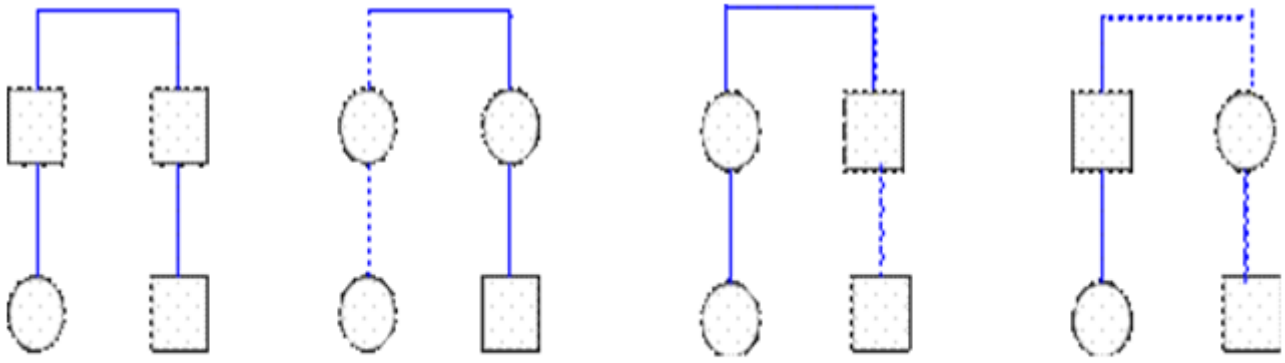

Licensed Under Creative Commons Attribution CC BY

been reported in rural areas, among individuals with low educational levels, and among the poorest. In Morocco [38], with its contact with the outside world, a marked decrease in consanguineous unions is reported; consanguinity is disappearing and does not present a preoccupying problem for public health. However, this cannot be used as a generalization as the trend has increased in younger generations in other Arab countries such as the UAE where the rate of consanguinity has risen from 39% in the parent generations to 50.5% in the current generation [36].

## 3. Sub Types of Consanguineous Marriages

The cultural concepts and the misconceptions about various subtypes of consanguineous marriages are shown in Table1. In some communities particular emphasis is placed upon certain forms of relationship such as type-A of cousin marriage i.e. the children of two brothers, which is the commonest type of cousin marriage, the highest being in Yemen. It is considered as the duty for the male to marry his cousin and an obligation for the female to accept [39]. In Palestine, 20% of marriages were between first cousins [14]. The same pattern was reported in Pakistan where 60% of marriages are between first and second cousins [27]. Type-B is the second most common ie between the children of two sisters and it is believed that such marriages do not constitute a close family marriage as the sisters are from a different family from that of the male cousin. In Jewish society marriage between maternal uncle and niece was also practiced [40]. This practice has parallels with a Chinese regulation whereby marriage between the children of a brother and sister or of two sisters is acceptable as a consequence of the social custom which assigned a woman to the family of her husband and thus regarded children as 'not belonging' to the biological family of the mother. However, the children of two brothers were considered to be of the same family and were therefore prohibited from marrying, despite that their genetic endowment is the same [39]. Similar cultural practices and myth regarding the marriage between the children of a brother and sister or of two sisters exist in Middle Eastern communities, but marriages between the children of two brothers are favored as mentioned above [39]. However, uncle-niece unions are permitted in Judaism. Yet they are forbidden by the *Koran*, even though double first cousin marriages, which have the same coefficient of inbreeding ($F$ = 0.125), are recognized within Islam.

**Table 1:** Sub types of consanguineous marriages




## 4. Consanguinity in muslim population:

In the Arabian populations several studies have shown that consanguinity varies between and within each country with a wide range of prevalence. Reports from Saudi Arabia indicated significant differences. Chaleby and Tuma [41] encountered 18-9% consanguinity in hospital visitors compared to 31.4% in obstetrics inpatients [42]. More recently, in a study of 500 females, the consanguinity rate was shown to be 50% in Riyadh [43]. Reports from the other Arab populations also show a high rate of consanguinity, ranging from 10-6% in Bahrain [44] to 56 4% in Iraq [45], though a more recent report from Bahrain shows a prevalence of 39-4% [23], [46].

Within Saudi Arabia the prevalence of consanguineous marriages differs from one area to another. First cousin marriages occur at the highest prevalence in most of the regions, though in some of the regions second cousin and other marriages between relatives are observed at a high rate. The inbreeding coefficient (F) also placed Saudi Arabia among the countries of the world with a high rate of inbreeding. In western countries where consanguineous mating occurs at a low frequency, the inbreeding coefficient is low, for example in Canada (Roman Catholics) F = 0. 00004-0.0007, in the United States (Roman Catholics) F = 0-0.0008, in Latin America, F = 0-0.003, in southern Europe, F = 0.001-0.002, and in Japan F=0-0.05. However, in populations with higher consanguinity rates the values are higher, for example, in India (Andhra Pradesh) F=0-0.2 and in the Samaritans, a group numbering only around 500 people who have been genetically isolated for over 3000 years, F=0.04 [47]. Saudi Arabia, with a range around 0.02-0.03 and an average of 0.024, occupies an intermediate position.


Licensed Under Creative Commons Attribution CC BY

## 5. Reasons for Consanguinity

There are several underlying factors which may operate to encourage consanguineous marriages. These are socio cultural, economic, cultural and, other factors In Saudi Arabia, the high rate of consanguinity may be attributed to social and traditional factors and to the desire to keep property within families. Similar indications are shown in a neighboring country with similar customs and beliefs. The main factors that inspire consanguinity include social and economic benefits and more stable marriages among cousins, where the male and female grow up in the same or similar environment of the family and therefore adjust more easily after the marriage. In addition, marriage between relatives is considered beneficial as it maintains the family fortunes within the same family structure. Anthropologists have long agreed that the main achievement of consanguineous marriages is the inheritance of family structure and property [48], [49], [50].

## 6. Impact of Consanguinity

Several studies have described aspects of reproductive behavior, reproductive wastage, morbidity and mortality, and genetic effects of consanguineous mating. The major harmful effect of consanguinity is a higher frequency of autosomal recessive diseases in the offspring and frequently an increased rate of morbidity and mortality. The excess mortality is shown to be directly related to the degree of inbreeding [23]. In addition, congenital malformations and inborn errors are believed to occur at a higher prevalence in cousin marriages. In Saudi Arabia, several genetic disorders (mostly autosomal and X linked recessive) are prevalent. The most thoroughly investigated are sickle cell disease, haemoglobinopathies, and enzymopathies (glucose-6-phosphate dehydrogenase deficiency) [51], [52], [53]. People with two or more of these abnormal genes are frequently encountered and interactions between these genes influencing the clinical presentation are common [54], [55]. The number of homozygous cases, for example, sickle cell anaemia and glucose-6-phosphate dehydrogenase (G6PD) deficient females, observed in the different areas of Saudi Arabia is significantly higher compared to the number of expected cases obtained using Hardy-Weinburg equilibrium [56]. This disturbance of Hardy-Weinburg equilibrium is believed to be because of the high rate of consanguinity in the Saudi population. Little information is available on the prevalence of other genetic disorders and congenital anomalies.

## 7. Conclusion

In that case, it is better to require genetic screening before marriage and avoiding of marriages between carriers [57]. It is the duty of the public health professionals to ensure accessibility to counseling services and to periodically evaluate the knowledge and awareness of the health consequences of consanguineous marriages on offspring health. The high consanguinity rates, coupled by the large family size in some communities, could induce the expression of autosomal recessive diseases, including very rare or new syndromes which increase the public awareness of the risks associated with consanguineous marriages. Currently, many young consanguineous couples planning to have children seek preconception genetic counseling for fear of the consequences of consanguinity on their offsprings. The awareness with regard to the hazards of consanguineous marriages was very low (7.6%). Hence steps should be taken to inform people about the problems of marrying close relatives through appropriate programmes. It would also be advisable to avoid consanguineous marriages in families where already a child with an autosomal recessive disorder or congenital anomaly has been born.

## 8. Acknowledgements

I am very much grateful to UGC for funding the project under minor research project scheme MRP-4812/14(SERO/UGC).

## References:

[1] Bittles AH, Black ML. The impact of consanguinity on neonatal and infant health. Early Hum. Dev.2010; 86:737–741. doi: 10.1016/j.earlhumdev.2010.08.003.
[2] Bittles, A.H. (1994). The role and significance of consanguinity as a demographic variable. Population and Development Review 20, 561-584.
[3] Bittles, A. H. and Hussain, R. (2000). An analysis of consanguineous marriage in the Muslim population of India at regional and state levels. Annals of Human Biology 27: 163-171
[4] Kapadia, K.M., 1958. Marriage and Family in India. 2nd Edition. Bombay: Oxford University Press.
[5] Naderi, S.: Congenital abnormalities in newborns of consanguineous and non consanguineous parents. Obstet. Gynaecol., 53: 195 (1979).
[6] Maian A and R Mushtaq (1994), ―Consanguinity in population of Quetta (Pakistan): A preliminary study‖, Journal of Human Ecology 5: 49-53.
[7] Hussain, R., and Bittles, A.H. (1998).The prevalence and demographic characteristics of consanguineous marriages in Pakistan. Journal of Biosocial Science 30, 261-275.
[8] Bittles AH (2001), ―Consanguinity and its relevance to clinical genetics‖, Clinical Genetics, 60: 89-98.
[9] Bittles AH (2008), ―A community genetics perspective on consanguineous Marriage common Genet 11: 324- 330
[10] IIPS, 1995. National Family Health Survey, India 1992- 1993. Bombay, International Institute for population Sciences, 402 P.
[11] Banerjee SK and TK Roy (2002), ―Parental Consanguinity and Offspring Mortality: The Search for Possible Linkage in the Indian Context‖ Asia-Pacific journal 17 (1): 17-38.
[12] World Health Organization. Report of a WHO Advisory Group on Hereditary Diseases. Geneva, 3-5 October 1985. Unpublished WHO document HMG/AG/85.10.
[13] Gilbert RE, Mulaik DD, Stephens FE, Woolf CM. An investigation of the frequency of consanguineous marriages among the Mormons and their relatives the United States. Am J Hum Genet 1956; 8: 236-52.


Licensed Under Creative Commons Attribution CC BY

[14] Zlotogora J, Habiballa H, Odatalla A, Barges S. Changing family structure in a modernizing society: a study of marriage patterns in a single Muslim village in Israel. Am J Human Biol 2002; 14: 680-2.
[15] Khoury SA, Massad D. Consanguineous marriage in Jordan. Am J Med Genet 1992; 43: 769-75.
[16] al-Salem M, Rawashdeh N. Pattern of childhood blindness and partial sight among Jordanians in two generations. J Pediatr Ophthalmol Strabismus 1992; 28: 361-5.
[17] Gunaid AA, Hummad NA, Tamim KA. Consanguineous marriage in the capital city Sana'a, Yemen. J Biosoc Sci 2004; 36: 111-21
[18] Hamamy H, Alwan A. Hereditary disorders in the Eastern Mediterranean Region. Bull World Health Organ 1994; 72: 145-54.
[19] Badr FM. Genetic studies of Egyptian Nubian Populations: I. Frequency and types of consanguineous marriages. Hum Hered 1972; 22: 387-98.
[20] Klat M, Halabi S, Khudr A, Der Katousian VM. Perception of consanguineous marriages and their genetic effects among a sample of couples from Beirut. Am J Med Genet 1986; 25: 299-306.
[21] Freundlich E, Hino N. Consanguineous marriage among rural Arabs in Israel. Isr J Med Sci 1984; 20: 1035-8.
[22] Zlotogora J, Shalev S, Habiballah H, Barjes S. Genetic disorders among Palestinian Arabs: 3. Autosomal recessive disorders in a single village. Am J Med Genet 2000; 92: 343-5.
[23] Hafez M, El-Tahan H, Awadalla M, El-Khayat H, Abdel-Gafar A, Ghoneim M. Consanguineous mating in the Egyptian population. J Med Genet 1983; 20: 58-60 .
[24] el-Hazimi MA, al-Swailem AR, Warsey AS, Sulaimani R, al-Meshari AA. Consanguinity among the Saudi Arabian population. J Med Genet 1955; 32: 623-6.
[25] Sueyoshi S, Ohtsuka R. The effect of polygyny and consanguinity on high fertility in the rural Arab population in South Jordan. J Biosoc Sci 2003; 54: 13-26.
[26] Bittles AH, Hussain R. An analysis of consanguineous marriage in the Muslim population of India at regional and state levels. Ann Hum Biol 2000; 27: 163-71.
[27] Hakim A. Comments on "Consanguineous marriage in Pakistan". Pak Dev Rev 1994; 33: 675-6.
[28] Memon MS. Prevalence and causes of blindness in Pakistan. J Pakistan Med Assoc 1992; 42: 196-8.
[29] Sethi S, Khan MD. Survey of Blind Schools in North West Frontier Province (An Institutional Based Study). Pakistan J Ophthalmol 2001; 17: 90-6.
[30] Afghani T. Causes of Childhood Blindness and Severe Visual Impairment - Survey of the Blind Children from a Rural Population and Schools for the Blind in an Urban Area. Pakistan J Ophthalmol 2000; 16: 4-25.
[31] Butt NH. Childhood Blindness - Aetiological Pattern and Hereditary Factors. Pakistan J Ophthalmol 2002; 18: 92-4.
[32] Rogers NK, Gilbert CE, Foster A, Zahidov BO, McCollum CJ. Childhood blindness in Uzbekistan. Eye 1999; 13: 65-70.
[33] Darr A and Modell B. The frequency of consanguineous marriage amongst British Pakistanis. J Med Genet 1988; 25: 186-90.
[34] Schwarz K, Yeung S, Symons N, Bradbury J. Survey of school children with visual impairment in Bradford. Eye 2002.
[35] al-Salem M, Rawashdeh N. Consanguinity in north Jordan: prevalence and pattern. Biosoc Sci 1993; 25: 553-6.
[36] al-Gazali LI, Bener A, Abdulrazzaq YM, Micallef R, al-Khayat AI, Gaber T. Consanguineous marriages in the United Arab Emirates. J Biosoc Sci 1997; 29: 491-7.
[37] Teebi AS. Autosomal recessive disorders among Arabs: an overview from Kuwait. J Med Genet 1994; 31: 224-33.
[38] Lamdouar Bouazzaoui N. Consanguinity and public health in Morocco. Bull Acad Natl Med 1994; 178: 1013-25.
[39] Stern C. Consanguinity. In: Principles of Human Genetics. Freeman WH & Co. San Francisco, USA. 1973: 368-501.
[40] Foreign & Commonwealth Office. Country Profiles. Middle East and North Africa. http://www.fco.gov.uk/servlet/Front?pagename= OpenMarket/Xcelerate/ShowPage&c=Page&cid =1007029394365&continent=3.(Accessed 23 July 2004)
[41] Chaleby K, Tuma TA. Cousin marriages and schizophrenia in Saudi Arabia. BrJ Psychiatry 1987;150:547-9.
[42] Saedi-Wong S, Al-Frayh RA, Wong NYH. Socioeconomic epidemiology of consanguineous mating in the Saudi Arabian population. J Asian Afr Studies 1989;24:247-51.
[43] Al-Hussein M, Al-Bunyan M. Rate of consanguineous marriages in Saudi population. Symposium on Medical Genetics in the Setting of Middle Eastern Populations, Riyadh, 1993A.
[44] El-Shafei A, Rao PSS, Samdhu AK. Congenital malformations and consanguinity. Aust NZ37Obstet Gynaecol 1986; 26: 168-72.
[45] Hamamy HA, Al-Hakkak ZS. Consanguinity and reproductive health in Iraq. Hum Hered 1989;39:271-5.
[46] Al-Arrayed S. Consanguinity in the State of Bahrain. Symposium on Medical Genetics in the Setting of Middle Eastern Populations, Riyadh, 1993A.
[47] Thompson MW, McInnes RR, Willard HF. Genetics in medicine. 5th ed. London: Saunders, 1991.
[48] Granguist H. Marriage conditions in a Palestinian village. Parts I & III. Helsinki: Soderstrom, 1931.
[49] Resonfeld H. An analysis of marriage and marriage statistics for a muslim and Christian Arab village. Int Arch Ethnogr 1957;68:32.
[50] Schull WJ, Neel JV. The effects of parental consanguinity and inbreeding in Hirado, Japan. V. Summary and interpretation. Am .7 Hum Genet 1972; 24: 425-53.
[51] El-Hazmi MAF. Haemoglobin disorders: a pattern for thalassaemia and haemoglobinopathies in Arabia. Acta Haematol 1982; 68: 43-5 1.


Licensed Under Creative Commons Attribution CC BY

[52] El-Hazmi MAF. Haemoglobinopathies, thalassaemias and enzymopathies in Saudi Arabia: the present status. Acta Haematol 1987; 78:130-4.
[53] El-Hazmi MAF. Haemoglobinopathies, thalassaemias and enzymopathies in Saudi Arabia. Saudi Med 7 1992; 13: 488-99.
[54] El-Hazmi MAF, Warsy AS. On the molecular interactions between thalassaemia and sickle cell gene. Trop Pediatr 1 993; 39: 209-1 3.
[55] El-Hazmi MAF, Warsy AS, Al-Swailem AR, Al-Faleh FZ, Al-Jabbar FA. Genetic compounds-Hb S, thalassaemias and enzymopathies: spectrum of interactions.Trop Pediatr 1994; 40:149-56.
[56] El-Hazmi MAF, Warsy AS. Frequency of sickle cell gene in Saudi Arabia. Hemoglobin (in press).
[57] Raz AE, Atar M, Rodnay M, Shoham-Vardi I, Carmi R. Between acculturation and ambivalence: knowledge of genetics and attitudes towards genetic testing in a consanguineous Bedouin community.Community Genet. 2003;6:88–95. doi: 10.1159/000073004.

## Author Profile

**Dr. S. Shamshad** received the Ph.D degree (zoology) from Osmania University, Hyderabad in 2008 and M.Ed from Dr. B.R. Ambedkar University, Hyderabad in 2011. She had her post graduation (zoology, with molecular biology specialization) from S.V. University in 1995, M.A (English) from Dr B.R.Ambedkar open university in 2004 and B.Ed from IASE, Kurnool in 1995. She is now working as Zoology lecturer at KVR Govt. College for Women, (Kurnool dist), AP, India. She is a member of board of studies and paper setter (Zoology) for Osmania College (autonomous), Kurnool. At present she is doing a minor research project funded by UGC SERO.


Licensed Under Creative Commons Attribution CC BY