

Trends and Prevalence of Consanguineous Marriages in Mudaliars of Palakkad District of the State of Kerala

P. Jyothi Lekshmi and M.V. Sudhakaran*

Department of Botany, Mahatma Gandhi College, Thiruvananthapuram, Kerala, India

**Government Ayurveda College, Thiruvananthapuram, Kerala, India*

KEYWORDS Migrant Community. Pattern of Consanguinity. Inbreeding Coefficient. Socio-economic Correlates. Temporal Trends

ABSTRACT The prevalence, pattern, socio-economic correlates and temporal trends in consanguinity among Mudaliar, a Hindu Backward Community of Palakkad District of Kerala were studied by conducting survey and structured interview on 412 randomly selected families. Consanguineous marriages are found to be 31.6% of all the marriages contracted with a mean coefficient of inbreeding, $F = 0.0235$. First cousin marriages are found to be the predominant type (15.8%), followed by uncle-niece type (6.6%) and second cousin marriages (5.8%). Relationship between consanguinity and region of residence of the couples was found conspicuously higher in rural areas relative to urban areas. The relationship between consanguinity and educational status of women showed a negative association. A consistently declining trend in consanguinity from older to younger generation is not evident among the Mudaliar, which contradicts the general trends prevailing in most populations of the world. It is suggested that propensity to marry a relative has not changed much over time among this immigrant community of Kerala. Their strong belief in following the Dravidian culture and traditions, together with socio-economic and educational backwardness acting hand in hand may be the reason for the high prevalence of consanguinity among them.

INTRODUCTION

Marriage between first degree relatives or close biological relatives is often prohibited in most world populations throughout human history. Consanguineous marriages, often viewed as objectionable, are more widespread in many social groups than commonly perceived. The concern of geneticists is that inbreeding significantly influences the health status of population, since most genetic defects and disorders in humans are due to recessive genes and inbreeding is expected to increase homozygosity of such genes, in turn leading to increased levels of pre-reproductive mortality, morbidity and congenital malformations.

Despite many perceived ill-effects in inbred progeny, consanguineous marriages are encouraged and often considered as the preferential choice in many population groups. The global prevalence of consanguinity varies among different population groups. In the populations

of South America, Southern Europe and Japan, the consanguineous unions account for only 1-5% of all the marriages. In the Middle East, South Asia, Central Asia, North Africa and South Indian populations, consanguineous union accounts for 20% to over 50% (Bittles 1994) of all the marriages contracted. Corry (2002) has reported a relatively high rate (50-60%) of consanguinity among the Pakistani community in Britain. However, in some Middle Eastern countries where high rate of consanguinity was prevalent, a recent decline has been reported (Hamamy et al. 2005), while a rise in the rate of consanguinity has been reported in the United Arab Emirates and Qatar (Al-Gazali et al. 1997; El Mouzan et al. 2008) and little or no change in the rate of consanguineous unions reported in the populations of South India; Pakistan and Iran (Ahamed et al. 1992; Bittles 2002; Bittles and Black 2010). The South Indian states in general strongly favor consanguinity and its prevalence varies from 52% in population of Tamil Nadu, 37% in Andhra Pradesh and Karnataka (Banerjee and Roy 2002) to 18% in Kerala (Sudhakaran and Vijayavalli 1996, 1997).

The present study aims to assess the frequency, pattern, socio economic correlates and temporal trends of consanguinity among the Mudaliar community of Palghat District of the State of Kerala. No previous consanguinity

Address for correspondence:

M.V. Sudhakaran,
Arrabhi, TC 6/366(2), Ulloor, Prasanth Nagar,
Thiruvananthapuram 695031,
Kerala, India
Telephone: 91-471-2550737(Res.) 2460190(Off.)
Mobile: 9447500125
E-mail: dr.sudhakaranvasu@gmail.com

study has been reported in this socio-economically backward immigrant community of Kerala.

MATERIALS AND METHODS

Mudaliar also known as Kaikolar, is a socio-economically backward Hindu community of the State of Kerala. Their population dispensation in Palakkad district is comparatively meager compared to other Hindu backward communities. Mudaliars are artisan people, inhabiting in groups and their settlement is called 'Pavody', and the practice of related marriages has long been favored and encouraged among them. Mudaliars are traditionally engaged in weaving cloths in a specially adorned room ('thary') of their own houses. According to Valath (2005), Mudaliar was originally a social group of Tamil Nadu. Their predecessors had migrated from Tamil Nadu for commerce and military training, and settled in Palghat District of the state of Kerala.

In this study, a sample of 412 marriages of Mudaliar community was randomly drawn by using a comprehensive questionnaire. Door to door survey method was employed to collect data on reproductive history, degree of relationship between spouses, educational status of the couple, socio-economic status of the family, prevalence, type of consanguinity and temporal trend of consanguinity. The marriage contracted between spouses who are related as second cousin or closer were classified as consanguineous and those marriages contracted beyond second cousin level were classified as non-consanguineous. The pedigree of both members were carefully evaluated before ascertaining the relationship between a pair of spouses. Non-consanguineous couples from the same socio-economic and educational status of the community were taken as control. The questionnaires were hand coded and tabulated. By using a computer the data was analyzed to assess the frequency, pattern of consanguinity, influence of education and urbanization and time trends of consanguinity. The coefficient of inbreeding (F) was calculated by using the method of Wright (1922). Chi-square test was used to test the significance of relations.

RESULTS

A total of 412 marriages were studied, and the results are depicted in Table 1. Of these, 130 (31.6%) marriages were found to be of the consanguineous type with $F = 0.0235$. The most frequently encountered type was first cousin marriages (15.8%), followed by uncle niece (6.6%). Among first cousin marriages, matrilineal cross cousin type was found to be the most preferred choice (8.5%), followed by patrilineal cross type (6.8%). The frequency of second cousin marriages was found to be 5.8 % and first cousin once removed was 3.4%. Matrilineal and patrilineal parallel cousin marriages were also found, albeit in very low frequency.

Region wise analysis of data (Table 1) revealed a high rate of consanguinity in rural (40%) population, intermediate level (30.2%) in suburban area and low rate (22.2%) in urban area (Fig. 1). However, consanguinity related to region of residence was found to be statistically not significant ($\chi^2_{(2)} = 4.492$ $p = 0.106$).

Table 1: Frequency distribution of consanguinity in Mudaliars

Consanguinity type	No.	%
Uncle-niece	27	6.6
Patrilineal parallel	1	0.2
Patrilineal cross	28	6.80
Matrilineal parallel	1	0.20
Matrilineal cross	35	8.50
I Cousin total	65	15.70
1.5 C	14	3.40
2 C	24	5.80
Non-consanguineous	282	68.40
Total	412	100

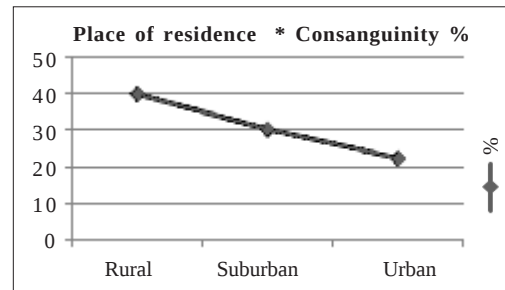


Fig 1. Frequency of consanguinity by region of residence

The influence of education of women was found to have a negative association with consanguinity ($\chi^2_{(3)} = 3.877$; $p = 0.275$) (Fig. 2). However, consanguinity rate was found to be higher among the low educational groups (32.2%) and illiterate women (30.1%) compared to those of high education category of Graduation and above (16.7%).

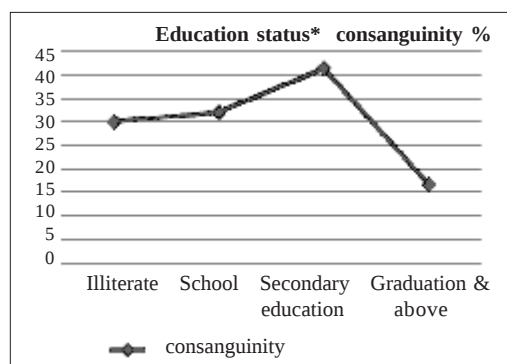


Fig. 2. Frequency of consanguinity by education of women

The temporal trends of consanguinity are presented in Figure 3. The marriages contracted before 1960 showed highest rate of consanguinity (41.7%). The lowest rate (17.9%) was seen during 1960-69. The period from 1970 to 1999 showed a steady increase in rate of consanguinity from 30.4% to 35.4%. An obvious declining trend of 27.7% in the rate of consanguinity was noticed in all marriages contracted after the year 2000. The temporal trends of consanguinity among Mudaliar was not found to be statistically significant ($\chi^2_{(5)} = 4.828$; $p = 0.437$).

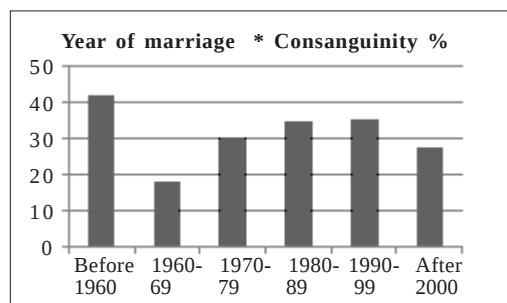


Fig. 3. The temporal trend of consanguinity among Mudaliars

DISCUSSION

In humans mating is not random because of finite population size, close proximity, cultural preferences, languages and socio-economic biases of many sorts, where mating between relatives is a common practice (Solbrig and Solbrig 1979). Many religious, social and ethnic groups around the world are found to prefer relatives as their marital partners. However, degrees of relationship of spouses, the pattern and trends in consanguinity are determined largely by the prevailing social customs and cultural behavior of the mating groups. The widely touted explanation for the persistence of consanguinity is that it provides many socioeconomic benefits to the conjugal partners (Bittles 2002; Denica et al. 2011).

In the present study, consanguineous unions account for 31.6% of all marriages contracted with mean coefficient of inbreeding $F = 0.0235$. The first cousin union is found to be the preferred choice (15.8%), followed by uncle-niece (6.6%). Among the first cousin marriages, matrilineal cross is the predominant type (8.5%) and patrilineal cross is found to be 6.8%. These preferential types are reported to be the common amongst most countries including South India (Bittles 1994; Banerjee and Roy 1996) and Kerala (Pillai and Mathew 1995; Sudhakaran and Vijayavalli 1997; 1998), whereas in the Middle East countries and Muslim population in general, patrilineal parallel unions are predominant choice, as it is a part of the Arab culture (Khlat and Khudr 1984). Mathew et al. (2006) have reported that in Kerala, irrespective of social class, all Hindu castes and communities generally favor matrilineal cross cousin marriages. In Kerala, uncle-niece marriages were restricted to scheduled castes and tribal groups, albeit in very low frequencies. The present study shows that uncle-niece marriage is one of the preferred choices among Mudliar. This may be due to the Mudliars still following the Dravidian culture and traditions of the Hindu communities of Tamil Nadu, wherein uncle-niece marriage is considered as a preferential choice for mate selection. The men in Mudliar community are often engaged in their traditional weaving works. They require the help and assistance of their wives in starching threads, drying them, attaching it on *tharies*. Thus a man prefers to choose a close relative as his partner, as she is familiar and well versed in traditional work.

The studies reviewing the rate of consanguinity among the populations of South India show that the rate varies throughout the region, ranging from 20% to 60% with $F = 0.0267$ to 0.0493 (Rao and Inbaraj 1977; Reddy and Rao 1978; Reddy and Malhotra 1991; Reddy 1992; Bhasin and Nag 1994; Bittles 1998; Sudhakaran and Vijayavalli 1998). The relationship between consanguinity and region of residence shows that the incidence of consanguinity is lower (Fig.1) in urban areas relative to that of rural area. This is a general trend consistently reported from other parts of the country (Centerwall and Centerwall 1966; Bittles 1994), including Kerala (Kumar et al. 1967; Sudhakaran and Vijayavalli 1996; Mathew et al. 2006). A consistently declining trend in consanguinity from older to younger generation is not evident in the present study of Mudaliars (Fig.3) and this contradicts the general trends prevailing in most areas of the world, where remarkable decline in the rate of inbreeding has been reported from older to younger generations (Sanghvi 1966; Prothro and Diab 1974; Khlal and Khudr 1984; Bittles 1994; Richard and Rao 1994). The present study suggests that the propensity to marry a relative has not changed much over time (Fig. 3) among this immigrant community of Kerala. Their strong belief in following Dravidian culture and traditional weaving works, together with socio-economic and educational backwardness acting hand in hand may be the reason for the high prevalence of consanguinity among them.

ACKNOWLEDGEMENTS

The first author is thankful to The Principal, Mahatma Gandhi College, Thiruvananthapuram and Prof. Parvathy Menon, Head of the Department of Botany, for providing facilities and encouragements for carrying out this work. The first author is also grateful to UGC, for the providing Financial Assistance under FIP XI Plan, which enabled to complete this scientific endeavor.

REFERENCES

- Ahmed T, Ali SM, Aliaga A, Arnold F, Ayub M, Bhatti MH 1992. *Pakistan Demographic and Health Survey, 1990/91*. Islamabad and Columbia, MD: Pakistan National Institute of Population Studies and Macro International.
- Al-Gazali LI, Bener A, Abdulrazzaq YM, Micallef R, Al-khayat AI 1997. Consanguineous marriages in United Arab Emirates. *J Biosoc Sci*, 29: 491-497.
- Banerjee SK, Roy TK 2002. Parental consanguinity and offspring mortality: The search for possible linkage in the Indian context. *Asia-Pacific Population Journal*, 17(1): 17-38.
- Bhasin MK, Nag S 1994. Incidence of consanguinity and its effects on fertility and morbidity in Indian region: A reappraisal. *J Hum Ecol*, 3 (Spl.Issue) 161-263.
- Bittles AH 1994. The role and significance of consanguinity as a demographic variable. *Popu Dev Rev*, 20(3): 561-584.
- Bittles AH 2002. Endogamy, consanguinity and community genetics. *J Gene*, 81(3): 91-98.
- Bittles AH 1998. Empirical Estimates of Global Prevalence of Consanguineous Marriage in Contemporary Societies. *Working Paper Series, Paper Number 0074*, Morison Institute for Population and Resource Studies, Stanford University.
- Bittles AH, Black ML 2010. Consanguinity, human evolution, and complex diseases. *PNAS*, 107(1): 1779-1786.
- Centerwall WR, Centerwall SA 1966. Consanguinity and congenital anomalies in South India: A pilot study. *Ind J Med Res*, 54: 1160-1167.
- Corry PC 2002. Intellectual disability and cerebral palsy in a UK community. *Commun Gene*, 5: 201-204.
- Denica S, Nagelkerkeb N, Agarwalc MM 2011. On some novel aspects of consanguineous marriages. *Public Health Genomics*, 14: 162-168.
- El-Mouzan MI, Al-Salloum AA, Al-Herbish AS, Qurachi MM, Al-Omar AA 2008. Consanguinity and major genetic disorders in Saudi children: A community-based cross-sectional study. *Ann Saudi Med*, 28(3): 169-173.
- Hamamy H, Jamhawi L, Al-Darawsheh J, Ajlouni K 2005. Consanguineous marriages in Jordan: Why is the rate changing with time. *Clin Genet*, 67: 511-516.
- Kumar SK, Pai RA, Swaminathan MS 1967. Consanguineous marriages and the genetic load due to lethal genes in Kerala. *Ann Hum Genet*, 52: 141-145.
- Khlal M, Khudr A 1984. Cousin marriages in Beirut, Lebanon: Is the pattern changing? *J Biosoc Sci*, 16: 369-373.
- Mathew PM, Vijayavalli B, Devipriya V 2006. Consanguinity and its effects with special reference to inbreeding communities in Kerala. *J Cytl Genet*, 7: 185-195.
- Pillai PG, Mathew PM 1995. Frequency and genetic effects of consanguinity in the Nayers of Trivandrum District, South India. *J Cytl Genet*, 30: 157-161.
- Prothro ET, Diab LN 1974. *Changing Family Patterns in the Arab East, Beirut, Lebanon*. Beirut: American University of Beirut.
- Rao PSS, Inbaraj SG 1977. Inbreeding effects of human reproduction in Tamil Nadu of South India. *Ann Hum Genet*, 41: 87-98.
- Reddy BM 1992. Inbreeding effects on reproductive outcome: A study based on a large sample from the endogamous Vadde of Kolleru Lake, Andhra Pradesh, India. *Hum Biol*, 64: 659-682.

- Reddy BM, Malhotra KC 1991. Relationship between birth order of spouses with different degrees of consanguineous relationship. *Hum Biol*, 63: 489-498.
- Reddy VR, Rao AP 1978. Inbreeding effects in a coastal village and other parts of Andhra Pradesh. *Acta Genet Med Gem*, 27: 89-93.
- Richard J, Rao PSS 1994. Changes in consanguinity and age at marriage. *Demography India*, 23: 15-28.
- Sanghvi LD 1966. Inbreeding in India. *Eugen Quart*, 13: 291-301.
- Solbrig OT, Solbrig DJ 1979. *Introduction to Population Biology and Evolution*. Philippines: Wesley.
- Sudhakaran MV, Vijayavalli B 1996. Effects of inbreeding on mortality in Ezhavas of Alappuzha South India. *J Cytl Genet*, 31: 179-183.
- Sudhakaran MV, Vijayavalli B 1997. The public health impact of inbreeding on mortality: A community based study. *Health and Population-Perspectives and Issues*, 20 (2): 66-72.
- Sudhakaran MV, Vijayavalli B 1998. Genetic impact of consanguineous marriages on morbidity among the Muslims of Alappuzha Kerala. *J Hum Ecol*, 9: 245-248.
- Valath VVK 2005. *Keralathile Sthalacharithrangal Palakkad Jilla*. Thrissur: Kerala Sahithya Academy.
- Wright S 1922. Coefficient of inbreeding and relationship. *Am Natur*, 56: 330-338.