INBREEDING AMONG INDIAN MUSLIMS: A CASE STUDY OF GARIA OF ASSAM, INDIA

ABSTRACT: Data on consanguinity were collected with the help of extended genealogies traced up to three generations from 1930 matings among Garia, one of the Muslim groups, living in the Barpeta police station, Barpeta district, Assam, India. The data revealed that out of 1930 matings there are 123 consanguineous marriages, representing a frequency of 6.37 percent of consanguinity within this group. The inbreeding coefficient based on consanguineous matings is 0.0064 ± 0.001. The data related to reproductive performance of 1930 mothers who have completed their reproductive span, exhibit a decline in number of pregnancies among consanguineous matings (4.89 per mother when compared with non-consanguineous matings where it is 5.40 per mother). Similarly live borns per mother are lesser in number among consanguineous matings as compared to the control group derived from the same population living in the same area. Pre-reproductive deaths among live births were found to be high (0.46 percent) among consanguineous Garia Muslims. The present findings indicate increased risk of death to live borns from unions of consanguineous spouses.

KEYWORDS: Assam — Maria — consanguineous — genealogies — frequency — mortality — inbreeding coefficient.

INTRODUCTION

The Assam state lies in the north east of India and is characterized by the presence of tribes, castes and religious minorities. Maria is one of the Muslim groups living in this state since time immemorial. Assamese Muslims — a collective term used for Muslims, which is not a single homogeneous entity but rather a conglomerate of several identifiable, distinctive historical communities which are divided into several historical economic, political and social communities, evolved at different stages of historical development of the state. The word Maria is derived from the Assamese word “mara” (beating). The main occupation of this community had been the making of brass metal utensils by constant beating to bring the vessel or utensil to shape. Thus the word “mara” was transformed into Maria to refer to this occupational group. According to knowledgeable sources this group is derived from invading soldiers who had come to Assam in 1532 A.D. under the leadership of Turbak. The latter was defeated by then the Ahom rulers and the accompanying soldiers were made prisoners. Later these soldiers were allowed to pursue their profession within the state and the Maria adopted the profession of making brass metal utensils. At present they are the single largest manufacturers of brass utensils in Assam.

One of the most pronounced cultural traits of Muslims of India, is marriage between cousins. Similarly, the majority of tribes of north-eastern India practice consanguineous marriages. Studies of mar-
riages between close relatives or consanguineous mar-
riages offer the most interesting material for research in
human genetics. A consanguineous mate is be-
tween two individuals who have one or more common
ancestors. The probability of spouses having the same
genets is considerably increased in close inbreeding. It
has been established that inbreeding tends to bring
into the open recessive alleles present in heterozygous
carriers. Many harmful traits are recessive and are,
therefore, most likely to appear in the offspring of
parents who are closely related. Similarly increased risk
of homozygosity for such deleterious recessive mutations
that occur among the offspring of consan-
guineous marriages may result in an increased prob-
ability of abortion miscarriages, stillbirths and neonat-
al deaths. Increased risk of illness, susceptibility to
diseases, physical and mental defects are usually di-
rectly correlated to various degrees of consanguinity.
In general, Muslim groups in India are charac-
terized by the preference of consanguineous marriages as a
prescribed and practised form. High frequency of
inbreeding has been reported among Asna Ashariya,
Shikhi Sunna, Dawoodi Bohra (Rizvi and Roy 1965,
Roy 1966), Muslims of Delhi (Bass 1982) and Mus-
ils of West Bengal (Huq 1976). No serious attempt
has been made to study consanguinity among groups
living in north-eastern India except for a study of the
Hmar tribe of Manipur (Rizvi 1988). Therefore a re-
search design has been prepared to study consanguin-
ity among Muslims of Assam, Meghalaya and Mani-
pur where a substantial percentage of this inbred
population reside. This preliminary report is based on
data collected among Garia Muslims of Assam.

MATERIAL AND METHOD

Data on consanguinity were collected with the
help of extended genealogies traced up to three gen-
erations from 1930 matings among Garia living in the
Baniyakachi area of Darrapeta district, Assam, India.
Only those consanguineous matings were considered
for analysis which were checked and validated by
holding intensive discussion with the members having
knowledge of intricate kinship, relationship and pla-
ces of spouses in the genealogies. Reproductive life
cycles of 1930 mothers who had completed their
reproductive span, were also recorded. This was done
with the aim to find the effects of consanguinity on
fertility and mortality including foetal wastage and perinatal
deaths. The lacuna in available studies on the
effects of inbreeding exists in India since such
studies have been generally carried out on the hospital
samples, which is not the standardised procedure.
Therefore, such studies have thrown up contra-
dictory results for various reasons. It has been sug-
gested that for evaluation of such effects in inbreed-
ing, a suitable control, preferably from the same
gene pool and similar socio-economic stratum, should
be delineated.

RESULTS AND DISCUSSION

The results of the analysis of genealogies are
illustrated in Table 1. It is evident from the table that
out of 1930 marriages there are 123 consanguineous
matings thus bringing out the frequency of consanguin-
ity at the level of 6.37 percent.

<table>
<thead>
<tr>
<th>Type of marriage</th>
<th>Absolute No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>First cousin</td>
<td>21</td>
<td>1.09</td>
</tr>
<tr>
<td>Second cousin</td>
<td>64</td>
<td>3.32</td>
</tr>
<tr>
<td>One and half cousin</td>
<td>38</td>
<td>1.97</td>
</tr>
<tr>
<td>Total No. of consanguineous marriages</td>
<td>123</td>
<td>6.37</td>
</tr>
<tr>
<td>Total No. of non consanguineous marriages</td>
<td>1807</td>
<td>93.63</td>
</tr>
</tbody>
</table>

Inbreeding Coefficient (FA) : 0.064

The data were further stratified to delineate the
degree of consanguinity and comparison with findings
on other Muslim groups. It was assessed that out of
123 consanguineous marriages the majority of were
of second cousinship followed by one and half
cousinship (1.97 percent) and first cousin (1.09 per-
cent). Thus the Garia Muslim differ from other
Muslim groups as far as preferential and practised
consanguinity is concerned.

The mean inbreeding coefficient for the auto-
somal trait (FA) has been defined as

\[
\frac{N}{N(N-1)} \sum_{i=1}^{N} \frac{n_{i} - n_{i} - n_{i}}{N(N-1)}
\]

where \( n_{i} \) is the total number of marriages, \( n \) is the frequency of
each type of consanguineous marriages and \( \bar{f} \) is the in-
breeding coefficient for the autosomal trait, that is the
probability that two autosomal alleles in the off-
spring are identical by descent from one common
ancestor. The inbreeding coefficient based on con-
sanguineous matings worked out to be 0.0064 ± 0.001
among Garia Muslims.

On reviewing consanguinity data in India we have
found that there exist lacunae of information on con-
sanguinity in north-eastern India. The coefficient of
inbreeding is found to be the highest in Assam, Pradesh ranging
from 0.013 to 0.033, depending upon
the social or religious communities studied so far. The
coefficient of inbreeding among Hindu in Tamilnadu
is as high as that found in Assam. The rates of consan-
ginity were observed to be low among Desiash and Saraswati Brahmins of Maharashtra, with the coefficient of inbreeding ranging from 0.001 to 0.003 (Sanghi 1966). However, among Muslims consanguineous rates were found to be high in Meemous (27.1 percent), Bohra (126 percent) and Khosha (13 percent).

In Rajasthan Bhatta and Bhatia (1974 C.R. Rizvi
and Roy 1964) found the coefficient of inbreed-
ing among Bhatia of Garhi Dhanauta to be 0.025. In
Madhya Pradesh Gowsami (1970) has found that the
rate of consanguineous marriages was high among Muslims (59.3 percent), low among Hindu (8.7 per-
cent) and intermediate among Scheduled castes, Harijans and Christians (25 percent to 28.6 percent). The inbreeding coefficient varied from 0.003 to 0.026. The highest incidence (59 percent) of first cousin marriages was reported by Yadav (1968) in the Garhi tribe of Chhindwara district of Madhya Pradesh.

The data related to reproductive performance of 1930 mothers who have completed their reproductive life cycle have been illustrated in Table 2.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Average</th>
<th>Absolute No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consanguineous matings</td>
<td>591</td>
<td>4.80</td>
<td>9758</td>
</tr>
<tr>
<td>Non-consanguineous matings</td>
<td>119</td>
<td>0.97</td>
<td>241</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>472</td>
<td>3.83</td>
<td>9517</td>
</tr>
<tr>
<td>Miscarriage</td>
<td>57</td>
<td>0.46</td>
<td>193</td>
</tr>
<tr>
<td>stillbirths</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Infant deaths</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
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<td>Infant deaths</td>
<td>0</td>
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<td>Infant deaths</td>
<td>0</td>
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</tbody>
</table>

From the above data we have found a decline in number of pregnancies among consanguineous
matings (4.80 percent) when compared with non-
consanguineous matings (5.40 percent). Similarly live
births per mother are less (3.83 percent) among con-
sanguineous matings as compared to the control
group (5.27 percent) derived from the same popula-
tion. Pre-reproductive deaths among live-born infants
were found to be high (0.46 percent) in consanguini-
neous matings.

The above findings indicate an increased risk of death to live-born children from consanguine-
ous unions. Our knowledge of the effects of inbreeding on fertility, mortality and morbidity is woefully in-
adequate. Moreover, some of the studies conducted on hospital patients in different parts of the country have
shown often contradictory results since neither a suit-
able control is maintained nor the history of inbreed-
ing is systematically studied while evaluating its effect
on fertility, mortality and morbidity. Further, empha-
sis has not been given to socio-economic accompa-
tants which may also have a bearing upon this pheno-
menon.

Such contradictory findings have drawn atten-
tion towards the need of a carefully designed survey of
inbred groups to study the effects of inbreeding not
only to collect data with the help of standardised tech-
niques but also to affirm the genetic load that such
populations carry from generation to generation.
Such information may provide guidelines in determi-
ning the nature and extent of health programme for
these inbred groups.

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