ABSTRACT

The word, consanguinity is taken from two Latin words “con” meaning common or of the same and “sanguineus” meaning blood; hence referring to a union between individuals of same blood. The main reported consequence of these consanguineous marriages is the higher risk of transfer of autosomal recessive disorders from one generation to the next, as it is difficult to find a partner who carries the same disorder unless they are related.

Hence, consanguinity in a way is responsible for alteration of genotypic frequencies; and supposedly influences the structure and formation of a population. Literature is available since ages on the association of medical conditions like blood dyscariasis, mental conditions etc with consanguinity; however the literature is almost silent on the association of non syndromic dental conditions with consanguinity. Therefore, this issue becomes very important and that is why the present study was planned.

The present community based study entitled-

“A Comparative study to assess Oro- Dental Variations and Oral Health Status in children born out of Consanguineous and Non Consanguineous marriages” was conducted in Aligarh city (Municipal Corporation) ;Uttar Pradesh, India, with the following aims and objectives –

1. To assess the various oral and dental developmental defects (non - syndromic supernumerary teeth, cleft lip – palate, fusion, hypoplastic/hypocalcemic defects etc) in children born out of consanguineous and non – consanguineous marriages and its association with their parents.
2. To assess the dental parameters (molar relationship, incisor relationship, spacing, crowding etc.) in children born out of consanguineous and non- consanguineous marriages and its association with their parents.
3. To assess the dental caries status (DMFT/deft index) in children born out of consanguineous and non -consanguineous marriages.
5. To find out the Coefficient of Inbreeding (F) for the study population.

**Null Hypothesis for the present study (H₀)**

There is no difference in the occurrence of dental caries, dental parameters (molar relationship, incisal relationship, spacing, crowding) and dental developmental defects in either of the groups i.e. consanguineous and non – consanguineous group.

A house – hold survey using a cross sectional study design was planned after obtaining the sample size; the researcher conducted the study by visiting every tenth house hold of every tenth ward (systematic random sampling) of Aligarh city (U.P), India. The study population included a total of 2000 children aged 6- 9 years and their parents (1600 non consanguineous and 400 consanguineous) living in 1597 households in 7 selected wards of Aligarh city, India.

The study population was bound by the following inclusion and exclusion criteria.

**Inclusion criteria –**

(a) Children aged 6 -9 years.

(b) Permanent resident of Aligarh city, living permanently in Aligarh since birth.

(c) Healthy children.

(d) Both parents alive.

**Exclusion criteria-**

(a) Children living continuously outside Aligarh for a duration exceeding six months ever since their birth.

(b) Non - healthy children.

(c) Premature births.

(d) Children whose mothers were exposed to radiation during pregnancy.
(e) Children whose mothers had taken vaccination against Rubella/Varicella during pregnancy.

(f) Children whose mothers were on long term medication during pregnancy.

(g) All those not willing to participate in the study.

Permission to carry out the study was obtained from the Institutional Ethics and Research Advisory Committee, Faculty of Medicine; Aligarh Muslim University, Aligarh. Informed Consent was obtained from all the parents of the respondents and they were assured of the confidentiality of the information given by them.

The study was conducted by a single examiner. Standardization and validity of the observer was done before the conduct of the study. The mean Kappa value was found to be 0.86. Pilot study was conducted to test and to make necessary corrections in the questionnaire. The overall internal reliability of the questionnaire was 0.74 according to Cronbach’s alpha. The respondents and their parents were interviewed and the data was recorded on a self prepared and now a pre – tested questionnaire.

The first part of the questionnaire dealt with demographic data, second part with medical history and clinical dental examination of the parents. The third part had the details of risk factors associated with dental caries of the respondents (WHO Oral Health Questionnaire for children-5th edition). The fourth and final part was used for clinical – dental examination of the respondents and their DMFT/deft index recording in accordance with the W.H.O criteria for epidemiological studies.

The questionnaires were coded manually. A numeric was assigned to each variable. The data analysis was done by employing SPSS version 16 software- Chi square tests, Fisher’s exact test, mean standard deviation, Students t- test and multivariate logistic regressions were done. p value of <0.05 was considered significant.

For the present research study, there is a possibility of information bias, especially regarding disease reporting, as at times the parents might have misunderstood the question. The study being a household survey, so radiographic examination was not possible. The absence of radiographic evaluation for the dental developmental anomalies and the age
group inclusion criteria for the respondents as 6 – 9 years , may have acted as limitations for the present study in bringing out the actual presence and hence the association of dental anomalies in the study population with either of the groups.

On multivariate logistic regression for the present study, in demographic data – under Religion; Islam and Christianity had a significant association with the consanguineous group, while in Parental occupation; Private employment had a weak though a significant association with the non – consanguineous group.

Pertaining to dental developmental defects – non - syndromic supernumerary teeth, hypoplastic/hypocalcemic defect, molar incisor hypomineralization in fathers; molar incisor hypomineralization, fusion and cleft lip and palate in mothers; non – syndromic supernumerary teeth, congenitally missing/impacted teeth, hypoplastic/hypocalcemic defect, molar incisor hypomineralization, fusion, cleft lip – palate, microdontia and ectopic eruption in respondent had a significant association with consanguinity.

In dental parameters – no spacing in father, mesial step of second deciduous molar relation and Class I incisal relation of the respondent had a significant association with the consanguineous group. Class I and II permanent molar relation of the father and no spacing in the respondent showed a weak but a significant association with the non – consanguineous group.

DMFT score for the present study for non – consanguineous group was 2.02±1.42 and 1.82 ± 0.90 for consanguineous group. The deft score for non – consanguineous group was 3.02 ±2.13 and 4.06 ± 2.32 for consanguineous group. deft score was significantly associated with consanguineous group. In risk factors for dental caries - Demographic factors; Unemployment. Oral hygiene practices; frequency of teeth cleaning– (never, once a week, several times a week, once a day), mode of cleaning – (wooden toothpicks), use of tooth paste and knowledge about fluoride in paste. Feeding practices; frequency of sweets consumption – (every day, milk with sugar–never, several times a month, once a week, every day), tea with sugar – (several times a month, several times a week) and nocturnal bottle feeding with milk had a significant association with dental caries. The coefficient of inbreeding (F) for the present study is 0.0538.
Hence, the formulated **Null Hypothesis** for the present study that there would be no difference in the occurrence of dental caries (DMFT/deft index), dental parameters and dental developmental defects in either of the groups i.e. consanguineous and non-consanguineous group is hereby **rejected**.

Therefore, I can recommend that individual, family and community have to be educated through IEC programmes and awareness created amongst them, regarding the consequences of consanguineous marriages and that not only medical conditions but non-syndromic dental conditions too have an association with consanguinity. Pre-marital and pre-conceptual counselling is a logical way to allow the couples to make decisions and is more likely to be received with greater acceptance rather than discouraging consanguineous marriages.

Health care workers should have clear laid down evidence based guidelines in counselling couples related to the risks of having dental conditions in their offsprings. Collaboration between dental professionals and geneticists is needed to explore the underlying genetic factors by complete family history and to create a pedigree chart highlighting the affected and unaffected member. In this way, the early recognition of dental defects and dental conditions would permit long range planning and would definitely improve the prognosis through timely orthodontic/dental intervention.