

**EFFECT OF CONSANGUINITY(TULYAGOTRIYA VIVAHA) ON CHILD HEALTH: A SURVEY STUDY****Dr. Susanta Kumar Barika¹, Suryanarayana Mudadla², Dr. Radhika Injamuri³**

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<https://doi.org/10.46607/iamj14p7012022>

(Published Online: November 2022)

Open Access

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Article Received: 31/10/2022 - **Peer Reviewed:** 12/12/2022 - **Accepted for Publication:** 27/12/2022

**ABSTRACT**

Consanguineous marriages have been practiced since the early existence of modern humans. Consanguinity is a term that is derived from 2 Latin words "con" which means common and "sanguineous" which means blood, referring to a relationship between 2 biologically related individuals. In clinical genetics, a consanguineous marriage means a union between couples who are related as second cousins or closer. Chances of inheritance of a mutant allele at the same locus are increased as both parents have a common ancestor. Among genetic disorders, Autosomal recessive disorders are strongly associated with consanguinity, approximately 30% of sporadic undiagnosed cases of mental retardation, congenital anomalies, and dysmorphism may have an Autosomal recessive etiology with risks of recurrence in future pregnancies Modern science says that Individuals whose parents are consanguineous are expected to have an increased proportion of their genome that is homozygous.

Key words: Tulyagotriya Vivaha, Atulyagotriya Vivaha, Consanguineous marriage, Autosomal recessive disorder, Homozygosity,

INTRODUCTION

Consanguinity is both a social and genetic concept. Generally, it refers to marriage or a reproductive relationship between two closely related individuals. The offspring of consanguineous couples are at increased risk for autosomal recessive disorders due to their increased risk for homozygosity by descent. The human population has seen modern civilization and is still within family boundaries one such familial social bond is consanguineous marriage because of positive aspects like traditions, respected, and keeping the property in a united form within the family. It is estimated that one billion of the current global population live in communities with a preference for consanguineous marriages collectively accounting for 20-50 +% of all marriages in west Asia, North Africa, Middle east¹. However, in the population of Dravidian Hindus of south India consanguinity is common and the incidence is about 10-37%, among them incidence in Tamilnadu -47%, Maharashtra-10%, and karnataka-31-37%². This marriage system has been reported as an important factor in the appearance of Autosomal recessive diseases^{3,4} like congenital anomalies, Inborn Error of Metabolism, Haemoglobinopathies, Depression, CHD, Infant mortality, morbidity, spontaneous abortion and still births and so also reported and proved beyond doubt that consanguinity plays a significant role in mental health problems and other many disorders hence which may cause a huge burden on the economy of the country and medical fraternity. The chance of there being a significant medical problem in the offspring of a consanguineous couple depends on two additive risks: the background population risk and the additional risk due to consanguinity⁵ Many populations such as Northern African and Middle Eastern countries show a great rate of consanguineous marriage⁶. In most Middle Eastern countries, consanguineous marriage is a socially supported custom⁷ Consanguineous marriage is common in all Indian Muslim communities.⁸The mainly Indo-European speaking Hindu peoples in the northern states avoid marital unions between biological kin, because of a prohibition on consan-

guineous marriage believed to date back to approximately 200 BC^{9,10} By comparison, there is a long tradition of uncle-niece marriage and unions between a man and his maternal uncle's daughter (mother's brother's daughter) in South India.¹¹ According to Clinical Genetics the Consanguineous marriage is categorized into four no degrees. 1st degree Consanguineous is the marriage between Brother and Sister. Mostly this is not occurring in India. the common genetic makeup is 50%. The probability of Expression of Autosomal recessive condition is maximal. 2nd Degree Consanguinity is the marriage with the father's own sister or mothers' own brother with 25% genetic material in common. 3rd Degree Consanguinity is the marriage with the father's sisters' children or the mother's brothers' children. This type of marriage is more common in India. In which 12.5% of genetic material in common. The 4th Degree Consanguinity the marriage between distant relatives. Minimal risk of autosomal recessive diseases amongst a consanguineous couple. The excess risk that an autosomal recessive disorder will be expressed in the progeny of a consanguineous union is inversely proportional to the frequency of the disease allele in the total gene pool.¹² This is borne out in the higher incidence of many genetic and systemic issues among individuals born from consanguineous compared with non-consanguineous marriages. Reported issues include birth defects, genetic diseases, heart and blood diseases, mental disability, hearing problems, asthma, congenital head, and neck malformation, and cleft lip or palate.^{13,14,15} though accepted to have a great impact on general health, the effect of consanguineous marriage on dental development is not fully understood. A clinical study in South India has found that 30% of children with ID were born from parents who had a consanguineous marriage.^{16,17} Congenital heart defect (CHD) is linked to consanguineous marriage.^{18,19} The role of consanguinity in CHD has been studied in many countries, especially in Asian countries, which have more consanguineous marriages^{20,21}.

AIMS & OBJECTIVES OF THE STUDY:

To evaluate the effect of consanguinity in various genetic disorders association with consanguinity.

To evaluate the effect of consanguinity on child health in the Koppal district, Kamataka, India. To identify the common genetic disorders in children born to the consanguineous couple

Materials & methods

The present study was a cross-sectional survey study approved by the Institutional Ethics Committee prior to the beginning of work.

Study design

The Survey method is the cross-sectional Interview survey. The data has been collected by a predesigned consanguineous marriage-related health questionnaire. The genetic disease and the complaints of the children have been noted and various genetic disorders and basic diagnostic criteria charts have also been prepared.

Source of data

A. Literature Sources: All the classical, modern literatures, and contemporary texts including the websites have been reviewed and documented for this study.

B. Sample source:

Visited about 30 villages in and around Koppal district to identify Consanguineous couples then finally got 227 couples who have Consanguineous marriages, were included in the study. In the present study collection of 227 consanguineous couples were interviewed for screening though the minimum sample is mentioned as 200. A consanguineous couple with a child was assessed. Data were collected from various parts of the Koppal district, including the rural and urban areas to minimize the bias.

INCLUSION CRITERIA

227 consanguineous parents were included irrespective of the degree of the consanguinity.

EXCLUSION CRITERIA

1. Nonconsanguineous couples
2. Consanguineous couples without children were excluded

METHOD OF COLLECTION OF DATA

The samples that fulfilled the inclusion and exclu-

sion criteria were selected irrespective of the degree of consanguinity.

Door to door visit was conducted in and around the Koppal district in 30 villages and a few urban areas of Koppal were visited to identify the consanguineous couple until get 227 consanguineous couples then they are included for structured interview for consanguinity related to genetic disorders in their children.

Data collected by the questionnaire method was arranged properly and obtained observations from the collected data were.

STUDY TOOL

The pre-structured questionnaire was prepared to collect all relevant matters related to consanguinity associated, which includes basic information like demography and the second part contained the degree of consanguinity and its associated various genetic disorders were included.

The questionnaire is divided into two parts. The first part contains questions on the general particulars of the subjects and the second part deals with the degree of consanguinity and status of the child and related genetic disorders. The disease includes 23 genetic disorders and another column is added for including any other genetic disorder. The data was collected from the samples from the door-to-door visit to the different villages of Koppal. After the collection of data, the responses were analyzed with suitable methods.

Sample Size

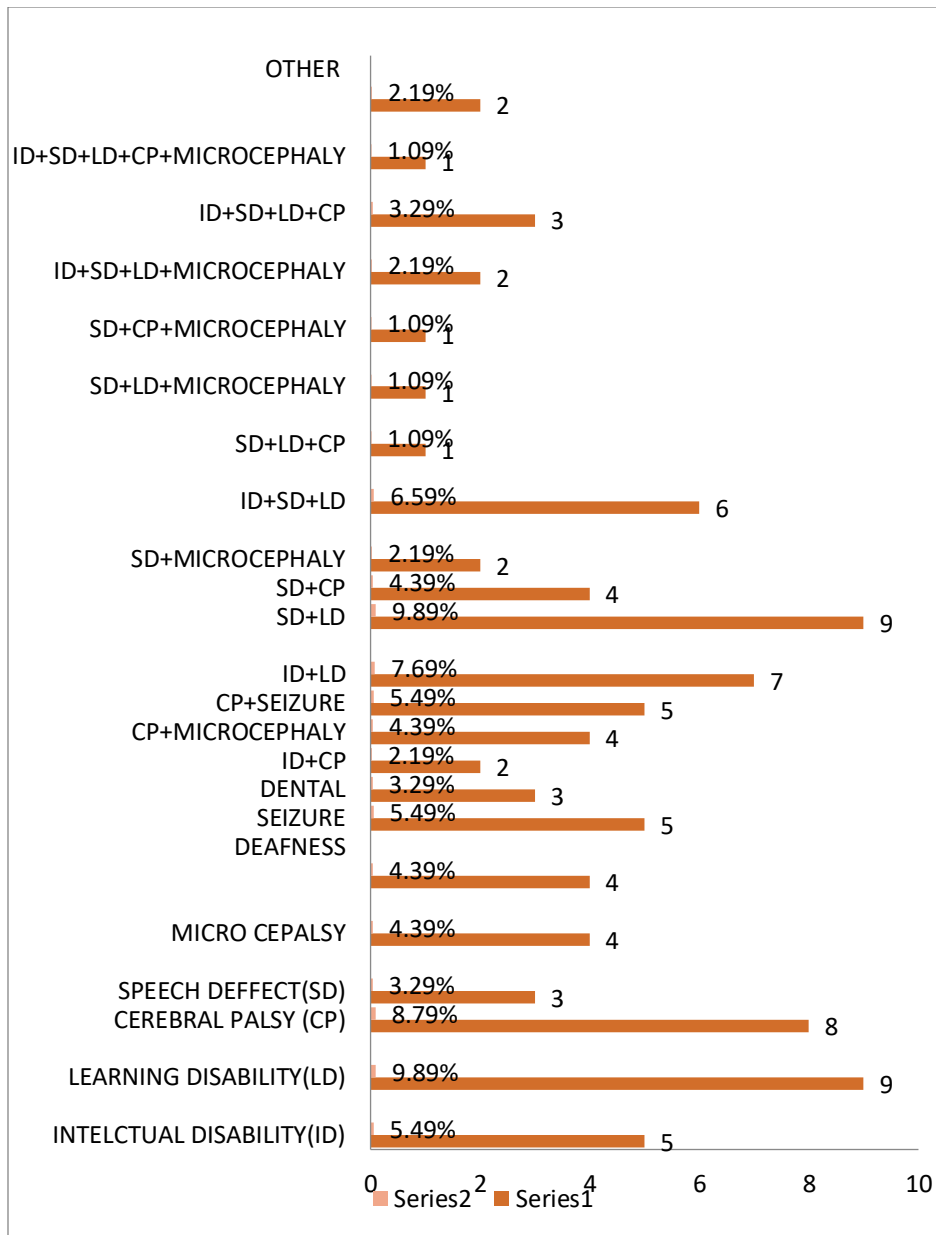
The samples that fulfilled the inclusion and exclusion criteria were selected irrespective of Irrespective of the degree of Consanguinity etc. In the present study collection of 227 consanguineous couples were interviewed for screening though the minimum sample is mentioned as 200. consanguineous couple with a child was assessed.

OBSERVATION AND RESULTS

In this present survey study total, 227 consanguineous couples having children one or more have been included in the study, and this study was conducted in Koppal district Kamataka India. The data was recorded in the predesigned research case. Performa

which has all consanguineous related risks in children. The distribution of children born to 227 consanguineous couples based on their age it has been observed that out of 227 children, 9.25% are below 1 year, 22.90% are 1-5 yr, 27.75% are 6-10yr, 28.63% are 11-15 yr, 11.45% are 16-18yr. The distribution of children born to 227 consanguineous couples based on the Health status of the children it has been observed that out of those 227 children, among them 60% of children were free from consanguinity-related genetic disorders, and the remaining 40% of children were affected with different consanguineous related diseases. The distribution of consanguineous couples based on their Degree of Consanguinity has been observed that among 227 consanguineous parents .60% are 2nd degree, 21% are 3rd degree, 19% are 4th degree, and no 1st degree. The distribution of children born to 227 consanguineous couples based on their religion has been observed that out of 227 children 87% were Hindu, 11% were Musim, and 2% were Christian children. Usually, consanguinity is common in the Muslim community, The distribution is based on the frequency of affected children in relation to the degree of consanguinity, it

has been observed that among 91 affected children, 60.43% of children born from 2nd-degree consanguineous couples, 16.48% are born from 3rd degree, 23.07% are born from a 4th-degree consanguineous couple. The distribution of frequency of affected children based on various diseases has been observed that (ID- Intellectual Disability, LD- Learning Disability, SD-Speech Defect, and CP- Cerebral Palsy,) In this study Total of 91 affected children were detected among them 5% of children were affected with Intellectual Disability, 9% children were affected with Learning disability, 8% children belonged to cerebral palsy, 4% children detected with microcephaly, 4% children were deafness, 5% children were seizure, 3% were detected as a dental issue, 2% were intellectual disability with cerebral palsy, 4% were cerebral palsy with microcephaly, 5% were CP with Seizure, ID with LD 8%, SD with LD 10%, SD with CP 4%, SD With microcephaly 2%, ID along with SD and LD 7%, SD along with LD and CP 1%, SD, LD and microcephaly 1%, SD, CP and microcephaly 1%, ID, SD, LD n Microcephaly 2%, ID, SD, LD, CP with microcephaly were 1%, Other 2%



DISCUSSION

In this study out of the total children, 40% of affected children were detected among them, and 9% of children were affected with a Learning disability. The Learning disability phenomenon is usually considered a family syndrome. Learning is a process that involves word identification and comprehension.

At the first stages of reading acquisition, phonological and orthographic processes are heavily involved. Studies have indicated that the major obstacle in reading among the reading disabled is difficulty in word recognition and also fail in phonological pro-

cessing, which is based on measures of phonological awareness and phonological decoding.

8% of children were belonging to cerebral palsy. In which infants had a congenital malformation of the brain. Although the worldwide prevalence of cerebral palsy has remained stable at 2–2.5 per 1000 live births. The main findings of this study are that crude associations were significant for many known and emerging population-specific risk factors for cerebral palsy.

When adjusted for all variables with the elimination of confounding variables we found that perinatal hy-

poxia, low birth weight, multiple births (twins), no prenatal medical care, other birth defects in the family, and consanguinity remained as significant risk factors.

Along with this most, of the children are associated with multiple diseases. 4% of children were detected with microcephaly, 4% of children were deafness, 5% of children were seizures, 3% were detected as having a dental issue, 2% were intellectual disability with cerebral palsy, 4% were cerebral palsy with microcephaly, 5% were CP with Seizure, ID with LD 8%, SD with LD 10%, SD with CP 4% SD With microcephaly 2%, ID along with SD and LD 7%, SD along with LD and CP 1%, SD, LD and microcephaly 1%, SD, CP and microcephaly 1%, ID, SD, LD n Microcephaly 2%, ID, SD, LD, CP with microcephaly were 1%, Other 2%

Strength of Ayurveda

Ages ago in ayurveda said that Atulyagottra vivaha was only allowed, which was proved now.

In the present study data collected was by direct interview method and with restructured questionnaires to analyse the common genetic disorders and their association with consanguinity.

The sample size was mentioned as 200 but we had 227 subjects for the present study which may give some reliable information.

It was observed that 40% of consanguinity couples had one or other disease related to consanguinity.

Limitations

The finding in the present study was based on medium size sample and confined particular geographical area since may have bias and difficulty to claim generalizability due to its limitations. The present study does not consider the non-consanguineous couple for comparing the prevalence.

As this was a small-scale study, we cannot state any claim to the generalizability of the results, and a study with a larger sample is needed. Concerning bias, the population was a homogenous group with controls representative of cases in terms of the geographical area of residence. This was important to increase representativeness as convenience sampling in one treatment centre was used to recruit cases. Other limi-

tations might be the chance of having undiagnosed cases since we have not employed any diagnostic screening in the parent study

Discussion on observation

The distribution of children born to 227 consanguineous couples based on their age it has been observed that out of 227 children, 9.25% are below 1 year, 22.90% are 1-5 years, 27.75% are 6-10 years, 28.63% are 11-15 years, 11.45% are 16-18 years. Usually, it was difficult to diagnose children below 1 year because of this reason here already diagnosed cases have been included.

The distribution of children born to 227 consanguineous couples based on the Health status of the children it has been observed that out of those 227 children, Among them 60% of children were free from consanguinity-related genetic disorders, and the remaining 40% of children were affected with different consanguineous related diseases Which were supported by previous research works in Karnataka has been proved once again. The distribution of children born to 227 consanguineous couples based on their religion has been observed that out of 227 children 87% were Hindu, 11% were Musim, and 2% were Christian children. Usually, consanguinity is common in the Muslim community but where the study conducted area was Hindu dominated hence these statistical figures have been observed.

CONCLUSION

In the Present study, it was observed that there is a strong association between consanguinity and the health status of the child in the rural and urban areas of Koppal, Karnataka. There is also a need to create public awareness related to the ill effects of consanguinity. Various genetic disorders in children were associated with consanguinity and significantly related to the high rate of prevalence in the Koppal district. In this study Out of the total children, 40% of children were affected with various diseases related to consanguinity and whereas 60% were essentially healthy. The majority of the subjects have a Learning disability, speech-related issues Intellectual disability, and cerebral palsy. Many consanguineous couples

don't have knowledge about the effect of consanguineous marriage on their child which is why perinatal education and counselling are required before going to marriage.

Significance and future actions in research

This research concludes that marriages are predominant in the Koppal district, as previous research suggested reports. Findings revealed that consanguinity is associated with socio-demographic characteristics and children's health. The High prevalence of Consanguineous marriage and its implications on child health is essential to be considered in health policies. Owing to dilute these prevailing socio-cultural practices, a nationwide public education program has to be conducted, engaging key stakeholders and highlighting the risk factor associated with consanguinity to minimize the adverse health outcomes, Further, there is also a dire need to actively engage the public health and child health professionals to promote the health and wellbeing of the pediatric population. Healthcare providers, outreach workers, and social mobilizers may play a critical role in this regard, particularly in identifying the consanguineous couples within their serving community, counseling them and providing information on potential risk factors, and enabling them to make informed choices regarding their child's health.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Susanta Kumar Barika et al: Effect of Consanguinity (Tulyagotriya Vivaha) on Child Health: A Survey Study. *International Ayurvedic Medical Journal* {online} 2022 {cited November 2022} Available from: http://www.iamj.in/posts/images/upload/80_87.pdf