

CONSANGUINEOUS MARRIAGES AND CONGENITAL ANOMALIES†

A Rural-Population — Based on door to door field survey "A Pilot Study"

by

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Thanjavur is a district of Tamil Nadu where consanguineous marriages are the rule in certain interior villages. With a view to find out the impact of close relative's marriages on the incidence of obvious congenital anomalies in the offsprings of rural population, a pilot study was designed. Villages where people always marry close relatives were chosen for the study and a door to door field survey was conducted. The incidence of congenital anomalies in consanguineous marriages was compared with the incidence in non-consanguineous couples.

Methodology

The female medical students belonging to the last two clinical years were trained to carefully fill up a printed proforma and the co-operation of the village head men, V.I.Ps, other voluntary agencies and local P.H.C. doctors. Only female students were utilised because of the fact that then

only the villagers will feel free to answer the questions. To gain the confidence and rapport of the villagers, simultaneous free medical camps were also organised and conducted. Each student was allotted a certain area where she entered into each and every house, interrogated the husband, wife, or husband and wife and carefully filled the proforma. The children were also examined by the students for cardiac lesion etc., when they were available.

Taking the dictionary meaning of the word anomalously, that is, "deviation from the common rule," we have included cases of delayed mile stones, mental retardation, limb anomalies, fusion defects, heart lesions and neural tube defects as congenital anomalies.

The term "Consanguineous" means "of the same blood" or "related by birth" and in this survey, uncle, first cousin and second cousin marriages were taken as consanguineous. The data analysis was done by our college statistician.

Results

Incidence: A total of 8 villages were covered and 3646 couples were interviewed. In this, there were 152 cases of congenital anomalies giving an overall in-

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cidence of 1 out of 24 couples, i.e., 4.1%. Out of the 3646 couples, One thousand, seven hundred and fifty-eight had consanguineous marriages with 87 congenital anomalies i.e., an incidence of 5.12%. In the remaining non-consanguineous group of 1888 couples, congenital anomalies were present in 65 or 3.4%. This is significant statistically (Table I).

The comparative incidence of congenital anomalies in consanguineous as compared to non-consanguineous couples in the 3 religion groups was also observed. (Tables III and IV). The respective figures for the Hindus are 5.4 and 3.6%; Muslims 3.1 and 2.8% and Christians 4.5 and 3%. This shows that marriage among close relatives, definitely has an

TABLE I
Incidence of Congenital Anomalies

Nature of marriages	No. of couples	Congenital anomalies	
		Number	Percent
Consanguineous	1758	87	5
Non-Consanguineous	1888	65	3.4
Total	3646	152	4.1

The influence of religion, degree of consanguinity and parity on the incidence of congenital anomalies was also studied.

Religion

In the study population, there were 2614 Hindus, 613 Muslims, and 419 Christians and the incidence of congenital anomalies in these groups was 4.5%, 2.9% and 3.5%, respectively. The Hindus showed the highest incidence, Muslims lowest and Christians were in between (Table II).

TABLE II
Religion and Congenital Anomalies

Name of the Religion	No. of couples	Congenital Anomalies	
		No.	Percent
Hindus	2614	199	4.5
Muslims	613	18	2.9
Christians	419	15	3.5
Total	3646	152	4.1

TABLE III
Consanguineous Parents and Congenital Anomalies in Each Religion

Name of the Religion	No. of consanguineous marriages	Congenital anomalies	
		No.	Per cent
Hindus	1312	71	5.4
Muslims	291	9	3.1
Christians	155	7	4.5
Total	1758	87	4.9

TABLE IV
Non-consanguineous Parents and Congenital Anomalies

Name of the religion	No. of consanguineous couples	Congenital Anomalies	
		No.	Percent
Hindus	1302	48	3.6
Muslims	322	9	2.8
Christians	1264	8	3.0
Total	1888	65	3.4

adverse effect on the production of congenital anomalies in Hindus and Christians. Though close relatives marriages are nearly as common among the Muslims as the Hindus in the area studied (Hindus 50% and Muslims 47.4), the incidence of congenital anomalies is less in them and the difference between the consanguineous and non-consanguineous groups is not much i.e. 3% and 2.8%.

Regree of Consanguinity

As regards the degree of consanguinity and congenital anomalies, it was as follows—first cousin 5.4%, second cousin 4.3%, uncle 3.9%, distant relation—3.6% unrelated 3.5%. Thus first cousin marriage has the highest incidence of congenital anomalies.

Parity

The influence of parity in relation to consanguineous and non-consanguineous

groups was also analysed and this gave a very interesting finding.

In the study group, there were 2137 women who had 1 or 2 children and 1509 women who had 3 or more. The incidence of congenital anomalies was 2.9% and 5.9% in the 2 groups respectively. The incidence is almost doubled in higher parity groups which is in accordance with the accepted fact that congenital anomalies increase with the increase in parity (Table V). The incidence of congenital anomalies in the non-consanguineous and consanguineous couples in the lesser parity group (i.e. paras I and II) was 2.3 and 3.4% while the same figures for the higher parity group (Para III or above) was 4.8% and 7.3% respectively (Tables VI and VII). In other words, the adverse effect of parity on congenital anomalies is worsened by consanguineous marriages.

The correlation of congenital anomalies

TABLE V
Parity and Congenital Anomalies

Parity	No. of couples	No. of Congenital Anomalies	Percentage of Congenital Anomalies
I & III	2137	62	2.9
III above	1509	90	5.9
Total	3646	152	4.1

TABLE VI
Congenital Anomalies in Non-consanguineous Couples with Relation to Parity

Parity	Number of Non-Consanguineous couples	Number of Congenital Anomalies	Percentage of congenital anomalies
I & II	1063	25	2.3
III above	825	40	4.8
Total	1888	65	3.4

TABLE VII
Congenital Anomalies in Consanguineous Couples with Relation to Parity

Parity	Number of Consanguineous couples	Number of congenital anomalies	Percentage of congenital anomalies
I & II	1074	37	3.4
III above	684	50	7.3
Total	1758	87	4.9

with age was not attempted due to obvious reasons.

Type of Anomalies

Limb anomalies with or without other defects 42%, delayed milestones and mental retardation 33%, and the remaining 25% were constituted by congenital heart disease, neural tube defects and fusion defects.

Comparison with Hospital Cases

To compare the field study with the hospital cases, babies born with congenital defects, and cases of primary amenorrhoeas with absent uterus or absent ovaries were analysed. There were 27 defective babies and 13 in the latter group, making a total of 40 congenital anomalies. In this group, history of consanguineous marriages was present in 63%. When parity was analysed it was found that 70% of these congenital defects had occurred in paras I and II and only 30% were in para III and above.

These data also help to prove that irrespective of parity, consanguineous marriages alone do adversely affect the incidence of congenital anomalies.

Comments

This survey is essentially a rural-population—based pilot study and more elaborate surveys including larger population groups with stricter criteria will definitely

throw more light into the hitherto dark and unexplored areas. But even this pilot study has given us some interesting data.

The overall incidence of congenital anomalies in a rural population in Thanjavur district was 4.1% with 5.1% in consanguineous and 3.4% in non-consanguineous groups. The Hindus had the highest incidence in both groups while Muslims had the lowest incidence and the Christians were in between. The difference between the consanguineous and non-consanguineous groups is visible in Hindus and Christians (i.e. 5.4 and 3.6 and 4.5 and 3% respectively) but in Muslims, not only the incidence of congenital anomalies is low but also there is not much difference in the two groups (3% and 2.8% respectively). One is inclined to ponder whether the difference in the custom in selecting a relative as partner, in Muslims, namely father's brother and two sister's children marrying each other could be a contributory factor for the reduced incidence. More controlled observations on a larger scale may be fruitful in this region.

Usually it may be thought that the closer the relationship, the more the incidence of congenital anomalies and perhaps a common idea that prevails is that uncle marriages may be worse than first or second cousin marriages. But this survey has revealed a higher incidence of 5.4% in first cousin, 4.3 in second cousin compared to

3.9% in uncle marriages. This may be because the abnormal gene may be just transmitted to the offspring without showing any pathological manifestation in the earlier generation.

Due to various social circumstances and unavoidable domestic problems, if one has to marry a close relative, then the couple has to be very prudent and thoughtful and be careful enough to avoid the added risk and ravages of parity over consanguinity by having sterilisation after the first or second child. Such a couple with 2 children run the risk of 3.4% anomalous babies while the risk becomes doubled, to a very high level of 7.3%, if they do not stop with 2, if not one. This is most important thing they should remember for prophylaxis against congenital anomalies, though this number applies to all the eligible couples, from the national

point of view of preventing population explosion.

The possible influence of drug ingestion and fevers during early pregnancy, and difficult deliveries being the cause for congenital anomalies, mental retardation and delayed milestones were ruled out by suitable questions.

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