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AN INVESTIGATION ON ADOLESCENT TWINS: CASE STUDY FROM FAROOK COLLEGE AREA, KOZHIKODE, KERALA.

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ABSTRACT

This study was conducted on a sample of 12 pairs from different institutions of Farook college area. A twin is one of the two offspring produced in the same pregnancy. Both identical and fraternal twins form the sample. A questionnaire, finger prints of twins and aptitude test are used for collection of data. The questionnaire response, aptitude test result, dermatoglyphic angle were analysed. From the analysis it is concluded that the phenotypic similarities are more among identical twins. Both type shares a vast difference in psychological traits. The blood group are the same for both types. Dermatoglyphic angle show only a little variation in identical twins. And fraternal twins show much more variation. There is a difference in IQ and school results in both types.

Keywords: *Adolescence, Twins*

Introduction

A twin is one of two offspring produced in the same pregnancy. Twins can either be monozygotic (identical) that they develop from one zygote that splits and forms two embryos, or dizygotic (fraternal) mean that they develop from two separate eggs that are fertilized by two separate sperms. In contrast, a foetus which develops alone in the womb is called a singleton, and the general term for one offspring of a multiple birth is multiple.

Twins occur in about 1 in 85 human births. Twins come in two types: fraternal or dizygotic (DZ) and identical or monozygotic (MZ). The difference between the two types of twins stems from a difference in how they began life – from the fertilization of two separate eggs (resulting in DZ twins) vs. from the fertilization of a single egg sperms later split in two (resulting in MZ twins). This difference in fertilization results in one type of twins – DZ – sharing an average of 50 % of their genetic material and the other type of twins – MZ – sharing 100% of their genetic material. This difference in amount of shared genetic material sets the stage for a marvellous natural experiment and it is the basis of the twin method for research.

The twin method is used to quantify the magnitude of the contribution of genetic and environmental factors to individual differences in a trait or behaviour. The twin method of research entails the collection of data on both kinds of twin pairs (MZ & DZ).

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Data from MZ pairs can then be statistically compared to the data from DZ pairs in order to assess the relative contribution of genetic and environmental factors to the trait or behaviour of interest. Given that MZ twins share twice the amount of genetic material as DZ twins, then a greater similarity found among MZ twins as compared to DZ twins would be indicative of genetic influence.

However, if DZ twins were as similar on a trait or behaviour as MZ twins, then shared environmental influences (those factors shared by members of a family that make them more alike) would be indicated. Finally, if MZ and DZ twins did not look similar on a trait or behaviour, then non shared environmental influences (those factors that are unique to members of a family which serve to make them different from each other) would be indicated. These types of conclusions can be drawn from twin data if we make some important assumptions. Namely, that MZ and DZ twins have equal environments (ie ; MZ twins are not treated more similarly in the environment than DZ twins) and that twins are representative of the population (ie; there is nothing unusual about twins per se that would make their data on a trait or behaviour markedly different from data from singletons.

Twin studies are utilized in an attempt to determine how much of a particular trait is attributable to either genetics or environmental influence. These studies compare monozygotic and dizygotic twins for medical, genetic, or psychological characteristics to try to isolate genetic influence from epigenetic and environmental influence. Twins that have been separated early in life and raised in separate households are especially sought after. For these studies, which have been used widely in the exploration of human nature. However, the utility and accuracy of these twin studies have been called into question and remains controversial. Classical twin studies are now being supplemented with molecular genetic studies which identify individual genes.

Identical twins share nearly 100% of their genetic polymorphisms, which means that most variation in pairs traits is due to their unique experiences. Fraternal twins share about 50% of their polymorphisms. Fraternal twins are helpful to study because they tend to share many aspects of their environment by virtue of being born in the same time and place. Fraternal twins were near identical in wernicke’s area, showing about 60-70%correlation, but were less similar in other area. Human monozygotic twins and other genetically identical organisms are almost always strickingly similar in appearance yet they are often discordant for important phenotypes including complex diseases. Such variation among organisms with virtually identical chromosomal DNA sequences has largely been attributed to the effects of environment (Hum Mol Genet-2005).

Methodology

A sample of 12 pairs from different institutions of Farook College area (Farook College, Al Farook educational centre, Farook Higher Secondary School, Farook TTI, Farook B.Ed college) form the sample. The study was done during January 2013 to March 2013. The tools used in this study are:

1- Questionnaire, which consists of physiological, psychological and familial question for collecting data. The investigators develop the questionnaire on the basis of twin zygotic questionnaire (Goldsmith H.H, 2001) and observation made on different twins.

2- Dermatoglyphics: The investigators collected the fingerprints of each twin using a stamp pad.

3- Aptitude test: An aptitude test on science (Anuradha joshi and Bhuban chandra mahapatra - RAIS) were conducted for each twin.

Result and Discussions

A total of twelve twin pairs from five different institutions of Farook College area consist of eight (66.66%) identical and four (33.33%) fraternal twins. Out of eight identical twins ,three were boys (37.5%) and remaining were girls (62.5%). In the case of fraternal twins two pairs were girls and one pair was boys and the remaining one pair was a boy and a girl.

Dermatoglyphic angle show only slight difference that is 2-3 degree difference in identical twins. Whereas in fraternal twins it is 3-4 degree. For the aptitude test for both identical and fraternal pairs showed difference in marks. But the difference is due to the subject or course they are studying. But the twins who studies same science related subjects scored almost equal marks. Both identical and fraternal pair who opted same course scored similar marks. The percentages of SSLC marks were almost similar in the case of identical twins but fraternal twins showed clear cut difference.

The age of parents does not have any effect on twin birth. The parents were below 30years when the twins were born and also the twin birth is not hereditary. None of the twin pairs shared hereditary twin birth. Some of the twins were second order, some were first order and some were third order and were the only twin child of the parent. None of them had twin siblings.

The interest and carrier option of both fraternal and identical twins were different. Most of them are interested in different subjects and planning to choose different carrier but only a few of them shared similar interest and career. So the type of twin birth does not have any role in the interest of twins. No one preferred to get married to twins itself, even though 99%of them are proud to be twin.

Most of the twins are attached with themselves than with siblings, and some of them are more attached to parents than other children of the parents and some have competitive mind with themselves. Mostly girl twins are much attached to parents than boys.

The similarity in interest and attitude of twins become less as they have grown older. The blood group of all pairs were same. The phenotypical characters were almost similar in the case of identical twins. No one was club footed and some pairs have fused earlobes while some others have free earlobes. There were no such condition that one of the twin of a pair differ from the other in phenotypical traits such as widows peak, earlobes and type of handedness. The only difference seen is in the case of dimples and skin colour (8.3%). All the other twins remain same in every aspects including hair colour, hair texture, eye brows etc. Height and weight of both types shows difference. Some twins have same diseases that occur frequently and some diseases come together to both the twins disregarding whether identical or fraternal. The psychological characters do not have any connection with the twin birth. It is seen as such in the case of normal individuals. In case of both identical and fraternal the hobbies and interests are different for most of them (85%). Some have similar hobbies. Psychological and behavioural traits are not affected by twin birth. There are many differences and similarities in both identical and fraternal twins. This difference is due to environmental affects.

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