Genetic Study in-need for the development of Primitive Tribes; on the verge of extinction

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ABSTRACT

Health problem is one of the major among the Birhors. The risk is increasing day-by-day with extensive deforestation, frequent climatic calamites, change in traditional economy and other socio-economic factors. The Birhors are a nomadic forest tribe; their life span or life expectancy is significantly low and they are on the verge of extinction. Study found an urgent need of their 'genetic study' to identify various health issues for their holistic development.

The Government should immediately constitute a team for the sero-genetic, demographic as well as haemolytic study of Birhors in a bid to protect them from extinction and to diminish their mortality rates.

Key Words: Genetic Study, Extinct Tribes, Birhor, Health, Development

Introduction

India is an amazing amalgamation of various races and cultures, with a landscape as diverse as its population. Among more than 2,500 people groups in the nation, about 80 percents are considered unreached.

Though, the county has largest concentration of the tribal population in the world. According to 1991 survey census, 67.76 million persons were counted as belonging to scheduled tribes in different States or Union Territories in India constituting 8.08 percent of the total population consisting of 567 different tribal populations.

Government of India has identified 75 tribes across the country as primitive tribes. After independence, central as well as state governments have taken up special programmes for the rehabilitation of primitive tribes having wandering economy in the form of food collection, hunting and shifting cultivation; an utter failure in various means. Among them, Birhor is one of the primitive tribe groups who trace their origin in Jharkhand and reside for ages in different parts of the state. Birhor in Jharkhand belong to the Proto-Australoid stock; linguistically, they originate from the Austro-Asiatic group. Though, their primary populations are found in the states of Jharkhand and Odissa.

Birhor are living in the forests of central and eastern India including Jharkhand (Hazaribagh, Giridih, Ranchi, Lohardaga, Palamu, Garhwa, Dhanbad, and Singhbhum), Chhatisghar, Odisha and West Bengal (more than 150 years ago and finally settled in 3 blocks of Purulia like Baghmundi, Jhalda and Balarampur. At present they are found living in Bareriya and Bhupatipalli village in Baghmundi Block, Chhotobakad in Jhalda Block and Bersa village under Balarampur Block);.the total population of Birhor tribe are dwindling day by day.

The Birhors

The Birhors are a nomadic forest tribe; their life span or life expectancy is significantly low and they are on the verge of extinction. Study found that most of the primitive tribal groups still leading a nomadic life. Its' amazing that still Birhors keep moving from one place to another in search of foods and survive by eating roots, fruits, flowers, leafy vegetables, mushroom and leaves from the forests and are compelled to live a primitive lifestyle.

The Birhors are under stern threat from existing model of developmental in the country; there is need to jointly fight against the forces that exploit the natural resources for economic growth. Existence of tribal community is threatened after country's developmental projects deprived them of their land, water, forest including other natural resources.

It's found that Birhors are highly vulnerable to hereditary hemolytic disorders and have a high degree of morbidity and mortality affecting their health and quality of life across the country. Studying about the life spans (age) of the present population of

Birhors living in the several ‘tandas’ across Jharkhand, West Bengal, Chhattisgarh and Orissa, we have found that their life span are spread between the age-group of 0 to 55 plus. Though the average life span found among the Birhors varies between 38-45 years.

During the study it was found that around 10 percent children belonging to 5 to 6 years of age group are available in their families. Tinny babies of age one year are about 3 percent, while children between the age-group of 6 to 15 years are about 14 percent, whereas the population between 40-45 years and above are very less, about 0.45 percent.

While mortality rates of Birhors are varying according to their age-groups. In the age-group of 0 to 5 years, it is found that almost 18-20 percent children die due to diarrhoea, cold and tuberculosis; while in between the age-group 8 to 14 years reasons for death are severe cough and cold as well as fever. Though, in the age-group of 40 years and above, most of the deaths occur due to fever, asthma, TB and diarrhoea. The average life span of a Birhor tribal is between 38-45 years.

This indicates that length of the life of Birhors who are 40 years and above in age is shrinking. To restore the lives of older people, initiatives have to be taken immediately.

Research Area

Different tribal villages in the hilly terrain of Jharkhand, Chhatishghar, Odisha and West Bengal including Ayodhya Hills and its’ surrounding tribal villages.

Objectives

► How effectively we can join them with the main stream of development as well as society.

► How to solve their health issues, nutritional needs and increase their life span.

► To draw attention of the government towards the nutritional needs of the tribal.

Methods of Research

Research has been carried out by personal visit and observations, questionnaire, interviews and conversations with different tribal people in different villages in the hilly terrain across Jharkhand, Chhattisgarh, Odisha and West Bengal.

Besides the tribal people's opinion and comments, many earlier research reports, as well as views of educationalists, professors, head of departments of the concern subjects, particularly of anthropologists have been taken into consideration during this study and research.

A literature survey was carried out on the study area before the field work started. Most of the works were based on field study. The present work is the outcome of extensive study and survey of different tribal villages of Jharkhand, West Bengal, Odisha and Chhattisgarh to collect information on the nutritional needs of tribes. During field work, interviews were conducted.

Besides in-depth study the contents had been taken from relevant books, articles, journals and websites. The Method used is analytical and descriptive. Data from both primary and secondary sources have been taken.

Results and Discussion

Genetic Study in-need for holistic development of Birhor's

Health problem is one of the major among the Birhors. The risk is increasing day-by-day with extensive deforestation, frequent climatic calamites, change in traditional economy and other socio-economic factors.

Study found that Indian tribes are highly vulnerable to hereditary hemolytic disorders and have a high degree of morbidity and mortality affecting their health and quality of life across the country; there is great need of genetic

study to identify their various health issues for their holistic development. Tribes across the country mostly live in isolation in forests and hilly terrains, having their own way of living and socio-cultural activities. Existence of tribal communities is threatened after country's developmental projects deprived them of their land, water, forest and other natural resources.

Birhors a nomadic forest primitive tribe; their life span or life expectancy is significantly low and they are on the verge of extinction. Illiteracy, poverty, malnutrition, lack of proper health, hygiene, bad food habits, irrational beliefs are the factors which aggravated their nutrition, disease as well as health status.

Though during the study it is found that the high mortality rate and short life span among the Birhors, might be lot of reason behind it, but a strong region is the marriage among their close relatives. Due to this many recessive characters appear which leads to fatality. Besides all these a few interacting factors are genetic disorders, forest ecology, sexually transmitted diseases, and infant mortality rates.

Data pertaining to common hemolytic disorders, genetic disorders and other hereditary disorders among the Birhors' tribe are still very scanty. Thus a large number of genetic studies are essential which needs to be carried out at the earliest by the government for their development.

It is found that Birhor mainly depend upon hunting and food gathering economy

and residing near the forest having very low density of population. They often fragmented into smaller groups because of scanty and sporadic distribution of resources. Often these small groups deviate mutually from each other due to breeding practices.

Marriages with close relatives occur in a relatively high frequency thus causing several known genetic disorders which affect the health of the Birhor people.

Human Genetics and Environment

Human genetic is the study of human genes which make us know what we are. Our natural makeup is determined by our genes which we inherit from our parents.

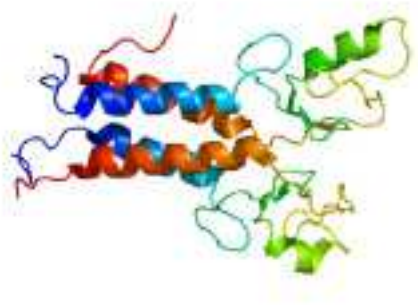
The collection of gene expressions comprises what is called our genotype. We have inherited these alleles, half from our father, half from our mother and we are stuck with them. We can not change them except by mutation that is abrupt of sudden change in structure, so that our genotype remains constant throughout our life.

However our genotype reacts with the environment to produce our outwards appearance, our character and personality which make what is know as our phenotype. Thus our genotype plus environment constitute our phenotype. No two individuals have the same genotype, except identical twins and no two individuals

who phonotypical look alike are genetically similar. The environment for any individuals has a vital importance. For ultimate survival and indeed for the best performance the environment must be the most suitable for the genotype.

The genetic concept of natural selection has emphasized the role of differential fertility, mortality, migration, population size, matting pattern including more in shaping genetic structure and composition of human populations. Socio-cultural practices are related to demographic and ecological niches and affect the biological make-up and function of a tribal population. Biological variations are related to ethnic and ecological background of a population.

The subsistence economy of a tribal population have obvious effects on population density, population size, marital isolation, age at marriage, sex ratio, fertility, mortality, migration and such other parameters of population structure which directly affect the hereditary characters in the successive generation, propagation and selection of particular character. It is also influence by the level and type of nutrition, the incidence and type of disorders and diseases, sanitation, personal hygiene and therapeutic practices. These parameters altogether influence the biological variability of a tribe.



The tribe mainly depends on hunting and gathering economy and living near the forest have a low density and small size of population. They are often fragmented

into smaller groups because of scanty and sporadic distribution of resources.

These small groups deviate mutually from each other due to breeding practices. Marriage with close relatives' occur in a relatively high frequency with the several known genetic consequences, such as loss of variation in the offspring, combination of undesirable carried by both parents leading to serve disorders affecting health, genetic drift and so on.

Nature tends to eliminate the inferior genetic variations from a population. But in a small population, there is a loss of variety in each generation and natural forces have little to select from and may operate against the entire group.

The variability of fertility is a useful demographic measure of genetic significance. Greater variability of fertility leads to greater opportunity of selection.

Earlier the traditionally genetic researches which was carried out among the tribal population used some well-defined and easily identified naturally occurring genetic markers like Blood Groups, Serum Proteins, Red Cells, Enzymes and many more biochemical traits, but most gene could not be mapped using these markers as they provide only enough reference points to study about one tenth of the total genetic map.

Prospect of Genetic Research

In India genetic research among tribals started only with the beginning of this century. Traditionally genetic researches in the tribal population have been carried out using some well defined and easily identified naturally occurring genetic markers like blood group, serum, protein, red cell enzyme and others.

But most genes could not be mapped using these markers as they provided only limited reference points to study about one-tenth of total genetic map.

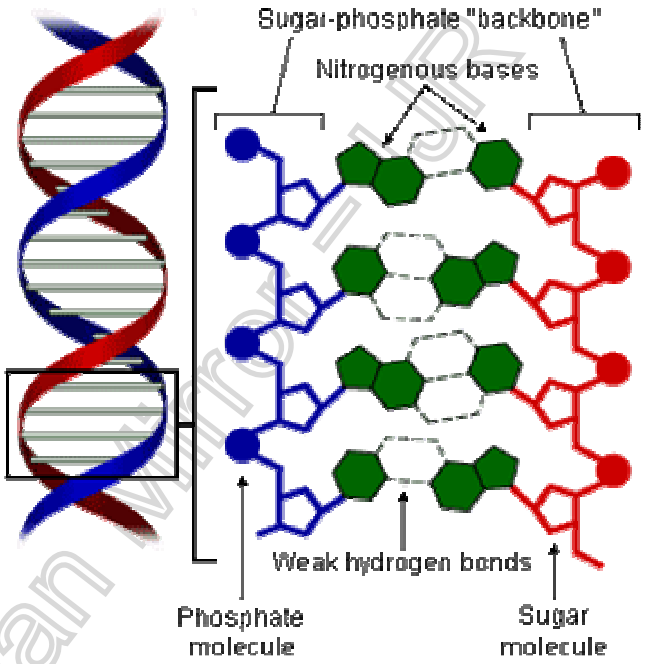
The emergence of the recombinant DNA technology made it possible to define a large number of polymorphic marker loci which can readily be detected by the techniques like gene cloning, restriction fragment length polymorphism, DNA sequencing etc.

Restriction fragment length polymorphism (RFLPs) now a days promise to be more informative. Because the DNA coding sequences show not only more variations than their corresponding proteins, but the noncoding sequences also display polymorphism. RFLPs, involves the isolation of single copy probes and the determination of variants in the populations.

Approximately one in three copy probes show polymorphism. Till date more than 8-10 thousand RFPLs are known, These RFPLs makes excellent markers for mapping human diseases.

Earlier before the emergence of DNA recombinant technology, many disease loci had been assigned to human X-chromosome, but few had been shown belonging to the established linkage groups.

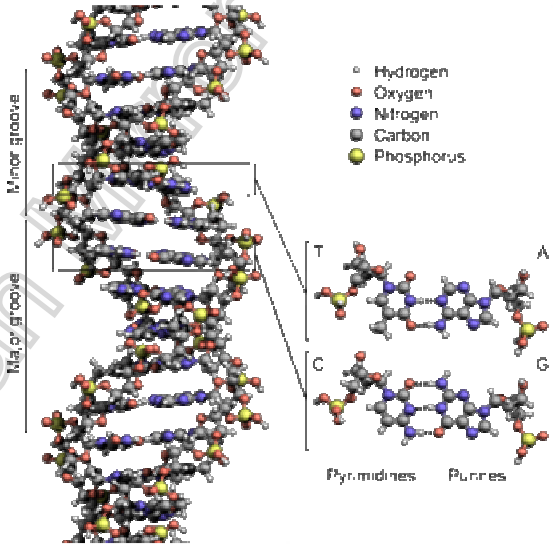
This was because the main linkage groups were localized at the telomeres.



Applying RFLPs as genetic markers the entire human chromosome has almost been completely mapped. The markers are well distributed sufficiently along the chromosome to enable the mapping of about any sex linked disease. DNA technology provides new tools for identifying genetic cause of diseases. And using the RFLPs the cause of occurrence of such disease has been unfolded.

Molecular biology thus opened up an entirely new approach to identify the causative factors of several genetic disorders. In past it was essential to understand the biological function of a gene before searching its localization on a chromosome. Such genes do include those causing hemoglobin abnormalities in sickle cell anemia and the enzyme deficiency in phenylketonuria (PKU).

But DNA markers can magically be used to locate a gene even when the nature of a genetic defect is still unknown. Now the emphasis should be given to search the whole genome and find those sections which are really relevant to identify the genetics of major human diseases.



Notably, human genetic variability proposes a genetic paradigm of health and diseases such that health is viewed as a state of equilibrium and disease as

disequilibrium in relationship between men and environment. Any biological function involved is ultimately dependent on environment; the interaction between environment and function is controlled by a gene product (genotype).

The interaction results either when the environment components is changed significantly or when the gene product is modified by mutation. The genetic paradigm recognizes the role of genetic factors for individual disease susceptibility or resistance.

Thus for diseases involving prominent genetic component like— hemoglobinopathy, thalassemia, G-6-PD deficiency and many other biochemical markers. Their control requires a different approach. As a result of founder effect genetic drift or selection of particular Mendelian characters may occur at unusually high frequency in specific population or locality.

Human genetic have major contributions and crucial role to play for the elimination and prevention of the major genetic disorders harbouring the tribal communities across the country.

Not only in Jharkhand but across the country tribal communities in need special attention in this regard from genetic and public health point of view.

Conclusion

The problems of tribal populations are manifold. Health problem is one of the major among these people. Though documented information on the incidence of genetic disorders is scanty, the risk is increasing day-by-day, with extensive deforestation, frequent climatic calamities, change in traditional economy including other factors.

The tribals are suffering badly with the malnutrition, improper medical facilities, impure drinking water, poverty, illiteracy, certain irrational belief systems and special and such other factors which further aggravate their health problems.

Now the question is that how anthropologists, geneticists, molecular biologist, medical persons would up-lift their health status especially minimizing the risk of genetic disorders, when the situation is so complex.

Albeit, tribals are the weakest section of the society, benefits of the recombinant DNA technology should reach up to the grass root level to ensure the usefulness of human genetic researches.

Study found: -

Firstly more emphasis should be given on genetic education to the tribes.

Secondly there should be a 'Genetic Tribal Research Center'— dealing with the genetic disorders.

Thirdly, a Genetic Counseling unit should be attached with the Tribal Research Institute, which are in touch with the respective tribal groups in their areas.

Fourthly, using recombinant DNA technology the abundant polymorphic variations present in human populations can be tapped for gene mapping and linkage studies which utilized to provide greater insight into pathological process leading to a better understanding of the molecular basis of inherited diseases.

Fifthly, there is a need for combining the interests and techniques of Anthropology, Genetics, Medicine, Ecology, Pharmacology, Nutrition and Social Sciences for comprehensive understanding of the problem of the tribals.

Study found an urgent need of Birhor's 'genetic study' to identify various health issues for their holistic development. The Government should immediately constitute a team for the sero-genetic, demographic as well as haemolytic study of Birhors in a bid to protect them from extinction and to diminish their mortality rates.

Background

Here are some elaborations for those readers from non-scientific backgrounds for clarification purposes.

DNA (deoxyribose nucleic acid) is the building block of life. DNA is located in the centre of the cell in a structure called the nucleus. The DNA in the nucleus is a ribbon-like structure; inside a cell DNA is stored in a condensed form called chromosomes.

Genes are hereditary unit consisting of a sequence of DNA that occupies a specific location on a chromosome and determines a particular characteristic in an

organism. Genes undergo mutation when their DNA sequence changes. Genes control cell growth and development, and determine appearances such as colour of eyes, hair etc. Genes are the biological material that can be passed from the parents to their offspring.

Chromosomes contain matching pairs of a specific gene which is located in the same position on each chromosome. One copy of a gene is inherited from the mother and one from the father.

Study of genetics – Genes can be passed from one generation to the next. A study of genes can indicate a person's genomic origin. Certain diseases are caused by genetic mutations and as genes can be specific for a certain race, a study of the pattern of genetic diseases can point to the genetic similarity of a group of people.

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