Example of research paper on natural selection and disease

Science, Genetics

Studies have proven the legacy of natural selection in the continuity of diseases pinpointing some regions where it has played a role in propagating disease. Evolutionary forces therefore to a huge extent play a major role in the development and propagation of diseases because of selective pressures that contributes to the resistance or development of alleles or genes that cause these diseases. On the basis of hereditary, human disease can be traced back into the years and its development be observed in better understanding how natural selection comes into play(Fisher 1999). This way, the factors that cause disease causing mutants can be singled out therefore observing how some diseases come into being and how they are carried by some groups of people and not others.

Natural selection comes up in different ways and the most common are, through differential reproductive success and changes in the environment (Vogel 19970. This causes the genes to be altered in such a way that they do not function like they are expected to any more. Environmental factors may be disasters or dramatic environmental changes. In such situations, individuals are exposed to gene altering situations that will lead to a group of organisms developing certain characteristics. These characteristics can be passed down from one generation to another either within the affected group of organisms or others outside the group in case there is an interaction with organisms outside the group, an example in time is the people living around Hiroshima and Nagasaki in Japan. It is imperative to understand through such a case that natural selection can help in the propagation of some attributes carried by individual organisms from generation to generation a disease will therefore survive within a certain population thanks to this.

Genetic diseases have evolved over time and some have been naturally conquered all thanks to scientific research. First, one needs to understand what genetic diseases are. These are diseases that are caused due to an abnormality observable in the DNA of an individual. These abnormalities vary in regard to their amounts; it can be a mutation on an individual gene or even the entire chromosome. When such mutations are present in the genetic material of the DNA of an individual, chances are that these mutations can be passed down from one organism to another for instance from a parent to a child. Chances are that the mutations will be passed down from generations to generations and if a disease is associated to the mutation, then the disease will be found in the carriers of these mutations or genes. This in regard to natural selection will affect those people who have that problem.

There are various diseases that have been associated to some groups of people who belong to certain ancestries. These diseases can therefore be said to be associated to the gene mechanisms of the descendants of these people. Some very clear example include the Tay- Sachs disease which is very common among Eastern European Jews, sickle cell anemia that is widely associated with people of African ancestry, smallpox among people of ancient Europe and native Americans and so many more. Genetic variants among people of a given origin have therefore exhibited attributes of a certain disease leading to analyses that explain that natural selection is behind the evolution of some diseases and infections (Fisher 1999).

When an example of a disease like malaria is looked at closely, it is understood that sickle cell anemia plays a key role in its prevention. In the

presence of a sickle cell anemia allele, an individual will not suffer from malaria. This explains how natural selection comes in because the diseases is naturally selected by the body and therefore cannot attack the body and this is in favor of the presence of sickle cell anemia alleles. Natural selection in such a situation serves as the way out for the survival of recessive alleles in heterozygote and posing a great harm to homozygote. These alleles will then be passed to future generations because the carriers are able to reach reproductive age. The future carriers will be able to withstand threats of diseases and infections associated to it like in the example of sickle cell anemia and malaria.

In the propagation of a disease, there is normally a tendency of a certain diseases being exhibited within family cycles. Catching such diseases just happens within the setting of the related people or organisms. In other instance, the tendency to fight such diseases also lies within that given family of people and this therefore means that there are scientific explanations behind this. This is the point at which natural selection is used to explain such occurrences. Being related or not in terms of ethnicity is therefore either beneficial or destructive. In the case of Tay – Sachs, the disease works not the benefit of the Jews of Eastern Europe origin but to their disadvantage simply because they are the carriers of these genes (Vogel 1997). These genes are passed down from heterozygous parents to their offspring much to their disadvantage because the offspring don’t live up to adulthood. For those who do, chances are that they are also carriers and that they can pass the genes on and on. It is for this reason that to this day, the disease is prevalent among them and not much scientific

breakthrough has been done to stop this. Natural selection in this case disfavors these Jews much to their disadvantage.

All in all, resistance genes in a given group of people of a certain ancestry can possess genes that may work to their favor or to their disadvantage. Through natural selection, they may have genes that will work for them so as to dramatically increase their chances of survival thereby increasing their population in a given place. This is all due to possessing genes that help them fight some diseases that may have proven to be a threat to their lives therefore hampering population increase. On the other hand, natural selection can work to the disadvantage of another group of people with a common ancestry just like in the case of Jews of Eastern Europe origin with regard to Tay – Sachs disease. Natural selection is therefore helpful in understanding the spread of given diseases over a long period of time among some ethnic communities. Through the study of the genetic composition of people or even organisms of these backgrounds, it is easier to understand why some diseases are more rampant among certain groups of people and not others. Knowing the evolutionary histories of these diseases is as important because at least one gets to understand the diseases too in an effort to find possible solutions to their spread.

References

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Vogel, F. (1997). Human Genetics: Problems and Approaches, Vol 878. New York: Springer