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Genetics

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Genetics Article Review Summary

The background of the article explained how cystic fibrosis occurs and how there are different mutations in the protein that affects cystic fibrosis. The protein that can get mutated and lead to cystic fibrosis is called the cystic fibrosis transmembrane conductance regulator, also known as the CFTR. Although there are many different types of mutations that can affect CFTR, it has been proven that most people who have cystic fibrosis have at least one copy of the most common mutation Phe508del CFTR (Middleton, P.G. et al., 2019). Unfortunately, the effects of cystic fibrosis and having this mutation in this protein affect people negatively and this experiment was to test a different method of treating people with this kind of mutation to see if better results on a person's health would arise from it. Many people are homozygous for the Phe508del CFTR who have cystic fibrosis, and for those who are homozygous, there is a type of medical treatment or "modulator therapy" (Middleton, P.G. et al., 2019) that can be given to these patients to help improve conditions. However, if someone is heterozygous with a single gene of Phe508del and another gene of a different CFTR mutation, the current method of treatment is not effective (Middleton, P.G. et al., 2019).

This experiment tests a new method of treatment for those who are heterozygous and not homozygous of the mutation Phe508del. The treatment used for those who are homozygous include one corrector, "either lumacaftor or tezacaftor, with the potentiator ivacaftor" (Middleton, P.G. et al., 2019). The new treatment being experimented is two correctors with the same potentiator of ivacaftor. The two correctors are elexacaftor and tezacaftor. The article continues to talk about the method and materials that were used and carried out through the experiment. This experiment was conducted at around a hundred different sites around the world on hundreds of different patients being twelve years of age or older. The experiment was randomized, and the patients received either the new treatment being tested or placebo for about six months. (Middleton, P.G. et al., 2019).

The results of this experiment proved that this new treatment was effective for helping the effects of cystic fibrosis. There were some unexpected medical problems that occurred during the experiment with some patients, but most were mild or moderate and not severe. They were also consistent with complications that occur in placebo and the majority of the problems that arose during the trial were treated or resolved during the experiment. (Middleton, P.G. et al., 2019). This trial showed that the new treatment of elexacaftor-tezacaftor-ivacaftor on patients with one single allele of Phe508del showed many improvements in different areas such as BMI, lung function, rate of pulmonary exacerbations, and more. There were no life-threatening outcomes and aside from some common medical conditions that arose from it, it was a safe and successful outcome that this new treatment would be effective for heterozygous Phe508del CFTR cystic fibrosis patients. Patients who previously did not have a form of successful

treatment, now have a way to improve some of their living conditions (Middleton, P.G. et al., 2019).

References

Middleton, P.G. et al. Elexacaftor-Tezacaftor-Ivacaftor for Cystic Fibrosis with a Single Phe508del Allele. *N Engl J Med* **381**, 1809-1819 (2019).