

CHLOROQUINE: THE ROLE IT PLAYS IN OXIDATION

A previously used drug for systemic lupus erythematosus (SLE) is chloroquine. Chloroquine is a 4-aminoquinoline that suppresses the immune system. It is also used widely for malaria and rheumatoid arthritis. Our study sought to find out more about the relationship between chloroquine and lupus and we hypothesized that chloroquine had a significant impact on oxidation. This report describes the methods used to test our hypothesis; because we are at the beginning phase of the research, it is too early to tell whether chloroquine has a specific effect on oxidation.

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BACKGROUND

The drug chloroquine was used to treat patients who have lupus; however chloroquine can cause blurred vision and even blindness. There is little known on why chloroquine affects lupus.

METHODS

To begin, I put two tubes beside each other and marked the tubes, "A" and "B." Tube A was the experimental tube, which contained chloroquine and tube B was the control, without chloroquine. I added 3 mL distilled water to both tubes, .05 mL chloroquine (16 μ M) to tube A and .05 mL distilled water to tube B. Both tubes then received 0.10 mL of EDTA (313 μ M) and .05 mL of NaOCl (16 μ M). Without incubation, I added .05 mL of dithiobisonitrobenzoic acid (16 μ M) and .05 mL cysteine (16 μ M) to both the tubes. After waiting for a yellow color to appear, I placed each tube in the spectrophotometer to measure the absorbency. The spectrophotometer was set at 420 nm. This process went on for fifteen minutes for each of the testings. The same was also done for each control group. Once the averages were complete, I performed a *t* test of the values that were collected. I did the *t* test for the fifth and last rows for both the experimental and control groups.

RESULTS

After completing 16 experiments, most of the data for both the experimental and control were consistent. Based on the results we can see that the chloroquine is blocking the hypochlorite due to the high levels of absorbency. Knowing that hypochlorite is an oxidizing substance, this statistically proves that the presence of chloroquine acts as if hypochlorite is not even there. In contrast, we did not find the same results for the control group. The end average for the experimental group was 0.285625 and the average for the control was 0.2125, which means that oxidation is taking place in the control group because the number values are falling. The absorbency levels were much higher in the experimental group than the control group.

CONCLUSION

In conclusion, the last averages (.285625 and .2125) demonstrated that the drug chloroquine may have an effect on oxidation due to the high absorbency levels.

RESOURCES

1. www.ncdc.gov/travel/content/MalariaDrugsPublic.as.
2. www.drugs.com/cons/Chloroquine.html
3. www.hopkins-arthritis.org/arthritis-info/lupus/.
4. Aladjem, H. *The Challenges of Lupus: Insights & Hope*.
5. Blau SP, Schultz D. *Living With Lupus: The Complete Guide*.