



# CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

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| <b>Name(s)</b><br><b>Shivani Bharadwaj; Ella Foster</b>   | <b>Project Number</b><br><b>S2201</b> |
| <b>Project Title</b><br><b>The Effect of Smoking on the Incidence and Severity of Systemic Lupus Erythematosus</b>  |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>The objective of this case-control study was to determine the effect of cigarette smoking on the incidence and disease severity of systemic lupus erythematosus.</p> <p><b>Methods/Materials</b><br/>60 patients with systemic lupus erythematosus (cases) and 60 patients with non-autoimmune causes of joint/muscle pain (controls) were identified and matched for gender and age at a local arthritis clinic. They were asked to complete an anonymous survey regarding their smoking history and, in the case of lupus patients, details about their disease severity, including a disease activity score. Results were analyzed using statistical methods. Cases and controls were compared with regard to smoking history. A subgroup analysis of the lupus patients was also performed to further study differences in disease severity between lupus patients who had a smoking history and those who had no smoking history.</p> <p><b>Results</b><br/>This study showed no difference in the rates of smoking between the 60 lupus patients (cases) and the 60 non-lupus controls. However, the subgroup analysis of the lupus patients showed a significant increase in the self-reported disease activity score in lupus smokers (4.86 +/- 2.61) compared to lupus non-smokers (3.31 +/- 2.24), <math>p=0.025</math>. Also, lupus patients with a smoking history were significantly more likely to have neurologic disease with odds ratio of 3.43 (85% CI 1.1, 10.67) compared to non-smokers with lupus. Incidence of kidney and lung disease was not different between the two groups, and history of hospitalization for lupus was also not different between the two groups.</p> <p><b>Conclusions/Discussion</b><br/>This study showed no significant difference in smoking rates between lupus patients and controls, implying that smoking may not increase the incidence of a lupus diagnosis. However, the findings showed that when lupus patients smoke, they have more severe disease. Specifically, they have higher self-reported disease activity scores and a greater incidence of neurologic disease. Thus, patients with lupus should be cautioned against using tobacco products to reduce the risk of more severe disease.</p> |                                       |
| <b>Summary Statement</b><br>We showed that smoking may not increase the risk of developing lupus, but lupus patients who have smoked have more severe disease and are more likely to have neurologic involvement.   |                                       |
| <b>Help Received</b><br>We received help from Dr. Zuzana Foster at the Northern California Arthritis Center in recruiting patients to complete the surveys for our study. We designed our study and our survey questionnaire, and performed the statistical analysis ourselves.   |                                       |