CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34204

Project Title
The Effects of Non-Prescription Pain Relievers on Liver Tissue

Abstract

Objectives/Goals
The purpose of this experiment is to successfully determine if and what effects acetaminophen, ibuprofen, and aspirin have on beef liver cells and tissues. The liver is about the size of a football and sits just under your rib cage on the right side of your abdomen. The liver is like a filter it helps digest food by filtering out bad chemicals and substances from food we eat. The liver is a vital organ found in vertebrates. It is responsible for detoxification, protein synthesis, and production of bio chemicals responsible for digestion. The liver is necessary for survival there is no way to compensate for the absence of liver function in long term situations, however new dialysis techniques can be used for short term care. The liver is prone to damage by different chemicals and diseases.

Methods/Materials
Liver Cell Damage/Crush medications, Mix each medication in a test tube with saline, Let sit and dissolve for 1 day at room temperature, Cut liver into 6X6 cm sections, Add a 6x6 cm liver piece and 3mls of medication solution to water to 40 test tubes, Add a 1 cm liver piece and 3mls plain saline to 10 test tubes for control, Leave in test tube for ten days, Look at solution under microscope at 40X using a methylene blue stain, Observe damage to liver cells, Take pictures and record results. Liver Tissue Damage/Cut liver into (10) 6x6 cm pieces, Place 10 pieces in a container, Add saline to each container, Crush medication, Add 5mls of medicine to container, Observe results every two days for ten days to measure liver tissue damage, Repeat steps 1-6 for each medication and plain saline for control

Results
The results of this investigation to determine the effects of Aspirin, Ibuprofen, and Acetaminophen on liver tissue resulted that all test specimens did in fact have an effect on liver tissue. However Acetaminophen caused the most damage.

Conclusions/Discussion
In conclusion, I have learned that all the medication caused damage to the liver tissue tested. However the aspirin caused the least amount of damage. After all the research and testing I performed I have found that all medication in excess will cause damage to the liver, compromising all of the other organs that work together to filter and digest in our body. By limiting the medications consumed we can reduce damages caused to the liver and other organs.

Summary Statement
The object of this study is to determine what damage can be caused by different medicines to liver cells and tissues, this study should aid in making better pain medication choices.

Help Received
Mom took pictures. Microscope supplied by Mr.Alto SHS