

## ABSTRACT

**RESEARCH PAPER:** Effects of Antibiotic-induced Vitamin B12 Deficiency with and without Oral Administration of Vitamin B12

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**Background:** Vitamin B12, also known as cobalamin, is an essential vitamin involved with erythropoiesis. The human body is incapable of synthesizing B12. We rely on the bacterial flora located in our gastrointestinal tract synthesize and secrete vitamin B12, which can then be absorbed through our intestines and used elsewhere in the body. Vitamin B12 is an essential cofactor for methionine synthase and methylmalonyl-CoA mutase. Vitamin B12 deficiency will lead to macrocytic anemia. Without B12, reticulocytes cannot differentiate into erythrocytes. The human intestinal microbiota is essential for vitamin B12 synthesis in the host. Antibiotics kill the bacteria in our gastrointestinal tract, as well as other bacteria. **Methods:** Daily injections of antibiotics will be given to male Lewis rats. Vitamin B12 and glucose will be fed to the experimental and glucose will be fed to the control. After 2 months, fast overnight and obtain blood samples by milking the tail. Vitamin B12, methylmalonic acid, homocysteine and reticulocyte serum concentrations will be determined using spectrophotometric assays using biochemical kits and complete blood counts. Blood smears can be used to look for abnormally large erythrocytes. **Anticipated Results:** A statistically significant increase in vitamin B12 and statistically significant decrease in methylmalonic acid, homocysteine and reticulocyte serum concentrations. This will confirm that oral administration of vitamin B12 will increase and decrease these levels respectively in rats taking long-term antibiotics. **Conclusions:** Such new information will provide new therapeutic therapies for those taking long-term antibiotics.