# Folic Acid

Folic acid ($C_{19}H_{19}N_7O_6$) is a B vitamin that is involved with DNA synthesis, RNA synthesis, and protein synthesis as it is required in the body for producing purines, pyrimidines, and the amino acid methionine. Folic acid is water soluble and is a cofactor to many enzymes involved in DNA synthesis. Folic acid is often used as a supplement for patients with megaloblastic anemia or pregnant women. Megaloblastic anemia is defined by folate serum levels below 2ng/mL. In patients with defective DNA, the synthesis of a product of folic acid is impaired and can cause malformation of red blood cells leading to anemia. Because two products (tetrahydrofolic acid and dihydrafolate) are made from folic acid to be used in the cell, folic acid is biochemically inactive. Tetrahydrofolic acid is broken down to methyltetrahydofolate which forms the amino acid methionine in protein synthesis.

The route of administration for folic acid is through oral consumption or intravenously. In the proximal portion of the small intestines, the drug is absorbed and appears in the plasma after 15 to 30 minutes. Prior to absorption, however, naturally occurring folates are enzymatically reduced to folic acid. Peak levels of folic acid are reached in the plasma within 1 hour. Folic acid binds effectively to the plasma proteins. Despite folic acid being regarded as not toxic, the usual therapeutic dosage in men and women is up to 1 mg, regardless of age. Any dose greater than 1 mg is excreted and does not enhance the hematologic effects. A maintenance level is usually given as 0.1 for infants, 0.3 mg for children under 4, 0.4 mg for adults and children older than 4, and 0.8 for pregnant or lactating women. Folic acid can hinder the effects of anemia if given a dosage greater than 0.4 mg when it has not been diagnosed. Folic acid is mostly eliminated through urine, but traces have been found in feces and the milk of breastfeeding mothers. The elimination follows a zero-order elimination process, excreting a specific amount per unit time.

# Works Cited

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