

Information on Folic Acid

It is hard to imagine that you can prevent newborn deaths, congenital malformations and paralysis in children and adults, as well as reduce memory loss or the risk of having a heart attack, stroke or cancer, just by taking a pill or eating bread or cereals¹.

The key could be in Folic Acid (FA), a vitamin of the B complex (B-9) that is becoming more and more relevant every day. FA is essential in the synthesis of various amino acids and, consequently, in the synthesis of DNA, since it favors the implantation of the egg and its development, since cell division depends on nucleic acids, avoiding miscarriages and infertility.

It is almost unbelievable that the lack of this vitamin during the pre-conceptual state (from 3 months before conception) can alter the genes and produce congenital malformations (CM). In this sense, it has been proven that consuming 0.4 mg of Folic Acid daily during this period, prevents neural tube defects such as spina bifida and anencephaly (lack of brain), which can cause from infantile paralysis to the death of the baby. Twenty percent of the paralytic patients treated in rehabilitation centers in Chile, such as those of the Chilean Telethon, correspond to this cause.

There is a mutation of the Folate Reductase enzyme, which is more frequent among Spanish women and Chilean women of Spanish origin, which causes them to require even higher doses of this vitamin, before and during pregnancy.



Figure 1. The pigeons in the lower row look healthier than those in the upper row, due to the fact that they are currently fed with bread enriched with Folic Acid (Observation by Dr. Bravo).

It is also considered that the lack of FA produces other congenital, cardiac and renal malformations, and even some cases of Down Syndrome, cleft palate and osteoporosis.

When there is a lack of Folic Acid, Homocysteine in the blood increases, which causes obstruction of the arteries, as well as elevation of cholesterol and triglycerides. If the cerebral arteries are affected, memory decreases and cerebral vascular accidents may occur. If the coronary arteries are affected, the risk of heart attacks increases.

¹ Bibliographic references can be found on the author's website: www.reumatologia-dr-bravo.cl, article "Folic acid in the prevention of congenital malformations, coronary problems, cerebral vascular accidents, cancer and other diseases".

In addition to reducing the tendency to memory failure and Alzheimer's disease, FA could prevent the appearance of colon, breast and cervical cancer; contribute to the healing of mouth ulcers and gum problems; correct certain anemias and leukopenia (low white blood cells).

Recent research sheds new light on how Folic Acid helps to keep us healthy. In particular, Dr. Bravo's studies on Joint Hyperlaxity, led him to relate that this condition, so frequent in Chile, is also caused by lack of FA, before and during pregnancy.

Therefore, in February 2006 he published in the prestigious American magazine *Arthritis & Rheumatism* (page 519) his theory that Folic Acid deficiency could be the cause of collagen alterations in Hypermobility Ehlers-Danlos Disease (EDSh); after also communicating it in his web site www.reumatologia-dr-bravo.cl, in English and Spanish, together with abundant information about FA.

It should be noted that recently, in April 2023, a group from Tulane University, in New Orleans, USA, published this same theory as a new observation, so Dr. Bravo contacted the main author of the article², Dr. Jacques Courseault, to inform him of its publication, which dates back to 2006, that is, 17 years earlier.

Courseault's (2023) studies suggest that reduction of Methylene tetrahydrofolate reductase (MTHFR), a genetic mutation that can lead to elevated homocysteine levels and lower folate levels, and which occurs in some cases of EDS, would lead to more tissue fibrosis and weak collagen tissue, and that this could perhaps be remedied by giving 5-Methyltetrahydrofolate, which is the end product of MTHF action.

In addition, there are studies showing that 10% of women present malabsorption of folic acid, so treatment with 5-Methyltetrahydrofolate is better for them; it is also indicated in those cases where, in spite of treatment with FA, folate levels remain low in the blood.

Apart from a malabsorption syndrome, the relative deficiency of this vitamin may also be due to organisms that present a higher demand or to excessive alcohol consumption.

There are drugs that reduce the action of folic acid such as diuretics with Triamterene (Hydronol-T.), sulfa drugs, antiepileptics, methotrexate and contraceptive pills.

However, studies are lacking to determine whether 5-MethylTHF or Folic Acid is better. The author, Dr. Bravo, points out that he has not used Methylfolate in his practice, but he has two decades of experience prescribing FA to approximately 10,000 patients, helping to alleviate or prevent cases of Hypermobility Ehlers-Danlos Syndrome, as well as congenital malformations during pregnancy, thanks to the regular consumption of this vitamin in women.

Regarding this last point, Dr. Bravo -suggests that, since it is not always feasible to know when conception will occur, every woman of childbearing age who is able to become pregnant should take

² J Courseault, C Kingry, V Morrison et al. Folate-dependent hypermobility syndrome: A proposed mechanism and diagnosis. *Heliyon*, 2023;9 (4): e15387 DOI:10.1016/j.heliyon.2023.e15387. This article cites 58 papers, but does not include that of Prof. Dr. Jaime Bravo.

0.4 to 1 mg of Folic Acid daily. This has been known for more than 30 years and has been proven, and should be disseminated by doctors and health personnel, as it is of vital importance.

Before it was more difficult to obtain FA from food, since it is only found in green vegetables (spinach and broccoli), fruits (bananas) and legumes, not to mention that when cooking these vegetables or toasting bread, 50% of this essential vitamin is lost. It is now much easier to obtain enough FA, since flour has been enriched with this component, so it is enough to eat three loaves of bread or a bowl of enriched cereals to ingest 0.4 mg of FA per day. However, it is quicker and safer to take a FA tablet or a multivitamin containing this vitamin of the B complex, since synthetic FA is better absorbed than the natural one from food.

It should be noted that the consumption of FA does not produce significant side effects, since it is water-soluble, does not accumulate in the body, is inexpensive and is not fattening. However, it is not advisable to take more than 1 mg of FA per day, unless recommended by your doctor.

In case of megaloblastic anemia³, FA should be administered with Vitamin B-12 (0.4 to 1 mg per day), to avoid masking the neurological problems -fatigue, difficulty walking and breathing, pallor, loss of appetite, diarrhea, numbness and numbness of the hands, problems with the tongue and sense of smell, bleeding gums and personality changes-, which are usually associated with this disease that affects 2% of the population.

For their part, those who eat little or no meat, vegetarians and vegans, among others, should take vitamin supplements containing FA and Vitamin B-12.

In general, men over 40 and women over 55 should consume 0.4 to 1 mg of Folic Acid daily to prevent heart attacks, cerebral vascular accidents and venous thrombosis. It may even help prevent Alzheimer's disease, some cancers, osteoarthritis and osteoporosis, among other diseases. Adopting, of course, these suggestions in agreement with your doctor.

In general, to have a healthy and good quality life, it is advisable to exercise, not to smoke, not to consume drugs or alcohol in excess, and to eat a balanced diet, including plenty of fruits and vegetables.

For more information, enter "Folic Acid" in the search engine on the home page of the web site: www.reumatologia-dr-bravo.cl.

³ Megaloblastic anemia: anemia with large red blood cells.