

Folic acid,

Spina bifida and cleft palate.

Personal reflections.

This article must be considered as a personal interrogation on the role that folic acid could play in regard to certain apparently congenital malformations such as as spina bifida and the cleft palate in the dog.

Always sensitive to the suffering of our companions and to the sadness of the breeders of the bitch who gives birth to a puppy suffering from spina bifida or cleft palate, I undertook research on these two malformations that we come across in our English Toy Spaniels. The beginning of my research was not very fruitful, So knowing that the genome of the dog is rather near to that of the human (90%) I have therefore transferred my research towards the latter. After visiting many sites devoted to these malformations, I have concentrated my research on folic acid or vitamin B9 that was often quoted to have an extremely positive effect in preventing one or more malformations especially spina bifida, and secondly cleft palate.

Some definitions.

The abnormalities of the neural tube (ANT).

The abnormalities of the neural tube according to the most recent research (2004) are congenital malformations, but some originate from a combination of various genetic and environmental factors. Recent studies suggest disturbances in the activity of the méthionino synthesis that is in charge of the ANT (various abnormalities exist that affect the neural tube according to the sources, but the malformations and pathologies will be totally different).



The abnormalities of the neural tube would manifest themselves at the beginning of conception and always according to these studies a supplement of folic acid could have prevented them. Thus, it was noted that the percentage of these malformations would be greatly reduced in the women who took a sufficient supplement of folic acid, provided that this supplement is started well before conception, more or less a month, and certainly during the first twenty to twenty-eight days of the beginning of pregnancy.

In the women who already had children with spina bifida, following pregnancies showed a greatly reduced incidence of children born with spina bifida if they had taken a supplement of folic acid well before the conception, It is necessary nevertheless to note that their female children will have to take this supplement when they are of childbearing age.

The pre conception consumption of folic acid can therefore reduce the risk of abnormalities of the neural tube.

Spina bifida.

The word «Spina Bifida» is Latin; spina means «thorn» or «spine» and bifida «split»; it signifies a posterior back opening at the level of the vertebra in the spinal column associated with an affection of the spinal marrow. Summarized, the neural tube remains open. The abnormalities of the neural tube are multiple and cause various malformations at the places where they are situated. Regarding the dog we will only consider malformations situated at the level of the 6th and 7th lumbar vertebra and the sacrum and ignore «aplasie» (lack of growth in tissue or organs).

Cleft palate.

Cleft palate exists in different forms, the most frequent one in the dog is situated at the soft palate and can spread to the hard palate. These malformations result from a merger defect or of fusion defect of the different embryonic buds that constitute the face (at the very beginning of pregnancy).



Acide folique

There are different forms of Cleft Palate; these malformations are caused by a merger defect or a failure in the closing of the different bones in the head (in the very beginning of pregnancy).

A Cleft Palate is primary if the merger defect concerns the medial nasal process (rabbitmouth) and deepens itself by the absence of a merger in the incisive bones in the front.

It is incomplete if it touches the separation of the soft plate. Often it is very small and hardly visible; in such cases it does not necessarily will cause problems in the long term.

It is frontal when it touches the front part of the palate; the function of this part is to separate the nose from the mouth; in this case the milk coming from the bitch's nipples gets into the nose of the puppy; this is the most common case in dogs.

Definition of aplasia: absence complete or partial from a tissue, an organ or a structure, starting from embryonal life

Generalities and toxicity.

Folic acid is water soluble, that is to say that it dissolves in water (which is why certain foods cooked in water lose some of their folic acid). On the other hand, preserved in good conditions, it is indestructible.

Just as with vitamin C, there is rarely an excess of folic acid, any that is not required is expelled naturally. Folic acid is stored in the liver. If you give a certain quantity of pure folic acid to your female dog (consult your veterinarian) such as a multi vitamin supplement or a food rich in folic acid, your dog is not normally at risk. On the other hand it is not necessary to give vitamins and folic acid at the same time as a multi vitamin supplement !! An over dose of certain vitamins or calcium has shown to be very dangerous. (see our previous article on this subject).

Suplied quantities:

According to the study by Elwood & Colqhoun (1997), the advised quantities are:



0,5 mg/ kg/day

So for a dog of 7 kg you supply 3,5 mg a day.

Sources of folid acid.

Though folid acid is present in several natural articles of food as well as in several vitaminsupplements, the percentage of folid acid or vitamin B9 is much too low to play a role in the prevention of abovementioned malformations. It seems that a company of industrial food created a «special» food enriched with folid acid.

After verification it is evident that this new food contains 15 mg folid acid per kg (which is ten times more than in other food) and is made for the English Bulldog. The quantity of this food is still not enough and the dry food is not suitable for our breeds. But, apart from the dosage of folid acid, which is very important, one must be aware of the fact that this supplement must be given at least one month before the mating and must continue until the second week following that last mating to get an optimal result. For bitches with irregular seasons we advised to give the supplement from the third month after her latest season to be sure she will have an optimal level of folid acid.

Furthermore one must bear in mind that folid acid is sensitive to oxygen, light, heat and water. The only way to give it to the bitches at the moment is the way of medicine.

To summarise.

Folic acid participates in the metabolism of proteins (amino acids) as well as the genetic equipment DNA and RNA. These are essential in the different phases of conception and life. It is equally applied to the synthesis of neuromédiateurs that have a basic role in the metabolism of the nerves and brain.



Acide folique

Now, one knows that if a lack in folic acid will provoke a slowdown in cell multiplication, it should have an equally important role in the development of cardio vascular diseases and certain cancers (a protective role).

An article from 1992 entitled "folic acid, cleft palates, and whelping problems" written by Tania Coquhoun of Boston terriers, mentions the benefits of providing folic acid. In this article, devoted to whelping and lactation, the author noted a decrease of 30 to 50% in the necessary time of the whelping. It mentions equally other benefits of this acid as well as the study conducted by a university on white rats and concerning the Palatine fissures.

This article anticipated the results from the Study in Boston Terriers by Elwood & Colqhoun in 1997.

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Sources and info.

Internet.

<http://www.sante.gouv.fr/htm/dossiers/perinat/recomand.htm#2>

http://www.afssa.fr/ouvrage/fiche_apports_en_vitaminb9.html

<http://cani-wap.chez-alice.fr/index.html>

http://www.phac-aspc.gc.ca/fa-af/index_f.html

http://www.hc-sc.gc.ca/home-accueil/search-recherche/f_e.html

- All knowledge on the nutriments that nourish, warn and heal (Nutriments dogs and cats), Professor Dominique Grandjean, publication Aniwa.

- Prevention of the spina bifida by the acid folique

- Communicated press from Royal Canin ...

It seems that treatments against tapeworm in the early stages of pregnancy could have an influence on certain malformations.

