Can asparagus have an influence on cancer? Latest study is causing a stir

Professor Gregory J. Hannon is the name of the man who is currently attracting the attention of cancer researchers and journalists around the world. This is because of the findings of a study which he, as Director of Cancer Research UK at Cambridge University with his colleagues Simon RV Knott and Elvin Wagenblast, published in the renowned journal “Nature” on 7 February 2018 [1]. In this article the researchers describe the potential impact of the amino acid asparagine, which is found, for example, in asparagus, on the spreading of tumour cells.

Let’s take a brief look at the theory:

 The metastasis of the primary tumour is one of the biggest challenges in tumour therapy. If the cancer has already spread to various regions of the body, the success of therapy is greatly diminished. This is why for some time researchers have been trying to determine the specific genes which lead to abnormal cells shedding from the primary tumour, finding their way to other organs via the bloody stream as so-called “circulating tumour cells”, and then attacking these organs.

The research group at Cambridge has now been successfully able to demonstrate how by deactivating so-called asparagine synthetase this type of “spreading” can be prevented. This enzyme is responsible – as you have probably already gathered – for the generation of the amino acid asparagine.

In trials with mice with breast cancer a medicine, which was originally intended for the treatment of leukaemia, proved effective in preventing the metastasis of the primary tumour. This medicine also had an impact on lowering the concentration of asparagine in the blood [2]. Furthermore, and of particular interest for us nutritionists, a diet low in asparagine also prevented the metastasis of the tumour in the mice. All these experiments, however, had no influence on the primary tumour itself.

So what does this now mean for cancer patients in practical terms?

Can a strict diet which excludes the amino acid asparagine really contribute to cancer therapy?

 Unfortunately, it is not easy to reach a clear conclusion. Asparagine is one of the non-essential amino acids which means it is synthesised by the body. There are

also many food products which are rich in asparagine: these include, in addition to asparagus, milk products, meat, eggs, fish and seafood, potatoes and pulses. Vegetables and fruit are particularly low in asparagine[3]. We need asparagine for various reasons such as building muscle and for the body's regeneration processes – for example, after chemotherapy or radiotherapy. If all of the food products mentioned were to be avoided, there would be a risk of malnutrition. This is a risk that is currently still responsible for 20 to 30 percent of all deaths of cancer patients.

Furthermore, the studies have only been carried out on mice and in cell lines so far. It is not possible to guarantee that these findings can be applied to humans on a one-to-one basis. In a statement on the applicability of results from animal-based research the Deutsche Forschungsgemeinschaft (DFG) expects that in such studies it is possible to predict "some 70% of the undesired effects which affect humans".[4]. This would mean that for almost every third finding no conclusions could be drawn about the impact on humans.

What this recent study by von Knott, Wagenblast and Hannon definitely demonstrates, however, is the important roles nutrition plays in connection with cancer treatment and prevention. And this study perhaps also really does provide a crucial component in the search of a cure. The most sensible support for the healing process to date, however, still remains the consumption of a balanced diet. In addition to fruit and vegetables this includes pulses, nuts, grains, eggs, fish, seafood as well as some meat. Each week we discuss what exactly a balanced diet can look like in this blog.

Read our detailed articles on the topic of healthy nutrition or get in touch with us to arrange free nutritional counselling for cancer patients and their relatives.

For further information on the topic of nutrition and cancer you can also read the TZM book "Stark gegen Krebs"('Strong against cancer' – in German only).

Sources:

1. Knott, S. R. V *et al.* Asparagine bioavailability governs metastasis in a model of breast cancer. *Nature* (2018). doi:10.1038/nature25465
2. PZ. Asparaginase: EU-Zulassung für Leukämie-Medikament. *Pharmazeutische Zeitung online* (2016). Available at: https://www.pharmazeutische-zeitung.de/index.php?id=62082.
3. aerzteblatt.de. Brustkrebs: Wie die Ernährung die Metastasierung bremsen könnte. (2018).
4. Brandstetter, H., Spielmann, H., Löwer, W., Spranger, T. M. & Pinsdorf, C. *Tiere in der Forschung: Naturwissenschaftliche, rechtliche und ethische Aspekte*. (Deutsches Referenzzentrum für Ethik in den Biowissenschaften – Alber, K, 2016).