



5 Questions about Hyperthermia treatment

Interview with PD Dr. med. Pirus Ghadjar
Department of Radiation Oncology and
Radiotherapy
at Charité Universitätsmedizin Berlin
January 2016





1. What is your experience with hyperthermia in practice?

We treat around 50 tumor patients a year using regional hyperthermia. In clinical practice, we restrict ourselves to tumor cases for which there is already proven efficacy, such as soft tissue carcinoma or cervical cancer. In trials, we are researching various other types of oncological diseases, such as bladder cancer. On balance, hyperthermia has not only proved to be very safe and well tolerated, but has also achieved some significant successes. Thus in the case of hyperthermia combined with standard therapy, we have often seen better local treatment outcomes, such as more effective inhibition of tumor growth. Moreover, in comparative terms, combination treatment has resulted in significantly longer recurrence-free periods and a higher survival rate for some patients.

2. Where do you see the particular potential of hyperthermia?

It is a well-researched treatment with a very favorable side-effect profile which makes traditional anti-tumor treatments, such as radiation therapy, more effective and supplements their effect. This means that it can facilitate the successful treatment of tumors for which standard procedures alone would be inadequate. In addition, it facilitates treatment which is gentler on the patient by enabling the reduction of chemotherapy and radiotherapy dosages and thus minimizing the side effects of these forms of treatment.

3. How does it work?

The heating can have various effects. These include the formation of heat shock proteins which stimulate the immune system to break down mutated cells. Furthermore, at temperatures over 40°C (104°F), the repair mechanisms of cancer cells start to fail, with the result that they are less able to compensate for the damage caused by chemotherapy or radiotherapy. Finally, blood circulation and oxygen supply within the tumor are improved. This results in better distribution and absorption of the chemotherapeutic drugs within the tissue, and more of what are known as free oxygen radicals are formed during radiotherapy. These play an important role in killing cancer cells.

4. When in particular would you recommend hyperthermia?

It is, for instance, immensely valuable when, as is often the case with locally advanced tumors, there is hypoxia, i.e. the tissue is inadequately supplied with blood and oxygen, which means that chemo or radiotherapy have a limited or no effect. Hyperthermia helps here because it improves blood circulation and oxygen supply to these areas, and at temperatures over 43°C (109°F) it can even kill off cells directly in oxygen-deprived areas. In addition, it is very useful in cases where it is only possible to use low doses of radiation to avoid damaging the tissue too severely. This applies, for instance, in cases of cancer recurrence in an area which has already undergone radiotherapy before.

5. What challenges do you face with this form of treatment?

Fortunately, as a rule, the treatment has no side effects. However, it does take up to 90 minutes with the appropriate preparations, which can be a strain for patients. Although there is substantial evidence of efficacy for some types of tumor, regional hyperthermia is only carried out to a sufficiently high quality standard at a few university clinics. One of the challenges for the future is to publicize what are, in some cases, very good therapy outcomes and thus work towards expanding the use of this approach.