

Comment regarding the commercial application of adult stem cells

The General Medical Council Nordrhein is warning against the commercial therapy with autologous stem cells

Providers of commercial stem cell therapy, for example in Cologne or Düsseldorf, are predominantly seeking contact via the internet to patients from all over the world with a multitude of severe and to some extent incurable diseases. Aiming at the fear and hardship of these people, they offer very expensive treatments, the efficacy of which has been insufficiently tested.

Thus, the transplantation of autologous bone marrow stem cells is supposed to be conducive to the healing of diseased tissue in diverse illnesses such as

- Amyotrophic lateral sclerosis,
- Alzheimer,
- Arthrosis,
- Diabetes,
- Erectile dysfunction,
- Early-infantile cerebral palsy,
- Cardio-vascular illnesses,
- Macular degeneration,
- Multiple sclerosis,
- Parkinson's disease,
- Apoplexy (stroke) as well as
- Injuries to the spinal cord.

Significant medical findings regarding the efficacy and the success of these treatments in the mentioned diseases are currently not available. The costs for these procedures are in the four- to five digit Euro-amounts.

Reputable scientists and medical associations are not just warning against the lack of efficacy, but explicitly against the potentially dangerous side effects of this therapy.

The General Medical Council Nordrhein cannot recommend an autologous stem cell therapy in the mentioned diseases.

What are stem cells?

Stem cells distinguish themselves by being able to multiply unlimited and generate all cell types of the body (for example muscle cells, nerve cells, blood cells). Depending on the origin of the stem cells, one differentiates between embryonic (from the embryo), foetal (from the foetus) and adult stem cells (from infants, children and adults). Up to now adult stem cells have been detected in 20 organs of the body, so for example in the bone marrow, the blood, the brain and in the blood of the umbilical cord.

The longest known sources for adult stem cells are the blood and the bone marrow. Here, one finds one stem cell in 10,000 cells, whereby one stem cell from the bone marrow can renew the entire blood system of an organism. Unlike embryonic stem cells, according to the current state of research adult stem cells have a limited development potential; their reproduction rate and life span are limited. In a laboratory environment they can be induced to develop into specialised cells with the aid of growth factors.

How far advanced is the treatment with adult stem cells?

Stem cells of the blood can be isolated and then transferred into other organisms. This characteristic is fundamental for the transplantations of blood-building stem cells from the bone marrow for the regeneration of blood in malignant blood diseases, successful for many years, for example in case of leukaemia as well as other severe disorders of the blood- and immune system.

The term autologous stem cell transplantation is used, when the donor and recipient is the same person. Such transplantation may be necessary if, in case of a malignant illness, aggressive chemo- or radiotherapy is applied, the side effects of which can lead to a threatening damage of the bone marrow. In such a case, blood stem cells of own bone marrow may be taken from the patient prior to the actual tumour treatment, which are returned to the patient after the damaging therapy. The aim is the re-settlement of the bone marrow with own stem cells, in order to enable an endogenous production of vital blood cells.

What are the current problems with this form of stem cell treatment?

What are the risks?

The identification of organ- and tissue specific stem cells in the organism as well as their harvest in sufficient amounts creates problems.

Following the transplantation of adult stem cells into foreign tissue, for example a bone marrow stem cell into the heart muscle, the stem cells do not develop all the typical characteristics of this tissue, therefore they are not able to completely take over the function of the normal organ cells.

The control mechanisms, which are monitored by the stem cells, are much more complex than believed in the past. It is possible that in some case the effect of the treatment is rather based on the application of growth factors for the harvesting of stem cells than their transplantation.

It is suspected that transplanted stem cells develop a multitude of effects via further cell signals, which have received little attention in the past. Latest tests have even shown that adult stem cells can also cause tumours under certain circumstances.

Conclusion:

The General Medical Council Nordrhein cannot recommend an autologous stem cell therapy in illnesses such as

- Amyotrophic lateral sclerosis,
- Alzheimer,
- Arthrosis,
- Diabetes,
- Erectile dysfunction,
- Early-infantile cerebral palsy,
- Cardio-vascular illnesses,
- Macular degeneration,
- Multiple sclerosis,
- Parkinson's disease,
- Apoplexy (stroke) as well as
- Injuries to the spinal cord.