Countless Studies Prove: Stress Strains the Heart and Circulation.

By: Erich Lederer

The typical cold sore on the lip is a sure sign that once again the body has copped too much. It's not always only strains on the muscles or of the circulation system to which the organism responds with stress symptoms, but all too often responds as such to mental stress at work or in the family as well. The virus' work on the lip shows that the immune system, although responding effectively over the short term to threats from the outside, buckles when under chronic overload. The connections between the psyche and the body's defence system are thus far however only roughly understood.

Virus infection strikes at the mind

Psychoneuroimmunology is a relatively young science that many conservative physicians dismiss as an institutionalised form of half-knowledge. It looks at how there are more and more strong indications of how intensively the brain and the body's defences against infection interplay. Patients with multiple sclerosis often break off their interferon therapy because they note disturbances in their own memory and thinking power. Among patients with chronic hepatitis, increased cytokine levels are associated with memory and learning problems. What's more, a few years ago an American research group found indications that viral infections are not only associated with mood swings, but possibly even with serious depression and suicide attempts. And conversely, the immune system of people with post-traumatic stress disorder is often significantly weakened.

An important role in the supply network between the nervous system and the body's defence system is taken up by the stress hormone cortisol. A Canadian study showed about five years ago that children who have been abused in early life later on build fewer receptors for this hormone. As a result the body no longer manages well enough to regulate inflammatory responses and to shut them down when needed.

Friendships are anti-inflammatory drug

Steven Cole of the University of California in Los Angeles is especially interested in the gene expression patterns of people with emotional highs and lows, not short-term mood swings but chronic psychological stress, or situations where one is at peace with oneself. Therefore in people for example who feel lonely over an extended period of time there are many inflammatory genes switched on. Things appear to be rather different with regard to 200 genes in subjects who are well connected and have many acquaintances.

So while stress leaves a distinct mark on hormone levels as well as on gene expression, this medical matter of happiness is a little more complicated. Already about ten years ago Carol Ryff and her colleagues at the University of Wisconsin showed with a group of older women that the level of satisfaction in their lives is reflected in cortisol levels. Among them Ryff found less proinflammatory cytokine and matched to this was a lower risk of cardiovascular disease. Their sleep also was of significantly better quality with longer REM phases. Optimists, as Suzanne Segerstrom from the University of Kentucky found out, have a particularly good immune system. Vaccinations hit the mark with them better than with melancholy people.

Having purpose in life makes for antibodies

Steven Cole teamed up some years ago with the "happiness researcher" Barbara Fredrickson from North Carolina to study at the genomic level in more detail the relationships between happiness and the body's defence against infection. Together they published in summer last year a much-cited report in the prestigious journal PNAS: "A functional genomic perspective on human well-being".

Fredrickson and Cole looked for 80 participants for their study and surveyed them intensively on what provided their lives with moments of happiness. They distinguished two types of good feelings: on the one hand, the hedonistic pursuit of satisfaction, such as sex or a good meal, on the other hand the questionnaire was particularly supposed to reveal eudaemonic people who see happiness in a higher goal as part of a fulfilled life involving a loving exchange with others. Depending on how the answers turned out, these two types of well-being were also able to be found in the switched-on genes.

While participants with a strong eudaemonic tendency showed a strong immune defence in their genetic profile with active antibody production, these factors were rather weakly pronounced among the hedonists. Here inflammatory genes mainly dominated the picture, which barely made an appearance in the other group. Factors for fighting viral attacks, such as Type 1 interferon, were more likely to be found in the eudaemonic group. In the studied group, there were no participants who were completely foreign to either hedonism and eudaemonia, but the proportions were present in varyingly degrees. The differences in gene expression were found most clearly with those who had the most pronounced deflection to the one or the other side.

Effective wound healing for the loner

In their studies in 2010 another American group found that alongside eudaemonic happiness the risk of Alzheimer's disease is seen to decrease. Also, the risk of stroke and premature deterioration of memory is the lowest among those who see very special purpose in their lives.

The outcome of these studies with a rather low number of participants is not the emergence of undeniable causality. Does an alert immune system provide happiness, or vice versa? From the perspective of evolution, the close connection between a fulfilled social life and strong immunological defence could be important for the survival of a human. In a group with close interconnectedness, infections constantly threaten the health of their members. Therefore such a social human group needs sharp weapons for use against microbes. For the loner without social bonds however, the risk of injury in the wilderness in which early humans lived was significantly greater. Thus the importance of increased inflammatory factors, so that such an injury soon healed. It was not until recent times, speculates Jo Marchant in his article published in Nature on November 2013, that the healing-inducing inflammatory factors were converted into a chronic burden via stress. Permanent mental stress without balancing things out with the family or friends strikes the heart and circulatory system, thus producing the well-known civilisation-based illnesses. Still, there are some critics who want to derive no general conclusions from these experiments. Also, a confirmation of Cole's little pool of results is at this point still pending.

Anti-stress training in the fight against cancer

Good stress management can save lives. This is also proven in a study by Michael Antoni from Miami / Florida. In women with early stage breast cancer, a 10-week anti-stress course switched off inflammation and metastasis genes far more effectively than a one-day education seminar. Conversely the stress training produced high-level expression of genes for type I interferon, which is essential for

a strong tumour-immune defence. “If we change the psyche”, as Antoni in his observations comments, “the physiology reacts in parallel”.

Changing the psyche: this even works according to data from Christian Schubert of the University of Innsbruck via suggestion. In patients with genital herpes some are able under hypnosis to increase the number of their NK (natural killer) cells and thus alleviate the disease symptoms. The meaning the psyche holds for a healthy body is also symbolised in the statement by Peter Henningsen, Director of the Clinic for Psychosomatic Medicine and Psychotherapy, TU Munich: “Social relationships are much more important than, say, the question of how to nourish oneself, for the sake of health”.