Psoriasis medication rises hope in the fight against multiple sclerosis

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Fumaric acid salts have been in use against severe psoriasis for a long time. About ten years ago, researchers in Bochum speculated that they may also have a favourable effect on Multiple Sclerosis (MS) as a result of their TH2 polarizing mechanisms. In parallel to phase III studies, research is actively searching for the precise effective mechanisms. This has now been achieved by a neuroimmunological group at Bochum: fumaric acid salts detoxify radicals released during the inflammation process. In this way, they protect nerve and glial cells. Neurologists at the Ruhr University Hospital, St. Josef Hospital, working with Prof. Dr. Ralf Gold report early online in the leading neurology journal *BRAIN*.

Previous history. inspiration from dermatology

Like Multiple Sclerosis, psoriasis is an auto-immune disease, in which the immune system attack the body's own cells. In MS, the "insulating myelin layer" of the axons is destroyed in this way. About ten years ago, the RUB dermatologist Prof. Peter Altmeyer informed his colleague, the neurologist Prof. Horst Przuntek, that the mixture of fumaric acid salts registered for treatment of psoriasis under the trade name FUMADERM could possibly exert favourable effects in MS as well. In turn, the Swiss manufacturer Fumapharm sponsored a small study in Bochum. Ten patients were examined for a period of 48 weeks (Schimrigk et al European Journal of Neurology 2006, 13: 604). In Parallel to this, Fumapharm supported basic research which Prof. Gold then performed at his MS Institute in Göttingen (Schilling et al. Clin Exp Immunology

2006; 145: 101-107).

Fumaric acid salts detoxify radicals and protect nerve cells

After that, the scenario moved rapidly: the US pharmaceutical company BiogenIdec with its focus in MS research took over Fumapharm AG and initiated a successful Phase II study (Kappos, Gold, Lancet 2008; 372: 1463□□). Parallel to this, the group around Prof. Gold, who had moved to Bochum in the meantime, intensively studied the effective mechanisms. It was seen that the effect of the fumaric acid salts, unlike that of "standard medications" against MS, is not merely based on the suppression or the modulation of the immune system, but detoxifies damaging "oxidative radicals" released during the inflammation processes and thus supports the survival of nerve cells. The Nrf2 transcription factor plays a central role in this context. "In this way, fumaric acid assumes a special position in the MS world as a "neuro-protective/antioxidant substance", Prof. Gold explains.

Results of new study are being expected in summer 2011

An international, placebo-controlled, blind study (DEFINE, Sponsor: BiogenIdec) with 1,200 MS patients and the fumaric acid salt BG12 has just been completed under the leadership of Prof. Gold. Evaluation is being expected for summer 2011. "If the study is successful, one could easily imagine that the antioxidant effect of the fumaric acid also synergizes with established MS medication such as interferon-ß thus forming an ideal combination therapy", Prof. Gold speculates. "This is significant insofar as both fumarates as well as interferon do not contain any long-term risks according to the current state of knowledge – unlike many modern strong MS therapies."

More information: R. Linker, R. Gold et. al.: Fumaric acid esters exert neuroprotective effects in neuroinflammation via activation of the Nrf2 antioxidant pathway. In: Brain 2011: 134; 678, doi:10.1093/brain/awq386