

## HEALTH

### Israeli MS patients in adult stem cell first [VIDEO]

By ISRAEL21c staff December 25, 2007

Scientists based at Jerusalem's Hadassah University Hospital have broken new ground in the field of stem cell research by injecting sufferers of neurological diseases with therapeutic quantities of cultured adult stem cells.

The Hadassah neurologists, working under the guidance of team leaders Professor Dimitrious Karussis and Prof. Shimon Slavin, the recently retired head of Hadassah's bone marrow unit, extracted stem cells from the hip bone marrow of 26 multiple sclerosis (MS) and amyotrophic lateral sclerosis (ALS) patients. After a two-month long process of *in vitro* cleansing, multiplication and chemical 'tagging', the cells were re-injected into the patients via lumbar puncture.

According to Karussis, the trials were the first in the world to use this type of stem cells.

"The sole aim of this study was to explore the feasibility and the safety of this treatment, since it is applied for first time," Karussis told ISRAEL21c.

No adverse effects were noted, and the experiment was deemed a success. Even more encouragingly, patients also displayed anecdotal improvements in clinical symptoms, leading the way for further developments in forthcoming clinical trials.

"Most MS patients reported a stabilization of their condition and some an improvement in function, especially in sphincter control, muscle power in arms, tremor and stability in walking," Karussis said. "ALS patients continued to show signs of deterioration - though at a lesser than previous degree."

For both groups of patients, any such news is good news. MS, which affects over 2.5 million people worldwide, causes damage to the body's central nervous system - the brain and spinal cord - and results in impaired sensory, motor, balance and vision function. The rarer, more rapidly progressing ALS, also known as Lou Gehrig's disease, involves a similar degeneration of neuronal cells, causing the gradual and fatal loss of the patient's capacity for movement.

Because both diseases are caused by the deterioration of a specific type of cell, they are prime targets for stem cell treatment.

In extensive experimentation on animal models of MS and ALS, the Hadassah researchers found that transplanted adult stem cells began to differentiate into the kinds of cells which the diseases had destroyed, suggesting that it might be possible to regenerate damaged nervous systems through cell re-growth.

After the equivalent of one or two years in the human progression of the diseases, the treated lab mice retained 90 percent of their neurons, despite suffering from a similar motor neuron disorder.

The most recent safety study, says Karussis, marks the first time that such adult stem cells have been injected into human patients. Although the small-scale study lacked a control group, and thus remains highly experimental, it has paved the way for a larger efficacy trial to be held over the course of the next few years.

"We are encouraged as these are patients with advanced cases, many of them in wheelchairs," Karussis told the *Jerusalem Post*.

The research, the scientists say, is significant since most attention in recent years has been paid to therapies using embryonic, rather than mature, stem cells. But unlike embryonic stem cells, this kind of therapy offers practical advantages because the patient can serve as his or her own donor, significantly reducing the chances of immune system rejection.

Such an approach also avoids the complex ethical issues invoked when stem cells are obtained from embryonic sources.

The researchers hope to enlarge the safety study to include more patients, and then launch a controlled clinical trial of the therapies. They are happy to receive applications from possible participants, they say.

In the meantime, however, the group must first obtain funding to cover the expense of clinical treatment - up to \$20,000 per patient - and must receive a license from the Ministry of Health, which may prove a lengthy process. Such hurdles are significant - but the benefits, say the team, will be worth it.

Stem cells, Karussis notes, "have already shown some promise in the treatment of joint and bone diseases, immune conditions and ischemia of the heart." And he is optimistic, he says, that MS and ALS will join that auspicious list one day "not far into the future."

