Listening to music improves stroke patients' recovery

February 20 2008

Listening to music in the early stages after a stroke can improve patients' recovery, according to new research published online in the medical journal *Brain* today.

Researchers from Finland found that if stroke patients listened to music for a couple of hours a day, their verbal memory and focused attention recovered better and they had a more positive mood than patients who did not listen to anything or who listened to audio books. This is the first time such an effect has been shown in humans and the researchers believe it has important implications for clinical practice.

-As a result of our findings, we suggest that everyday music listening during early stroke recovery offers a valuable addition to the patients' care- especially if other active forms of rehabilitation are not yet feasible at this stage-by providing an individually targeted, easy-to-conduct and inexpensive means to facilitate cognitive and emotional recovery, says Teppo Särkämö, the first author of the study.

Särkämö, a PhD student at the Cognitive Brain Research Unit, Department of Psychology, at the University of Helsinki and at the Helsinki Brain Research Centre, focused on patients who had suffered a stroke of the left or right hemisphere middle cerebral artery (MCA). He and his colleagues recruited 60 patients to the single-blind, randomised, controlled trial between March 2004 and May 2006 and started to work with them as soon as possible after they had been admitted to hospital.

-We thought that it was important to start the listening as soon as possible during the acute post-stroke stage, as the brain can undergo dramatic changes during the first weeks and months of recovery and we know these changes can be enhanced by stimulation from the environment, Särkämö explains.

Most of the patients had problems with movement and with cognitive processes, such as attention and memory, as a result of their stroke. The researchers randomly assigned them to a music listening group, a language group or a control group. During the next two months the music and language groups listened daily to music they chose themselves (in any musical genre, such as pop, classical, jazz or folk) or to audio books respectively, while the control group received no listening material. All groups received standard stroke rehabilitation. The researchers followed and assessed the patients up to six months post-stroke, and 54 patients completed the study.

-We found that three months after the stroke, verbal memory improved from the first week post-stroke by 60 percent in music listeners, by 18 percent in audio book listeners and by 29 percent in non-listeners. Similarly, focused attention-the ability to control and perform mental operations and resolve conflicts among responses-improved by 17 percent in music listeners, but no improvement was observed in audio book listeners and non-listeners. These differences were still essentially the same six months after the stroke, Särkämö says.

In addition, the researchers found that the music listening group experienced less depressed and confused mood than the patients in the control group.

-These differences in cognitive recovery can be directly attributed to the effect of listening to music, says Särkämö. -Furthermore, the fact that most of the music (63 percent) also contained lyrics would suggest that it

is the musical component (or the combination of music and voice) that plays a crucial role in the patients' improved recovery.

-I would like to emphasise the fact that this is a novel finding made in a single study that is promising but will have to be replicated and studied further in future studies to better understand the underlying neural mechanisms. Since the result is based on a group study, I would also caution people not to interpret it as evidence that music listening works for every individual patient. Rather than an alternative, music listening should be considered as an addition to other active forms of therapy, such as speech therapy or neuropsychological rehabilitation, Särkämö continues.

The researchers say there may be three neural mechanisms by which music could help to stroke patients to recover:

- Enhanced arousal (alertness), attention and mood, mediated by the dopaminergic mesocorticolimbic system-the part of the nervous system that is implicated in feelings of pleasure, reward, arousal, motivation and memory;

- Directly stimulating the recovery of the damaged areas of the brain;

- Stimulating other more general mechanisms related to brain plasticity – the ability of the brain to repair and renew its neural networks after damage.
    - Other research has shown that during the first weeks and months after stroke, the patients typically spend about three-quarters of their time each day in non-therapeutic activities, mostly in their rooms, inactive and without interaction, even although this time-window is ideal for

rehabilitative training from the point of view of brain plasticity. Our research shows for the first time that listening to music during this crucial period can enhance cognitive recovery and prevent negative mood, and it has the advantage that it is cheap and easy to organise, Särkämö concludes.

Source: University of Helsinki