Cholesterol-lowering drug boosts bone repair

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Lovastatin, a drug used to lower cholesterol and help prevent cardiovascular disease, has been shown to improve bone healing in an animal model of neurofibromatosis type 1 (NF1). The research, reported today in the open access journal *BMC Medicine*, will be of great interest to NF1 patients and their physicians.

Many NF1 patients suffer from bowing, spontaneous fractures and pseudarthrosis (incomplete healing) of the tibias (shinbones). Mateusz Kolanczyk from Stefan Mundlos' laboratory in the Max Planck Institute for Molecular Genetics, Berlin, led a team that investigated lovastatin's ability to prevent pseudarthrosis in a new animal model of human NF1 disease.

Current therapies are often futile when applied to pseudarthrosis of the tibia; in some cases, amputation is the only option. To better understand this problem, Kolanczyk and his colleagues developed this mouse model. He said, "In our model, the mice showed tibial bowing similar to that observed in NF1 patients, however since mouse legs are not subjected to the same excessive mechanical forces as humans, we also applied a bone injury model". The authors drilled a 0.5mm hole in the tibia of anaesthetised mice. As they describe, "This enables analysis of the complex process of bone repair while at the same time causing the least possible distress to the animals".

The process of bone repair was examined 7, 14 and 28 days post-injury. The authors found that the mice given the statin treatment had marked improvements in bone healing compared to the control animals. As they

report, "Lovastatin appears to accelerate cortical bone repair primarily by enhancing new bone formation within the bone marrow cavity and by replacing fibro-cartilaginous tissue in the injury site with mineralised bone matrix".

Kolanczyk concludes, "Our results suggest the usefulness of lovastatin, a drug approved in 1987 for the treatment of high cholesterol, in the treatment of neurofibromatosis-related fracture healing abnormalities". The experimental model presented here constitutes a valuable tool for the preclinical testing of other candidate drugs that target similar bone problems.

Source: BioMed Central