

Mobile MRI tracks effects of long-distance running

By Sara J. Martinez | 29. November 2010

Athletes are known for playing through injuries, and a new study presented Monday at the RSNA annual meeting says that sometimes it's safe for them to push through pain.

Researchers reported the effects of long-distance running on the body by using a mobile MRI truck to follow runners across Europe for two months in the 4488-kilometer TransEurope Foot Race. Over the course of the 64-day long-distance race, researchers collected daily urine samples and biometric data as well as blood samples from 22 of the 66 runners. Participants underwent an MRI exam every three or four days.

The study found athletes lost body volume and body fat and their leg muscles degenerated over time because of their immense energy consumption.

"Our primary work was the MRI," said Dr. Uwe Schütz, a specialist in orthopedics and trauma surgery in the diagnostic and interventional radiology department at the University Hospital of Ulm in Germany. "We were able to do 10 to 12 MRI examinations a day."



An athlete enters MRI unit on the mobile truck that followed runners along the 4488-kilometer TransEurope Foot Race. (Provided by RSNA)

MR images of the runners' bodies showed they lost an average of 5.4% body volume from start to finish, most of which took place in the first half of the race. Schütz said men lost about 5 kg of body fat during the race.

Nearly all runners had some problem with their legs, including muscle and tendon inflammation.

"Reasons for giving up the race and not finishing were twofold," Schütz said.

"Mostly severe and recurrent overuse and inflammation of soft tissue in the legs."

But Schütz said these runners handled pain differently than most nonrunners or recreational runners, and many would not give up.

"These athletes have a significantly different pain perception than normal people and a strikingly high pain level," he said. "If they get problems in their body, they will not stop because they want to finish. They will run through the pain."

Some pain is OK to run through, and Schütz said pushing through pain from soft tissue inflammation has no lasting effects.

"The rule that 'if there is pain, you should stop running' is not always correct," Schütz said. "It's necessary to find the reason for pain, and you don't have to tell the runner 'You have to stop.'"

MRI scans also showed a reduction of more than 5% of brain volume during the course of the study, Schütz said. The main loss of volume was in the region of the brain where areas of optical associations are located, but subjects tested later found their brains had gone back to normal.

Schütz said this could have been because the course went through a forest for four weeks of the race.

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"We think that the optical area wasn't needed at this time," he said. "It was very monotone, so maybe the body has a tendency to decrease in this area because it's not needed."

The study also found the first tissue affected was visceral fat, and visceral fat loss occurred earlier in the process than previously thought. Fat reduction is more pronounced in people as they begin running rather than in those who've been running for a long time, Schütz said.

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