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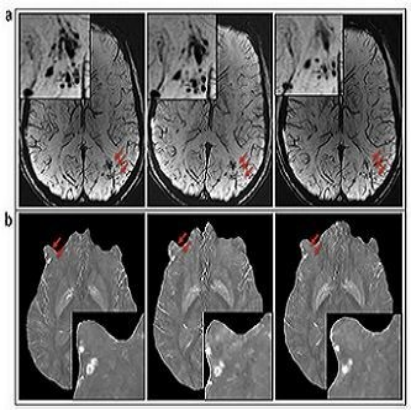
# MRI Improves Diagnosis of Microbleeding after Brain Injury




A new study in the journal *Radiology* suggests that imaging patients soon after traumatic brain injury (TBI) occurs could help to detect cerebral microhaemorrhages more accurately. Researchers used susceptibility-weighted imaging — an MRI technique that provides improved visibility of blood and is highly sensitive to haemorrhage — to evaluate U.S. military service members with TBI.

Cerebral microhaemorrhages (microbleeding on the brain) occur as a direct result of TBI and can lead to severe secondary injuries such as brain swelling or stroke. The Institute of Medicine reports that 20 to 23 percent of military service members deployed to Afghanistan and Iraq have sustained TBI while serving.

“TBI is a large problem for our military service members and their families,” says Gerard Riedy, MD, PhD, chief of neuroimaging at the National Intrepid Center of Excellence at the Walter Reed National Military Medical Center in Bethesda, Md. “We found that many of those who have served and suffered this type of injury were not imaged until many, many months after injury occurred thus resulting in lower rates of cerebral microhaemorrhage detection which delays treatment.”

Dr. Riedy and colleagues used susceptibility-weighted imaging to evaluate 603 military personnel with TBI. Of the 603, seven percent were found to have at least one occurrence of cerebral microhaemorrhage.

The patients were divided into four groups based on time since the injury occurred, ranging from less than three months to over a year. Cerebral microhaemorrhage was identified in 24 percent of military personnel who were imaged within three months post-injury, compared to 5.2 percent of the patients who were imaged over a year later. The researchers attribute this to changes in iron deposits in the brain as time goes on, making it more difficult to detect microbleeding.

“Early characterisation of cerebral microhaemorrhages may help to explain clinical symptoms of acute TBI and identify the severity of brain damage,” Dr. Riedy points out. “We believe that having access to MRI in the field would facilitate early detection of TBI, thus providing timely treatment.”

The study also supports previous claims that using susceptibility-weighted imaging to evaluate brain injury patients may be more effective than conventional MRI. According to the results, 77 percent of cerebral microhaemorrhages appeared more evident through susceptibility-weighted imaging when compared to conventional MRI.

**Top image.** A, susceptibility-weighted imaging and, B, quantitative susceptibility mapping images show the evolution of microhaemorrhages (arrows) in a patient who underwent follow-up imaging.

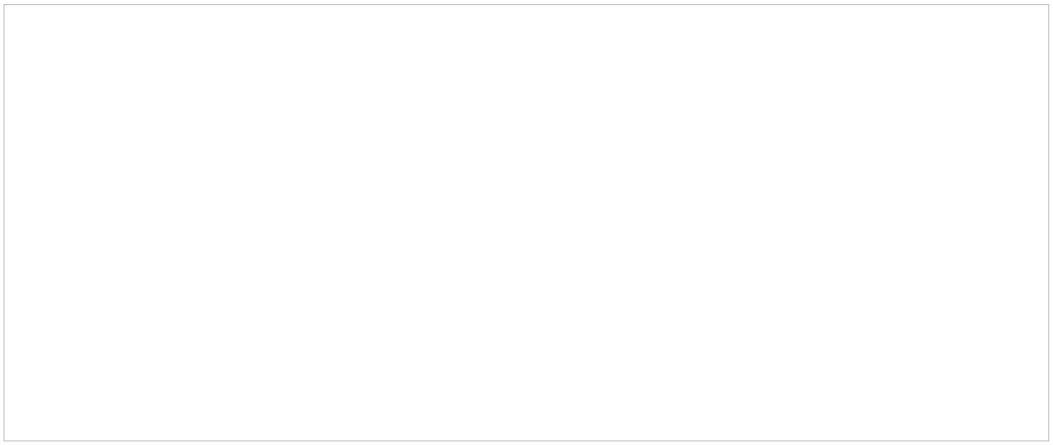


**Figure 1.** A, gradient-recalled-echo (GRE), B, susceptibility-weighted imaging (SWI), and, C, quantitative susceptibility mapping (QSM) images in a patient with traumatic brain injury. The arrows indicate a cerebral microhaemorrhage (CMH) that is visible on SWI, GRE, and QSM images. The arrowheads indicate another CMH that is visible on SWI and QSM images, but not the GRE image. ppb = parts per billion.

Source and image credit: RSNA

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