A recent study in the United States revealed that more than half of US Army veterans suffer from auditory processing disorder (APD), a hearing problem that affects the ability to distinguish between competing sounds. It is particularly an issue when trying to focus on someone speaking in a noisy environment, such as a pub or a busy street. Sufferers have difficulty making out the human voice against conflicting background noise.

Now research is under way to investigate how many veterans in the UK have APD, and to investigate possible treatments for it. And that’s where the readers of Legion come in.

Dr Tobias Reichenbach, a scientist with a background in auditory neuroscience who is leading the UK project, says: “The US research shows that APD can be a consequence of blast exposure, and many veterans who have been in a combat situation have experienced blast exposure. We ask any former Service personnel under the age of 50, men and women, to contact us and help us with our research. They don’t have to recognise the symptoms of APD.”
APD in themselves, just to have experienced blast exposure. We want to know how much of a problem it is among veterans in the UK."

How blasts affect the brain
According to Tobias, blasts have a severe effect on our neural mechanisms. "APD isn’t a result of damage done to the ear, which can be in perfect working order," he says. "It’s due to neurological impairment. With a blast, a blast wave goes over you, and that has impact on the head. Also people can be thrown against a wall or hit on the head, causing injury to the brain. However, we need to find out what kind of injury has occurred and to what extent. In one person it might be the brain stem that’s damaged and in another it could be impairment to the cortical function. We’re at the first stage of the research and it is all pretty much unknown."

This investigation into APD and a possible remedy would not be possible without The Royal British Legion, who provided the funding for the three-year project as part of its work at the Centre for Blast Injury Studies. The centre was founded by the Legion at Imperial College London with an £8 million grant nearly four years ago. "It’s because of the Legion that this is happening," says Tobias. "APD is a common problem among veterans, but I don’t think it’s really been picked up before because it’s not fatal. However, a loss of hearing in any capacity can have a significant impact on your professional and personal life."

Assessing the damage
The technique used in the APD research is electroencephalography, or EEG, an established diagnostic measurement of brain activity. Each subject will be asked to wear a cap fitted with electrodes and to listen to two competing human voices through a set of headphones. The electrodes on the cap will then track the signals from the brain that are used to understand speech.

"There will be different outcomes depending on the impairment," says Tobias. "At the moment there is no treatment available, but we hope to change that. Some people are born with APD and in those people it is difficult to cure. In veterans it has been acquired so we are hoping it can be reversed through auditory training, such as brain stimulation, which involves applying small currents to the brain and to make the brain able to learn more easily. It would be a painless and effective form of rehabilitation, but it’s important to know more specifically how APD works so we can fine-tune the rehabilitation. The more people who come forward to help us with our research, the sooner we will be able to find a treatment."