

Beta-blockers tackle memories of horror

Could a common drug be able to extinguish the trauma associated with horrific memories?

A group of US psychiatrists thinks it can. They claim that beta-blockers, which are widely used to treat high blood pressure and heart problems, interfere with the way that the brain stores memories. Administer these drugs at the right time, the psychiatrists suggest, and sufferers of post-traumatic stress disorder (PTSD) could snuff out the periods of panic that blight their lives.

The idea is timely, yet controversial. Studies of terrorist attacks suggest that the recent bombings in London and Egypt will cause a spike in the number of cases of PTSD (see 'The long-term toll of terrorism'). Treatments such as counselling have limited success, so alternatives are welcome. But some mental-health experts say that the treatment could be abused, perhaps by military commanders who want soldiers to become desensitized to terrible acts.

The beta-blocker idea was inspired by the discovery in the past decade that memories are surprisingly pliable. Some drugs, for instance, can interfere with a memory when it is recalled, such that an altered version is put back in storage. The beta-blocker propranolol is one example. It blocks the neurotransmitters involved in laying down memories, and studies have found that rats who have learned to fear a tone followed by an electric shock lose this fear if propranolol is administered after the tone starts¹.

A group of New York-based psychiatrists has produced similar results in humans, *Nature* has learned. They plan to submit their work for publication in September, but have already started work on a clinical trial of propranolol in PTSD patients. Roughly one in three people caught in events such as terrorist attacks will suffer PTSD symptoms: panic attacks and flashbacks that are triggered by events associated with memories of the trauma, such as sirens or bangs.

"The memory of the event is associated with the fear and they always occur together," says Margaret Altemus, a psychiatrist at Cornell University who is working on the clinical trial.

Breaking the cycle

Altemus and her colleagues ask their subjects to take a dose of propranolol whenever they feel the characteristic symptoms of PTSD, such as rapid heart rate or troubled breathing. If the theory is right, the trauma memory should be pliable at that point. And propranolol should break the link between recall and fear.

The team wants 60 subjects, but has managed to recruit just one a month since work started in February. Altemus says many PTSD sufferers are reluctant to enrol in an experimental programme when established treatments are already available. In exposure therapy, for example, subjects recall the traumatic event and then try to calm the memory



IMAGE
UNAVAILABLE
FOR COPYRIGHT
REASONS

by thinking of happy experiences.

This is probably the best treatment available at present, but such therapies benefit only two-thirds of patients. And some PTSD sufferers, notably those who experienced sexual abuse, are reluctant to actively recall their memories.

The long-term toll of terrorism

ABC/APTN/AP

Just weeks after the terrorist attacks of 11 September 2001, psychiatrists were busy uncovering the psychological impact of the disaster. Thanks to their work, and to studies on Palestinian attacks in Israel and Islamic terrorism in France, scientists in Britain and Egypt know how this month's bombings are likely to affect people.

Terrorist attacks often take a greater toll than do other traumatic events, such as accidents, because there is more panic, and explosions expose people to gruesome disaster scenes. When psychiatrists in Israel compared survivors of terrorist attacks and traffic accidents, for

example, they found that almost 40% of the former developed post-traumatic stress disorder (PTSD), around twice the number of cases in the accident victims².

Few other studies have made such comparisons, but much is known about survivors of terrorism. Last year, psychiatrists in France published a study³ of survivors of the Islamic terror attacks of 1995

and 1996. Around a third suffered from PTSD two to three years after the event. Women were more likely to be affected than men, as were those who suffered severe initial injuries.

Other PTSD studies are more controversial. After the 2001 attack on the World Trade Center

(pictured), US researchers used telephone interviews to assess the event's impact on university students⁴. They found a high level of PTSD — around 30% — on one campus close to New York City. This elevated figure was linked to the amount of television coverage of the event that individuals had watched.

Such results have since been criticized by researchers who feel that the diagnosis of PTSD should be restricted to those who suffer severe and disabling reactions to memories of an event. Some psychiatrists point out that many people temporarily experience isolated symptoms of PTSD after a traumatic event, such as feeling jumpy or wanting to avoid the affected place. PTSD sufferers, in contrast, suffer for prolonged periods of time. J.G.

IMAGE
UNAVAILABLE
FOR COPYRIGHT
REASONS

Traumatic events may trigger panic in the years that follow, but there is hope for a simple drug therapy.

Given these limitations, the propranolol study is welcomed by other PTSD researchers. But some caution that a focus on a single drug may obscure other problems. "We hope it will work, but it's a simple solution," says Berthold Gersons, a psychiatrist at the University of Amsterdam in the Netherlands.

He recounts how he treated the insomnia suffered by the survivor of a fire in a crowded party on New Year's Eve. After several sessions of therapy, Gersons discovered that his patient was subconsciously listening for a sound he had heard during the fire: the noise of air being sucked into the blaze. As the survivor was not aware he was doing this, and did not initially recall the memory, Gersons questions how propranolol would have helped him.

Altemus acknowledges that her treatment will not work in every case, and adds that all trial participants will be given other help with PTSD, such as breathing exercises.

Some researchers have objections that may be harder to deal with. They argue that aspects of PTSD are a natural response to traumatic events and should not be treated with drugs.

"If soldiers did something that ended up with children getting killed, do you want to give them beta-blockers so that they can do it again?" asks Paul McHugh, a psychiatrist at Johns Hopkins University in Baltimore, Maryland, and a member of the US President's Council on Bioethics. "Psychiatrists are once again marching in where angels fear to tread."

Altemus rejects such charges. She says that propranolol should lessen the panic and flashbacks associated with a memory, but will not remove it altogether. With the memory still in place but the trauma dimmed, individuals should be better equipped to make moral judgements about the event.

"People with PTSD are disabled — their communication and relationships can be crippled," she adds. "It's a serious illness." ■

Jim Giles

1. Debiec, J. & Ledoux, J.E. *Neuroscience* **129**, 267-272 (2005).
2. Shalev, A.Y. & Freedman, S. *Am. J. Psychiatry* **162**, 1188-1191 (2005).
3. Verger, P. et al. *Am. J. Psychiatry* **161**, 1384-1389 (2004).
4. Blanchard, E.B. et al. *Behav. Res. Ther.* **42**, 191-205 (2004); **43**, 143-150 (2005).