

Abstract Post-Traumatic Stress Disorder (PTSD) is a complex psychiatric condition, the effects of which can be seriously debilitating. Emotional harm has been defined as including "distress [...] anxiety, diminished enjoyment, loss of autonomy, and similar intangible harms".

**Section snippets**

**The origin of PTSD: a brief history** PTSD was a source of controversy long before its first appearance in the third edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980. The alleged presence of the disorder has been reported in past centuries. The British Journal of Psychiatry, for instance, described how the Diary of Samuel Pepys<sup>3</sup>

**The state of the art**

**Neuroimaging** is mainly composed of three different techniques: functional Magnetic Resonance Imaging (fMRI), Positron Emission Tomography (PET), and Single Photon Emission Computed Tomography (SPECT) (Francati, Vermetten, & Bremner, 2007). All of these techniques measure signals that have to do with variations in the regional Cerebral Blood Flow (rCBF). When a region of the brain is more active than a baseline, it consumes more energy and recruits more blood. Even though the correlation is not

**PTSD in court** The assessment of PTSD in court has great importance both in criminal and civil trials. In the former case, it might lead to the solution of a case, because the presence of PTSD can be considered as evidence that a criminal act (the traumatic event, such as a rape) has indeed occurred.<sup>6</sup>

In civil cases the presence of a psychological trauma is crucial in order to

**Neuroscientific evidence of PTSD in civil and tort law** The chances offered by science to assess the presence of a disease have led to the increased use of experts in the courts of law. The British Psychological Society defines an expert as "a person who through special training, study or experience, is able to furnish the Court, tribunal, or oral hearing with scientific or technical information which is likely to be outside the experience and knowledge of a judge, magistrate, or jury."<sup>23</sup>

**Conclusions** Starting from the analysis of the recent Georgopoulos and colleagues' experiments, targeted to find a biomarker for Post Traumatic Stress Disorder, we have explored the relationships between neuroscience, PTSD, and law.

**Introduction**

**Post-Traumatic Stress Disorder (PTSD)** is defined by four main symptoms: (1) re-experiencing of painful memories, (2) effortful avoidance of trauma cues, (3) emotional numbing, and (4) hyper-arousal. Two of the most recurrent findings in PTSD patients are decreased medial prefrontal cortex (MPFC) and increased amygdala activation. In 2010, however, the team led by A. Georgopoulos at the University of Minnesota used MagnetoEncephaloGraphy (MEG) to directly measure the magnetic fields produced by electrical activity in the brain of PTSD-affected war veterans and healthy controls. Neuroscience is slowly discovering the neural bases of PTSD and other psychiatric ailments and is building tests to distinguish actual patients from non-suffering individuals. It is currently one of the most frequently litigated mental diseases.