

# The relationship between the First World War and neurology: 100 years of “Shell Shock”

A relação entre a Primeira Guerra Mundial e a neurologia: 100 anos do “Shell Shock”

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## ABSTRACT

The First World War was a global war, beginning on 28 July 1914, until 11 November 1918. Soon after the beginning of the war, there was an “epidemic” of neurological conversion symptoms. Soldiers on both sides started to present in large numbers with neurological symptoms, such as dizziness, tremor, paraplegia, tinnitus, amnesia, weakness, headache and mutism of psychosomatic origin. This condition was known as shell shock, or “war neurosis”. Because medically unexplained symptoms remain a major challenge, and considering the close relationship of symptoms described in shell shock with clinical neurology, we should study their history in order to improve future care.

**Keywords:** First World War; shell shock; combat disorders.

## RESUMO

A Primeira Guerra Mundial foi uma guerra global, iniciada em 28 de julho de 1914, até 11 de novembro de 1918. Logo após o início da guerra, exatamente há 100 anos, houve uma “epidemia” de sintomas neurológicos conversivos. Soldados de ambos os lados começaram a apresentar com frequência sintomas neurológicos, tais como: tontura, tremor, paraplegia, zumbido, amnésia, fraqueza, cefaleia e mutismo de origem psicossomática. Esta condição ficou conhecida como shell shock, ou “neurose de guerra”. Como muitos sintomas e doenças inexplicadas continuam sendo um grande desafio, e considerando a estreita relação dos sintomas descritos no shell shock com a neurologia clínica, torna-se importante estudar essa parte da história com o objetivo de entendermos e melhorarmos os cuidados aos pacientes.

**Palavras-chave:** Primeira Guerra Mundial; shell shock; distúrbios de guerra.

The First World War (also known as World War I or the Great War) was a global war, beginning on 28 July 1914, until 11 November 1918. This large conflict involved countries that organized themselves in two opposing lines: the Allies or Triple Entente (including the United Kingdom, France and Russia), versus the Central Powers or Triple Alliance (Germany and Austria-Hungary). Although Italy was a member of the Triple Alliance, these alliances reorganized and expanded as more nations entered the war: Italy, Japan and the United States joined the Allies, while the Ottoman Empire and Bulgaria joined the Central Powers.

The trigger for the war was the assassination of Archduke Franz Ferdinand of Austria, but other political questions related to the foreign imperialist policies of the great powers of Europe were also at stake. In this Great War, which was one of the largest in history, more than 70 million servicemen,

including 60 million from Europe, were mobilized. With technological advancement and increased lethality of weapons, more than nine million soldiers were killed on battlefields.

Following an initial period of mobile warfare, trench warfare became the dominant setting for the WWI battles at the Western front. The armies protected themselves in extensive lines of earth that were dug by the soldiers (Figure 1). This was the most lethal phase of the Great War. Many soldiers fell victim to shell explosions, machine gun fire, and toxic gas. Hygiene was precarious, trenches were infested with parasites and vermin, and soldiers were constantly exposed to infectious diseases.

Soon after the beginning of the war, soldiers on both sides started to present in large numbers with neurological symptoms, such as dizziness, tremor, tinnitus, amnesia, weakness and headache. Despite the symptoms, many cases

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presented no evidence of physical injury. Many physicians concluded that the intensity of the bombings, the constant sight of dead comrades, and the uncertainty of coming out alive, must have contributed to the reactions of these soldiers<sup>1,2</sup>. This condition was known as “shell shock”, or “war neurosis”, which shares features with (but is not the same) as present-day post-traumatic stress disorder<sup>3</sup>. In his seminal article on shell shock in the *Lancet*, published in 1915, Myers described three soldiers who had suffered vision loss, hearing and smell changes, and memory loss without obvious physical injuries (Figure 2)<sup>4</sup>. It became increasingly clear to physicians in Britain, Germany and other countries that these syndromes bore similarity with the hysterical presentations discussed by Charcot and his colleagues in nineteenth century Paris<sup>3</sup>.

However, not everyone conceptualized shell shock in this functional or psychological way. Several doctors believed in hidden brain injuries and others suspected carbon monoxide poisoning. Some doctors even accused shell shocked soldiers

of malingering and actively trying to avoid their military duty, although actual punishment under military law was rare<sup>3</sup>.

Major Arthur Hurst, a physician with a strong interest in Neurology and good contacts with leading French neurologists, made a major contribution to the understanding and treatment of shell shocked soldiers, Hurst’s description of the clinical phenotype of shell shock was striking<sup>5,6</sup>. Many soldiers had paraplegia, ataxia, tremor, and mutism of psychosomatic origin and others psychogenic movement disorders (Figure 3). Numerous films were produced at the time, one of them by Arthur Hurst himself, in order to demonstrate the successful treatment through hypnotic suggestion and other techniques<sup>7</sup>.

It is very interesting to compare shell shock and other “war syndromes”. In the Persian Gulf War (1990-1991), 25% to 30% of veterans developed a complex syndrome that included chronic fatigue, pain, cognitive and affective dysfunction and other “functional” interoceptive and nociceptive complaints. This syndrome was termed Gulf War Illness (GWI)<sup>8</sup>. There is an ongoing debate on the relative contribution of organic



Figure 1. German battery of chlorine gas cylinders being prepared for an attack, awaiting the right weather conditions to prevent blowback; similar to the arrangement at Hill 60 in May 1915, open domain.

**A CONTRIBUTION TO THE STUDY OF SHELL SHOCK.**  
**BEING AN ACCOUNT OF THREE CASES OF LOSS OF MEMORY, VISION, SMELL, AND TASTE, ADMITTED INTO THE DUCHESS OF WESTMINSTER'S WAR HOSPITAL, LE TOUQUET.**  
 By CHARLES S. MYERS, M.D., Sc.D. CAMB.,  
 CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Figure 2. First article published related to the Shell Shock in the First World War, in 1915, by Dr. Charles Myers, captain – Royal Army Medical Corps, in *The Lancet*. In this paper, Myers described neurological symptoms characterized by vision loss, hearing and smell changes, and memory loss related to the Shell Shock.

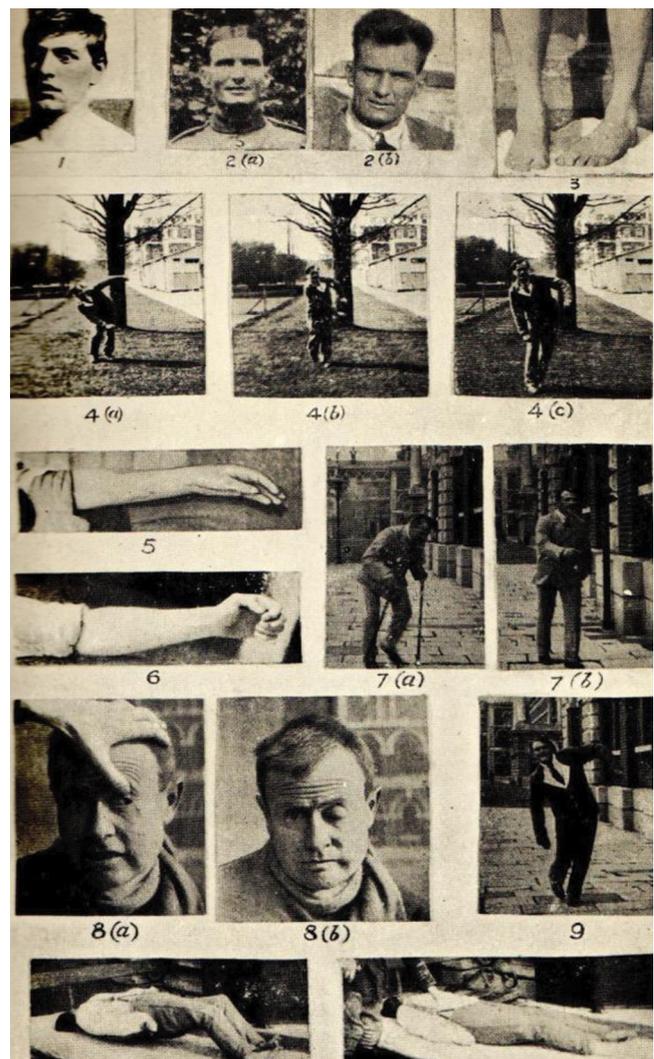


Figure 3. Images of “shell shock”, with different neurological manifestation, scanned from Arthur Hurst’s book: Arthur Hurst, *Medical Diseases of the War* (London: Edward Arnold, 1918).

(particularly toxic) and psychological (combat stress) factors, which is often politically charged, and very similar to the debates around shell shock a century ago.

In France, the most dramatic representation of shell shock was “camptocormie”<sup>9</sup>. The neurologists Achille Alexandre Souques and Inna Rosanoff-Saloff proposed this term characterized by an abnormal position of the trunk with marked flexion of the thoraco-lumbar spine, which increases during walking and abates in the recumbent position. The abnormal posture was assumed to be a psychogenic disorder described as a conversion reaction during the First World War in male military recruits and soldiers who were unable to cope with the stress of combat and unpleasant military life, perhaps triggered by stooped posture when walking in the trenches.

Considering therapeutic options, in 1916, Clovis Vincent, pioneer of neurosurgery in France, developed a method called *torpillage* (a term created by the soldiers themselves with the meaning of torpedoing), a “persuasive” form of psychotherapy using faradic and galvanic electric currents, to treat soldiers with camptocormia and “intractable” neuroses<sup>10</sup>. Electrotherapy was popular for some time during the war in other countries as well, although some forms were banned by the authorities.

A century ago, there was an “epidemic” of neurological conversion symptoms, the condition called shell shock. It is still fascinating for today’s neurologists and psychiatrists to watch the film documentaries and read the detailed case reports, such as those preserved in the archives of the National Hospital at Queen Square in London (Figure 4).



Figure 4. National Hospital for the Paralysed and Epileptic, around 1914, Queen Square Archives, QSA/15445.

Because medically-unexplained symptoms remain a major challenge and, considering the close relationship of symptoms described in shell shock with clinical neurology, we should study their history in order to improve future care.

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