

Review article

Historical documents on epilepsy: From antiquity through the 20th century

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Abstract

Historical documents dating back almost 4500 years have alluded to the condition of epilepsy, describing signs and symptoms that are well-known today. Epilepsy was thought to be a mystical disorder by almost all Ancient cultures, including the Babylonians, Egyptians, Greeks, Indians, Iranians and Chinese. Hippocrates was the first to de-mystify the condition of epilepsy, providing a more scientific approach to the condition. As the signs and symptoms of epilepsy occurred without an obvious cause, the idea stood that it was a mystical phenomenon of divine punishment. This portrayal persisted through the early centuries of the common era, including the Middle Ages. It was not until the 16th and 17th century that *Paracelsus, le Pois* and *Sylvius* started to investigate internal causes for epilepsy. By the beginning of the 18th century, the general opinion on epilepsy was that it was an idiopathic disease residing in the brain and other inner organs. This resulted in *Tissot* writing the first modern book on epilepsy. Research continued in the 19th century with *Jackson* describing different types of seizures and many researchers showing interest in electroencephalography (EEG). The 20th century saw more detailed research being done on epilepsy and EEG, in addition to the establishment of many epilepsy-associated medical societies. The goal of this historical documentation is to provide an overview of the most important milestones in the history of epilepsy.

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1. Introduction

The history of epilepsy is intermingled with the history of human existence, dating back to antiquity. There are few diseases in the history of medicine that can be traced back over thousands of years. Numerous documents, philosophical texts, written evidence and legal references about epilepsy can be found in multiple cul-

tures, including the ancient Babylonians (2000 years B.C.), Egyptians (1700 years B.C.) and Greeks (5–4th century B.C.) [1–3]. References can also be seen in more modern medicine, including: Indian (Ayurveda) [4], Iranian (Avicenna) [5], and Chinese [6]. Over the course of history, epilepsy has been known by a variety of names, such as: sacred disease (Greek: ιερά νόσος), an illness sent by the gods, lunacy (Greek: σεληνιασμός), possession by evil spirits, falling sickness, Valentine's disease and Herakleia (derived from Hercules, who also suffered from it according to the legend) [7,8]. There are numerous Latin synonyms, including morbus:

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herculeus, sacer, divinus, divus, coelestus, comitalis, iudaicus, mensalis and daemonicus [7].

Depending on the era and the prevailing concept of medicine and religion, there were different assumptions about the causes of epilepsy. Basic knowledge of epilepsy was outlined by Hippocrates in Ancient Greece (460–377 B.C.) [9–11]. Up until the 18th century, epilepsy was still considered an idiopathic disease derived from the brain. The work of *William Cullen* and *Samuel A. Tissot* set the basis for the modern understanding of epilepsy [12,13]. Knowledge of epilepsy increased in the 19th century, focusing on classification, etiology, pathophysiology and topographic localization. This was followed by rapid development in medical knowledge in the 20th century [14–17].

The aim of this documentation is to provide a brief, yet concise overview of the most important milestones in the history of epilepsy. In comparison to the many books written on this topic, this document references a significant number of Ancient texts from before the Common Era. This text provides the reader with a unique opportunity to appreciate the evolution of the idea of epilepsy: from a divine phenomenon to a more concise scientific explanation.

2. Before the common era

The first description of epilepsy can be found in Sumerian documents from the region of Mesopotamia (~2500 B.C.) [2]. The original text (written in the Akkadic language) describes the condition of *anta'subbu* (English: the hand of sin), which affects unclean and infectious-looking people. These patients were described as “unconscious with neck turned, arms/legs tense, eyes open and froth around the mouth”. It was believed that this person had broken social/religious rules and, as a sinner, was being punished by the goddess of the moon. At the time, known remedies included: exorcism, sacrificial offerings, atonements and religious rituals under the instruction of priests [18]. It was not until 1790 B.C. that the symptoms of epilepsy were meticulously described in *The Code of Hammurabi*. This was a set of laws written on a piece of stone 2.5 meters high and commissioned by the Babylonian King to regulate the social welfare of the epileptic. The law stated that if a slave were purchased, that slave can be returned within one month if he/she fell ill with *bennu* (English: falling sickness) [1].

Medical texts from ancient Egypt, dating back to the 18th Dynasty (~1700 B.C.), were the first to presumably describe focal seizures [3,8]. The original papyrus (as described by the Egyptologist Edwin Smith) referred to a condition called *nesejet*, which describes five patients suffering from involuntary convulsions of the body [18]. The earliest classification of seizures can be found in *Sakikku* (English: All Diseases), one of the oldest Babylonian medical texts (~1050 B.C.). It was writ-

ten on a stone tablet and refers to epilepsy as *miqtu* and *anta'subba* (similar to the name used by the Akkadians nearly 1500 years prior) [19]. The translated Babylonian text described nearly all types of epilepsy, such as: febrile seizures, petit and grand mal seizures, focal seizures, simple and complex partial seizures, pediatric seizures and status epilepticus [1,20].

A medical text from Ancient China (~600 B.C.) entitled *Zhu Bing Yuan Hou* differentiates between five categories of seizures. One category was called *Dian and Xian*, which was characterized by post-ictal memory loss [6]. A similar concept called *Caraca Samhitā Sutra* was described by the Indian medical author *Atreya* (~600 B.C.). He described a post-ictal paroxysmal loss of consciousness, which he thought was caused by cerebral dysfunction (and not by the Gods). Another Indian text *Ayurveda*, mentions four different types of epilepsy, which were accompanied by *Abasmara* (loss of previously acquired skills) [21].

The word *epilepsy* (Greek: επιληψία) undoubtedly has its roots in Ancient Greece (600–200 B.C.). It may be derived from the Ancient Greek verbs *επιλαμβάνειν* (English: in crisis), *επιτίθεμαι* (English: to attack), *αρπάζω* (English: to seize) and *έπιασε* (English: to grip) [22]. In Greek Mythology, epilepsy was a mystical phenomenon called a *miasma*. It was seen as a punishment by the Gods, was considered contagious and cured by the sacrificial death of the affected person [11]. It was not until the time of *Hippocrates* (460–390 B.C.), though, that the conception of epilepsy shifted from mystical to scientific.

The *Hippocratic Corpus*, within its 60 chapters, contains an essay entitled *On the Sacred Disease* [9–11]. This was the first scientific paper written that directly used the term *epilepsy* and very accurately described epileptic seizures. The goal of this script was to inform people about the disease, explain its natural origin, release fears, and recommend treatment. In his cardinal work, *Hippocrates* contrasted the natural opinion that epilepsy was a disease of the Gods, with an objective description: (1) the disease is not divine, (2) it is not a sacred disease, (3) it has the same origin as other illnesses, (4) it begins during embryogenesis and is caused by many factors such as temperature, fear, crying and heat stroke, and (5) prognosis is worse in children than in adults. He even went as far as to propose a neurosurgical procedure as treatment, referring that craniotomy should be performed at the opposite side of the brain as the seizures in order to spare patients from the *phlegma* that was causing the disease [23,24].

Aristotle (384–322 B.C.) was another Greek philosopher who wrote on epilepsy. In his treatise *On Sleep and Walking*, he described “sleep-related epilepsy”: he thought that food was able to produce *vapor* and that this would move through blood vessels and reach the brain during sleep [25]. The theory of *vapor* was later

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