

Rabies

A possible explanation for the vampire legend

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Article abstract—In the 18th century, belief in vampires—allegedly dead persons who left their graves and killed people and animals—raised great concern in the Balkans and an extensive debate in Europe. This historic phenomenon still awaits a comprehensive explanation. This article proposes that rabies may have played a key role in the development of the vampire legend, given the coincident time of the phenomena and the striking similarities between them.

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Nowadays, vampires are generally regarded as fictional characters. However, almost three centuries ago, when the concept and word “vampire” were created,¹ they were seen as a real threat by many people. “Vampires were the sole matter of conversation between 1730 and 1735,” as Voltaire stated.² The current study was done to evaluate a previous hypothesis³ proposing the existence of some link between rabies and the vampire legend.

Vampires. In 1693, a gazette revealed the existence of strange cadavers that were full of liquid blood, allegedly taken by the Devil from people and animals.⁴ Subsequently, the belief that those corpses left their graves spread through the Balkan region.

The inhabitants of the village saw a ghost which appeared to some people in the form of a dog, to others in the shape of a gaunt and hideous man, and who was seen not only by one individual but by many, and who caused persons the greatest alarm and torment by assaulting them fiercely, by seizing their throats so that they were almost suffocated. The ghost even attacked animals, and cows were found half dead just as if they had been severely beaten.⁵

The most famous story of vampires occurred in the Serbian village of Medvedja, in the winter of 1731–1732.⁶ The death of some peasants was attributed to a vampire who allegedly had also killed other people and animals. Eventually, 17 cadavers with “all the signs of vampirism” were uncovered and pierced with stakes, decapitated, and cremated. The repeated violations of graves provoked the intervention of the Austrian authorities, and the echo of these events generated one of the most extraordinary debates of the Enlightenment.^{6–8} In 1746, the French abbot Augustin Calmet summarized the situation⁹:

In this century, since around sixty years ago, a new scene is offered to our eyes. People who have been dead for several years, or at least for several months, have been seen to return, to talk, to walk, to infest the villages, to maltreat people and animals, to suck

the blood of their close ones, making them become ill and eventually die. Antiquity has certainly not seen or known anything of the like.

Rousseau also wrote on the subject:

If there is in the world a well documented story it is that of vampires. Nothing is lacking: oral trials, certificates of outstanding people, of surgeons, of priests, of magistrates. After that, who would believe in vampires?¹⁰

The protagonist of the legend attained such popularity as to earn a portrayal by Goya.¹ During the second half of the 18th century, vampires progressively vanished from the Balkans, but they later reappeared in the works of many European and American writers.¹ Dracula, a literary character created in 1897, has become the paradigm of vampires after being depicted in many films. The name and some other attributes of Dracula were taken from those of a 15th century Walachian ruler who had no connection to the vampire legend.

More on vampires. The anthropologic data collected by folklorists from people who believed in vampires, together with the historic reports, permit a fairly good reconstruction of the legend. Dogs and wolves were the animals most related to vampires, and were also reported as being their worst enemies.^{11,12} A vampire could allegedly turn into a dog and kill all the dogs of its village.¹³ Apart from having a human figure, these creatures could appear in the shape of a wolf, dog, or cat, or be invisible.^{12–14} Vampires were usually male,^{13,14} and used to be poor people from rural areas.^{5,15} The vampires' activity was mainly nocturnal,^{8,12–14} but could be diurnal.^{5,9,14} Vampires were thought to suck blood and attack people, dogs, cattle, and other tame animals.^{5,8,11,12,16,17} Vampires were thought to leave their graves to have sexual intercourse.¹⁷ A person could become a vampire by being attacked by a vampire,^{6,8} eating the flesh of animals killed by vampires,¹⁷ having been a great lover,^{15,16} or having died of plague, rabies, or other epi-

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demetic diseases.⁹ A cadaver could turn into a vampire if it saw itself in a mirror, or if a dog, cat, or bat walked over it before burial.^{12,14,16} Protective measures used against vampires included rubbing garlic or burning resin,¹⁶ burying suspicious cadavers in islands or lakes, or pouring water around their coffins.¹³ The vampires' victims were said to experience suffocation before death.⁸ The vampires' life was supposed to last for 40 days.¹⁴ Signs that made a cadaver suspicious included good external appearance,^{6,8} a swollen body full of liquid blood that flowed out of the mouth,^{4,6} prominent genitalia,¹⁸ and the emission of a cry when a stake was driven into it.^{6,7}

Medical approach to vampires. Many features attributed to vampires have also been described in disorders of the limbic system. This "brutish part" of the brain plays a central role in the regulation of emotion and behavior.¹⁹ In patients with diseases such as rabies or epilepsy, a clear link has been found between aggressiveness and the dysfunction of some limbic system regions, i.e., the hypothalamus, the amygdaloid complex, or the hippocampus.¹⁹ Likewise, a relation has been shown in humans between altered sexual behavior and some limbic system structures, such as the septal area.²⁰ Nocturnal activity may be present in patients with insomnia or disruption of the sleep-wake cycle; both have been reported in disorders of the anterior hypothalamus.²¹

The involvement of people and animals in vampirism could be evocative of a zoonosis, i.e., a disease transmitted from vertebrates to humans.²² The fact that the vampire bite transformed its victim into a vampire¹⁸ would evoke a zoonosis transmitted through a bite. Among the few zoonoses of such type,²² only rabies resembles vampirism in its fatal prognosis and in the implicated animals.

Certain modificatory factors of the usual postmortem evolution²³ could explain the preservation of the vampires' cadavers. Their retarded decay could be the result of coldness. Their good appearance would also suggest the presence of saponification. This process, characteristic of burials in humid places, transforms the subcutaneous tissues into a wax-like substance, and permits the identification of cadavers years after burial. Such phenomena could have taken place in Medvedja; it is near the Morava river and covered by snow several months every year. Blood can be fluid postmortem after different types of death, but it appears to remain liquid longer after sudden deaths due to asphyxia, shock, or collapse.²³ The swelling and foul odor of the vampires' cadavers^{4,9} suggest that they were in the second stage of decomposition, when dissolution of internal tissues with formation of gases occur. This produces a distention of the body, genitalia, neck, and face, with protrusion of the tongue and appearance of a bloodstained froth at the mouth.²³ Therefore, some features described in vampires could be explainable by natural processes; others bring to mind a fatal zoonosis with a tendency to involve the limbic system, as is the case with rabies.

Similarities between vampirism and rabies.

The rabies virus is normally introduced into the body through a bite and, after a silent interval, reaches the CNS by following the peripheral nerves.²⁴ In humans, this incubation period can last from less than 10 days to several years (usually between 2 weeks and 2 months).²⁴ Subsequently, nonspecific prodromal symptoms, such as loss of appetite, fever, anxiety, disturbed sleep, and fatigue, are present for several days.^{24,25} Pain and abnormal sensation in the bite wound are characteristic symptoms that can appear even when the wound is healed.²⁴ Eventually, the overt manifestations of the disease become evident.²⁴⁻²⁷ In fewer than 20% of patients, symptoms take the form of a flaccid and progressive paralysis (paralytic rabies). Humans usually develop a form of encephalitis known as furious rabies due to the predilection of the virus for the limbic system. The untreated patient with furious rabies frequently manifests a wandering tendency, restlessness, signs of autonomic dysfunction, hypersensitivity to stimuli, a feeling of terror, persistent insomnia, and an increasing agitation. In a few days, the most characteristic features of rabies, hydrophobia and muscular spasms, usually become apparent. Finally, paralytic symptoms and coma may appear before death.

In certain cases, rabies appears similar to vampirism. The characteristic spasms regularly involve the facial, laryngeal, and pharyngeal muscles, and may cause emission of hoarse sounds and an appearance with "the teeth clinched and the lips retracted as those of an animal."²⁶ Meanwhile, "the saliva cannot be swallowed, so frothing at the mouth and vomiting of bloody fluid occurs."²⁷ The spasms are generally triggered by some stimuli, such as air draughts (aerophobia), water (hydrophobia), light (photophobia), noises, odor, a minimal excitement, or the sight of mirrors.^{24,25,27} A man was not considered rabid if he was able to stand the sight of his own image in a mirror. Intermittent furious accesses may be impressive in some instances. "The rabid patient rushes at those who approach him, biting and tearing them as if he was a wild beast."²⁸ During these episodes, the patient's appearance is frightening, and has been compared to that of a furious wolf.²⁶ Nowadays, this dramatic picture is seen rarely, partly due to early medical intervention and partly because the aggressiveness caused by rabies is inversely related to the cultural level of the sufferer.^{25,26} During quiet intervals, the patient "lies in bed mentally alert but terrified, with bloody saliva drooling from the mouth."²⁷ Nightmares, illusions, and hallucinations may be present at this stage.^{25,26} Difficulty in breathing and a sensation of tightness in the throat are also frequent symptoms.^{25,26} Hypersexuality may be a striking manifestation of furious rabies. Some men can stay "several days with permanent penile erection and even with ejaculations associated with voluptuous sensations."²⁵ The literature reports cases of rabid patients who practiced intercourse up to 30 times in a day,²⁵ or who made violent rape attempts.^{24,26}

Vampirism and rabies share many zoonotic features, for instance, in the animals involved in both conditions. Dogs have been the most frequent transmitters of rabies to man. However, the stories of rabid wolves biting scores of people in a single day made them the most feared animals in Europe some centuries ago.²⁹ Vampire bats in America and nonhematophagous bats in America and in Europe have also transmitted rabies to humans.^{27,30} The puzzling metamorphosis of vampires from human to animal shape might have some form of explanation. Rabies is considered an isosymptomatic zoonosis because it can produce a similar furious picture in humans and in animals such as dogs, wolves, cats, and bats. Consequently, it would be imaginable that men and beasts with identical ferocious and bizarre behavior might have been seen, by a primitive witness, as similar malign beings. Farm animals were said to be frequent victims of vampires but they were usually not regarded as vampires. Likewise, farm animals usually contract paralytic rabies and become victims but not aggressive transmitters of the disease.

Rabies is usually communicated through a bite. However, humans have also acquired the infection through intact bucal or genital mucosae, or by inhalation of the virus in caves densely populated by bats.²⁴ Transmission of rabies from human to human has occasionally been reported, and attributed to sexual practices, bites, or nursing of patients.²⁴ Man has a tendency to bite, both in fighting and in sexual activities.³¹ The intensification of such tendency by rabies increases the risk of transmission, as the virus is in the saliva and other body secretions.²⁴ Consequently, prophylactic treatment is recommended for those in close contact with a person with rabies.³² Although difficult to imagine in countries with sophisticated medical care, in the past, interhuman transmission of rabies may have occurred, especially in remote regions.

Similar to the case in vampirism, rabies is seven times more frequent in males than in females, both in humans and in animals,²⁴ and prevails in rural areas.²⁸ In addition, a major epidemic of rabies in dogs, wolves, and other wild animals was recorded in Hungary around 1721–1728.²⁹

Patients with rabies usually live less than 2 weeks and die by asphyxia or cardiorespiratory arrest.^{24,25} These types of death would account for some post-mortem features documented in rabies, such as persistence of liquid blood, turgescence of the genitalia, and emission of sperm.^{25,28} People with this disease, however, sometimes faced a more dramatic end: "The fear of rabies was such that often persons even suspected of hydrophobia were killed like wild animals . . . (by being) shot, poisoned, strangled or suffocated."³³ The social alarm prompted by rabies moved some medical academies, religious institutions, and kings to propose remedies.²⁹ Rabies inspired the work of many writers,¹ and possibly gave rise to some classic Greek myths.²⁹ Furthermore, a connection between rabies and the development of the werewolf legend could be hypothesized.¹

Theories about the vampire legend. In the 18th century, some enlightened thinkers attributed the vampire legend to ignorance and superstition.^{2,7,9,10} In modern times, other interpretations have been made. Some psychoanalysts, following their particular approaches, have concluded that vampires represented different symbolisms.^{34,35} In 1985, Dolphin suggested that porphyria might have been the basis for the vampire legend³⁶; his unpublished theory has been criticized elsewhere.³⁷ Kayton supported a connection with schizophrenia, arguing that "many behaviors and inner experiences of schizophrenics are similar to aspects of the vampire legend."³⁸ Barber¹⁸ attributed the belief to the fact that laymen are prone to misinterpret the observations made on cadavers. Thus, the idea that vampires sucked blood would be based on the presence of liquid blood inside bloated corpses and at the corners of corpses' mouths. Barber hypothesized that dead bodies might have been disinterred by dogs, wolves, or spontaneously due to superficial burials in times of epidemics. This would explain, in his view, both the idea that vampires left their graves and the implication of animals in the legend. Although the aforementioned theories may contain some reasonable points, they do not provide a comprehensive explanation for the legend.^{1,37} In recent years, some similarities between rabies and vampirism have been noted.^{3,39,40} This resemblance was advocated as early as 1733, when an anonymous physician argued that vampirism "is a contagious illness more or less of the same nature as that which comes from the bite of a rabid dog."⁷

Origin of the legend. According to Calmet's description,⁹ the vampire concept included two components, i.e., the dead body, which could be termed the "lying vampire"; and the allegedly reanimated body, which could be called the "wandering vampire."

Balkan villagers considered the lying vampire to be undead and harmful; the enlightened people of the time had a rational explanation for such atypical cadavers.^{7,9} Therefore, ignorance and the tendency to attribute obscure phenomena to metaphysical forces (i.e., animism) could have been responsible for the generation of the vampire legend. On the other hand, priests were involved in exhumation of cadavers, and the Greek Orthodox Church considered incorruptibility of a corpse as an evil sign.⁹ This supports some role of religion in the development of the legend.

Rabies may have had an important role in the generation of the legend. The wandering vampire was said to attack people and animals, sometimes invisibly and sometimes in human or animal shape. These wandering vampires might have been people or animals with unrecognized furious rabies. At that time and in some circumstances, the diagnosis of rabies could have been easily missed. This could be the case if the bite was old or due to an animal other than a dog, if the infection was acquired by inhalation or sexual contact, or if the patient developed a bizarre behavior. Certain symptoms of rabies, such

as aggressiveness and hypersexuality, may be overlooked as manifestations of disease. A recently published case is illustrative:

An unknown, middle-aged man . . . was seen as a "wandering lunatic" on the road, wearing dirty clothes, talking in excess, dancing, singing and occasionally weeping. He made sexual advances and remarks to the ladies passing by. When he tried to assault a lady on the road, he was severely beaten up.⁴¹

In this instance, the unsuspected diagnosis of rabies was made after a postmortem study. Given the predominance of violent behavior among rabid patients with a low educational level, such "wandering lunatics" could be expected to have been more common at the beginning of the 18th century.

Balkan peasants believed that the lying and the wandering vampire were the same being. An explanation for this mystery could be that they had discovered some analogies between them. One may imagine how this could have happened, especially if rabid patients were taken for wandering vampires. A rabid patient, buried in a cold and humid place, would have had the capacity to develop, during his illness and after death, all the features attributed to a wandering and a lying vampire. If this occurred in a rural society, it could have caused a tremendous impact and an erroneous interpretation.

Much evidence supports that rabies could have played a key role in the generation of the vampire legend. This would be in accordance with the anthropologic theory that assumes that many popular legends have been prompted by facts.⁴² Under this approach, saying that the vampire is "mere fiction"³⁷ may be somewhat inappropriate. The past occurrence of epidemics of men and animals that bit others and transmitted the same disease to them can now be scientifically understood. It can also be accepted that those men showed hypersexuality, intolerance to mirrors and smelling substances, and liquid blood after death. Finally, it can be scientifically stated that this unique picture may be seen, even nowadays, in some unfortunate cases of furious rabies.

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