MEDICINE THEN AND NOW

Harriet Tubman's Hypersomnia: Insights from Historical and Medical Perspectives

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ABSTRACT

Harriet Tubman, a hero of the abolitionist movement and early civil rights advocate, suffered a head injury in childhood and subsequently developed sleep attacks associated with visions that were extensively documented in historical accounts. Her contemporaries perceived these visions together with unpredictable and unavoidable urges to sleep as manifestations of her deep faith, rather than as symptoms of an illness. While religious perspectives remain crucial to understanding Tubman's sleep-related experiences, some may consider them insufficient in view of modern medical advances. We propose the parallel explanation that her sleep attacks, usually attributed to temporal lobe epilepsy, actually represent a hypersomnia that is most consistent with the modern diagnosis of post-traumatic narcolepsy. Using historical analysis as well as current understandings of sleep medicine, we aim to shed light on this under-recognized aspect of Tubman's life. In addition, this case study allows us to review the potential long-term effects of severe traumatic brain injuries; consider a differential for excessive daytime sleepiness and hypnagogic hallucinations; and familiarize readers with the pathophysiology, diagnosis, and treatment of narcolepsy. Whether her symptoms are viewed through the lens of the past or measured against current biomedical standards, Tubman demonstrated an inspiring ability to persevere despite intrusive sleep episodes and to realize her dreams for the betterment of others.

KEY WORDS: Harriet Tubman; narcolepsy; hypersomnia; TBI

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INTRODUCTION

About 200 years ago, Harriet Tubman was born into slavery on a Maryland plantation. With resilience, persistence, and courage, she escaped and overcame tremendous adversity to liberate countless enslaved people via the Underground Railroad. Her legacy as a national hero has been further solidified by her service to the Union Army, as well as her leadership in the abolition and suffrage movements that reshaped the postbellum USA. Still, the extent of Tubman's resilience has not been fully recognized. In addition to the barriers she faced in slavery and in life as an African-American woman in the nineteenth century, historical accounts reveal that after a childhood head injury, she withstood frequent episodes of daytime sleepiness that interrupted her daily activities.[1–4] Here, we apply historical analysis, as well as current understandings of sleep medicine, to shed light on this under-recognized aspect of Tubman's experience (Fig. 1).

HEAD INJURY AND SUBSEQUENT SLEEP ATTACKS

At age 13, Tubman sustained a head injury when a plantation overseer struck her in the forehead with an iron weight[1]:

> *"The overseer caught up a two-pound weight from the counter and threw it at the fugitive, but it fell short and struck Harriet a stunning blow on the head."*[4] *Tubman later told Emma Telford that … the last thing she remembered was the overseer "raising up his arm to throw an iron weight at one of the slaves and that was the last I knew."*[3, 5] *She remembered vividly how the weight "broke my skull and cut a piece of that shawl clean off and drove it into my head. They carried me to the house all bleeding and fainting. I had no bed, no place to lie down on at all, and they lay me on the seat of the loom, and I stayed there all that day and next."*[3, 5]

Such brutality against enslaved people was commonplace and normalized among White communities; whereas countless acts of violence will remain forever unrecognized, Tubman's head injury is unique in that a description of the attack was recorded.[3] Tubman and those close to her described an acute loss of consciousness and anterograde amnesia, followed by headaches and subsequent sleep attacks, vivid dreams, and visions that lasted throughout her life.[1–4, 6]

The intense episodes of sleepiness that started after her injury occurred throughout the day, involved sudden lethargy and sleep even in the middle of working or talking, and resolved abruptly after napping for a few minutes. Tubman would then pick up where she left off in the conversation,

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[1] Excerpts in italicized text are from the Tubman biography by K.C. Larson, who compiled quotations from primary sources that we have independently reviewed and cited. Citations of italicized material reflect where the authors cross-checked the information in other sources.

Figure 1 Harriet Tubman, 1906. Collections of the Massachusetts Historical Society

though her lapses into sleep may have challenged her ability to engage socially and to stay alert during rescue missions.

According to primary accounts of those who knew her:

> *Tubman was often subject to unexpected episodes of "lethargy … coming upon her in the midst of conversation, or whatever she may be doing, and throwing her into a deep slumber, from which she will presently rouse herself, and go on with her conversation or work."*[3, 4] *… The Freedmen's Record reported in 1865 that the injury "still makes her very lethargic. She cannot remain quiet fifteen minutes without appearing to fall asleep. It is not a refreshing slumber; but a heavy, weary condition which exhausts her."*[3, 4, 7, 8]

> *Wilbur Siebert interviewed Harriet Tubman in the mid-1890s and noted with surprise that her injury "caused her at frequent intervals (say of half an hour or so) to lose consciousness for three or four minutes. She explained that her head would drop and she would become silent, but I was not to become alarmed; she would arouse and continue her talk without losing the thread of her conversation."*[3, 9]

> *… Lethargy often came upon her with no notice, and during her rescues she would occasionally drop off to sleep, jeopardizing the safety of her parties of runaways. But she never "lost a passenger," and her friends and family marveled at her ability to run the "gauntlet of the most difficult parts of the Southern country."*[3, 10]

HOW WERE TUBMAN'S SLEEP ATTACKS PERCEIVED IN HER TIME?

To the best of our knowledge, Tubman did not seek or receive medical assessment for these episodes of sleepiness during her life in slavery or as a free woman.[2] In the early 1800s, most modern medical diagnoses — including sleep disorders such as narcolepsy — had not yet been defined as clinical entities, although sparse case reports describing hypersomnias had been published as early as the 1600s.[11, 12] These early reports identified different patterns of what was considered "pathological sleep," some of which included periodic sleep episodes similar to those described in Tubman's accounts. Two of the earliest descriptions in Western medical literature of what might today be considered narcolepsy were written when Tubman was in her late fifties, and both made note of preceding head trauma. German physician Karl Friedrich Otto Westphal observed in 1877 how both his patient and his patient's mother experienced similar "sleep attacks," including that the mother's symptoms began after a falling brick struck her head; French physician Jean-Baptiste-Édouard Gélineau noted in 1880 that a log had fallen on his patient's head years before the onset of his "sleep attacks."[13] While neither physician was convinced of any role for head trauma in the development of narcolepsy, Gélineau theorized that sleep attacks may occur when strong emotions lead to oxygen deprivation in the brainstem.[13]

In the mid-nineteenth century, connections between head trauma (now referred to as "traumatic brain injury" or "TBI") and sleepiness were only first being recognized. We have identified only a handful of case reports from Tubman's time on the subject of post-TBI sleepiness, primarily from records of head injuries sustained during the US Civil War. These reports made brief mention of a "tendency to sleep" after the injury, suggesting that post-TBI hypersomnia was beginning to be recognized by physicians of the time.[14] However, the phenomenon was not yet incorporated into any formal diagnostic categorization.

Regardless of whether a medical explanation had been available in Tubman's time, some of her friends and biographers drew a connection between her head injury and the episodes of "lethargy." However, her sleep attacks were not necessarily viewed as symptoms of an illness. Accounts by Tubman's contemporaries suggest that her sleep attacks may have been

[2] During an interview in her later years, Tubman recounted that she pursued surgical treatment in Boston for debilitating headaches: the surgeon "sawed open my skull, and raised it up, and now it feels more comfortable."[6] Historians have postulated that the headaches were related to her childhood head injury, and that the surgery likely occurred in the late 1890s at Massachusetts General Hospital.[3] However, we and others have been unable to find any documentation of the clinical encounter. Notably, Tubman did not cite sleep attacks as part of her reason for seeking this treatment.

perceived, by some, as both a consequence of her head injury and a sign of her temperament:

> Here in her thirteenth year she is just recovering from the first terrible effects of an injury inflicted by her master, who in an ungovernable fit of rage threw a heavy weight at the unoffending child, breaking in her skull, and causing a pressure upon her brain, from which in her old age she is suffering still. This pressure it was which caused the fits of somnolency so frequently to come upon her, and which gave her the appearance of being stupid and half-witted in those early years.[6]

Importantly, any such perceptions of being "half-witted" due to her sleep attacks did not last. On the contrary, Tubman distinguished herself as an admirable leader, whose followers were particularly captivated by her profound spirituality.[1–3]

VIVID DREAMS AND VISIONS

Harriet Tubman was known by her contemporaries as a deeply spiritual individual.[1–3] On numerous occasions, she experienced spiritual visions, many of which occurred during sleep attacks such as those discussed above. Of note, although she grew up in a devout family during an intensely religious period in US history, her visions seemed to emerge only after the childhood head injury.[3, 6]

Friends and contemporary biographers described Tubman's dreams and visions:

> When these turns of somnolency come upon Harriet, she imagines that her "spirit" leaves her body, and visits other scenes and places, not only in this world, but in the world of spirits. And her ideas of these scenes show, to say the least of it, a vividness of imagination seldom equaled in the soarings of the most cultivated minds.[4]

> She loves to describe her visions, which are very real to her … Often these visions came to her in the midst of her work.[7]

> *"We'd been carting manure all day," Tubman once explained to an interviewer … "when suddenly I heard such music as filled all the air." Soon she began to experience a powerful religious vision, "which she described in language which sounded like the old prophets in its grand flow." Persistent shaking by her fellow slaves brought her back to reality, though she protested that she hadn't been asleep at all.*[3, 7]

HOW WERE TUBMAN'S VISIONS PERCEIVED IN HER TIME?

Tubman's visions associated with sleep attacks were likely viewed by friends and colleagues as part of a deep spirituality that was at the core of her identity. It is not surprising that her visions took on religious and spiritual themes, since these served as core frameworks for the outlooks of many enslaved and free people in the USA during this period. Religion — particularly evangelical Protestantism spurred by the Second Great Awakening — helped enslaved people cope with daily brutalities as well as a lack of control in everyday life.[3, 15–17] Many Black preachers' interpretations of the Bible differed in key ways from their White counterparts', in particular, by expressing the belief that God intended for enslaved people to be free.[3, 17] By rejecting White versions of Christianity, Black preachers and their congregants leveraged religion to resist oppression.[15, 16] Because they were concerned about the possibility of Black ministers conveying subversive messages, some enslavers either tried to deny enslaved people the practice of religion or else prevented them from choosing their own churches.[3] While religious practice was generally unimpeded in eastern Maryland where Tubman was enslaved — aligning with the White evangelical belief that enslaved people should be spiritually converted — it is thought that Tubman and her family attended the church services of their enslavers.[3, 15]

The religious sentiment of Tubman's time was deeply intertwined with understandings of visions and sleep attacks. Animated expressions of faith were prominent elements of life in mid-nineteenth-century America. In particular, religious ecstasy — including trances, shouting, and fainting — was a fixture of revival meetings among Black and White congregants alike.[16] Many considered experiences such as seeing visions and hearing voices as manifestations of the "acute fever" of religion; individuals who perceived these phenomena were often considered to be spiritual geniuses or "mystics."[18] Similar experiences of visions or voices were seen as pathological in certain medical contexts during this period; yet in religious contexts, they were seen as sources of spiritual authority and influence rather than signs of disease.[18]

Historical accounts connected Tubman's head injury with her sleep attacks and her visions. Although these reports do not provide clear answers as to how Tubman's sleep-related experiences were explained in her time, it is likely that — in the intense religious atmosphere of the day — her attacks of sleep often coinciding with spiritual visions were taken together as an expression, or evidence of, her profound faith.[3] In both Black and White Christian communities, sleep and dreaming were widely viewed as times of particular closeness with God, and many mystics reported experiencing their visions during sleep.[18, 19] Moreover, the temporal connections drawn between Tubman's head injury and the onset of her sleep-related visions suggest that her inspiring expressions of spirituality may have been seen, in part, as related to her childhood head injury. Importantly, any associations made between Tubman's head injury and the onset of her sleep attacks and visions did not seem to detract from their spiritual significance, nor did they lead to any known descriptions based on an "illness" framework during her lifetime.

TUBMAN'S HYPERSOMNIA FROM A MODERN MEDICAL PERSPECTIVE

While religious explanations remain crucial to understanding Tubman's sleep-related experiences, some may consider them insufficient in light of modern medical advances. By taking into account current understandings of neuroanatomy, TBI, and the pathophysiology of sleep disorders, we can consider parallel, possibly unifying explanations for her constellation of symptoms. Through a modern clinical lens, we argue that Tubman's sleep attacks and associated visions preceded by her childhood TBI may be best characterized as post-traumatic narcolepsy.

In modern medical terms, Tubman's persistent sleep attacks after a TBI represent a form of excessive daytime sleepiness (EDS). Descriptions of Tubman's sleepiness tend to focus on her sudden lapses into sleep, and alertness afterwards, although they do not suggest that she was particularly sleepy at other times. EDS and an increase in total sleep are reported in 14–57% of individuals with TBI.[20, 21] The duration of post-TBI sleep-wake disturbances is variable, but symptoms often persist for years.[22, 23]

EDS is also a core feature of narcolepsy.[24–26] On rare occasions, true narcolepsy with cataplexy — defined by transient episodes of emotion-triggered muscle weakness — can occur after TBI.[24–29] Descriptions of Tubman's sleep attacks do not mention a generalized loss of muscle tone, arguing against cataplexy. Nonetheless, the seemingly sudden, intrusive, and frequent nature of her sleep episodes is consistent with narcolepsy without cataplexy, which can also develop after TBI.[27, 28]

In addition to EDS, experiences of vivid imagery have been reported after TBI; these are often characterized as "hypnagogic hallucinations" when they occur at the onset of sleep.[20] Accounts of Tubman's visions indicate that some, if not most, were experienced during or around sleep episodes.

Hypnagogic hallucinations are another common symptom of narcolepsy.[24–26, 30, 31] Like sleep paralysis and cataplexy, these experiences may represent intrusions of REM sleep features into wakefulness.[24–26] In addition, patients with narcolepsy tend to rate their dreams as more vivid than healthy individuals', and they are more likely to confuse their dreams with wakefulness.[32] Furthermore, proprioceptive and visual experiences involving flight or out-of-body experiences, such as Tubman described, are especially common in narcolepsy.[33] Of note, patients with narcolepsy tend to score highly on measures of creative thinking, an attribute that Tubman exemplified through her own descriptions of her visions.[34] Perhaps some of the visions Tubman recalled after her TBI were hypnagogic hallucinations; however, as the number and quality of historical accounts are limited, it is impossible to definitively characterize her visions as such.

Considered together from a modern clinical perspective, Tubman's symptoms may be consistent with post-traumatic narcolepsy. Narcolepsy is uncommon among the many types of sleep disturbances that TBI can produce; however, this diagnosis is certainly plausible given that after her TBI, Tubman developed EDS with imperative episodes of sleep, as well as vivid and life-like dreams at the onset of sleep similar to modern descriptions of hypnagogic hallucinations. Ultimately, the historical accounts of Tubman's symptoms are not specific enough to be definitively classified according to today's nosology. Furthermore, a modern diagnosis of narcolepsy requires confirmation of clinical symptoms in addition to sleep studies, including polysomnography and a multiple sleep latency test, and sometimes measurement of cerebrospinal fluid (CSF) orexin levels. Without more detailed clinical descriptions and modern diagnostic tests, we will never have a definitive medical explanation for Tubman's hypersomnia; nonetheless, using the framework of current understandings in sleep medicine, her intrusive daytime sleep attacks associated with prominent visions — which began after a TBI — are most consistent with post-traumatic narcolepsy.

Sleep medicine and our understanding of sleep disorders' biological underpinnings have made great advancements in the last century. Today we know that classic narcolepsy (narcolepsy with cataplexy) is caused by a severe and selective loss of the hypothalamic neurons producing the orexin neuropeptides, probably due to an autoimmune process, and narcolepsy without cataplexy could be due to a partial loss of these neurons.[24–26, 35] Severe TBI has also been associated with an acute, partial loss of the orexin-producing neurons and reductions in CSF orexin levels.[20, 27, 29] Beyond this direct injury, TBI might breach the blood-brain barrier, triggering an autoimmune attack on the orexin-producing neurons in genetically susceptible individuals who carry HLA-DQB1*06:02.[24–26, 35] Further investigations are needed to better understand why some people develop narcolepsy after TBI, and to establish preventive measures for those at greatest risk.

Several effective treatments are currently available for patients with narcolepsy. Therapeutic options were much more limited during Tubman's time, before any clear classification yet existed to define or understand her symptoms from a biomedical perspective.[13, 36] Early reports described several attempted treatments for hypersomnias, including caffeine, bromides, amyl nitrate, and other chemicals administered to stimulate the nervous system or increase brainstem perfusion; however, none proved consistently effective.[11, 13] More promising treatments for narcolepsy, including ephedrine and amphetamines, would not be introduced until the 1930s.[11, 36] Standard of care today combines non-pharmacological approaches (e.g., napping, sleep hygiene, psychotherapy) with wake-promoting medications (e.g., modafinil, methylphenidate, amphetamines) or oxybates, depending on the degree of symptom severity.[35]

Ultimately, while the historical and modern medical perspectives presented here may seem disparate, we believe that they complement each other to yield a more complete understanding of Tubman's sleep-related experiences. Even if some of her visions began with or involved hypnagogic hallucinations, such a possible explanation should not detract from or minimize their spiritual significance to Tubman, their role in inspiring her followers, or their part in guiding the heroic work she performed throughout her life. We do not wish to suggest that her visions were merely manifestations of a disease process; rather, we propose that Tubman's TBI, if implicated in the development of her sleep-related symptoms and visions within a narcolepsy framework, could have led to neurobiological changes that were conducive to the unique experiences of her visions. With these visions reflecting the intense religiosity of her time and upbringing, we suggest the possibility that Tubman's faith and religious environment were intertwined with neurologic sequelae of her head injury, together leading to the immersive and deeply spiritual experiences which were seen as unique and inspiring by her contemporaries.[3] Indeed, her profound faith and her natural ability to lead earned her the nickname "Moses."[1–3]

LIMITATIONS AND ALTERNATIVE EXPLANATIONS

It is important to acknowledge the limitations of this modern medical assessment, as well as alternative possible diagnoses. First, the primary accounts describing Tubman's symptoms are limited in scope and lack sufficient detail to definitively support the presence of classic narcolepsy features such as sleep paralysis or cataplexy. Second, many of these accounts were written by Tubman's personal friends and historians; devoted to promoting her legacy, they may have omitted illness-based interpretations of her sleep attacks and visions to protect her reputation. Alternatively, such interpretations could have been inaccessible given limitations in medical knowledge and its public availability. Third, while her sleepiness seems to have arisen soon after her TBI, it may have developed independently from her TBI, as narcolepsy typically begins in adolescence.[24–26]

Furthermore, Tubman's symptoms might be explained, at least in part, by other modern diagnoses including temporal lobe epilepsy (TLE), post-traumatic stress disorder (PTSD), or direct injury to wake-promoting brain regions. Although Tubman's symptoms have not previously undergone rigorous evaluation through a modern medical lens, they have generally been attributed to TLE.[3, 37–39] Patients with TLE may experience symptoms similar to Tubman's, including sudden alterations in consciousness as well as auditory and visual hallucinations; in addition, TLE can also be caused by TBI.[40] However, in Tubman's case, TLE seems unlikely given her ability to be roused and the lack of historical accounts consistent with the auras, automatisms, or postictal confusion that are characteristic of TLE.[40] Although Tubman's sleep attacks could be interpreted as dissociative episodes, PTSD is also unlikely to explain her sleep-related constellation of symptoms, as there is no evidence these occurred in response to specific stressors or were related to specific traumatic experiences. Moreover, there is no evidence that Tubman was affected by marked hyperarousal or hyperreactivity, one of the core diagnostic criteria for PTSD.[41] Finally, while isolated sleep disturbances are common after TBI — possibly resulting from damage to wake-promoting neural systems — these would not typically be characterized by both hypnagogic hallucinations and sleep attacks.[22]

We must also recognize the limitations and implications of retrospective diagnosis as a methodology. This practice is rightly controversial among historians: why should we attempt to diagnose an illness in a patient whom we have never met, interviewed, or examined? From a historical perspective, our approach is inherently constructivist and probabilistic — as is the practice of diagnosis in a typical patient-physician relationship. Both processes involve generating and adjusting hypotheses based on the availability of new evidence and scientific discoveries; with continued advancement, disease classifications will change, and so will diagnoses. In clinical spaces, these iterations represent progress toward an improved understanding of the patient's illness, with the aim of identifying better treatments. In historical spaces, several useful outcomes of retrospective diagnosis have previously been delineated; these include improved understandings of a disease's influence on a historical figure's actions, as well as the experiences of people in a historical time living with the disease.[42]

IMPLICATIONS OF HISTORICAL AND MODERN MEDICAL ANALYSIS

While we cannot make a definitive diagnosis, we can leverage our advancing medical knowledge to re-evaluate Tubman's experience and thereby shed light on an under-recognized aspect of her fight for freedom. Viewing Tubman's life through a lens of disability may be consequential for the way we remember her;[43] rather than aiming to pathologize her experience — which is a common pitfall of retrospective diagnosis — we present our modern clinical perspective in parallel with historical ones to illustrate the range of ways that Tubman's sleep episodes may be understood depending on the cultural context and state of medical knowledge. Biomedical science is one valuable way to understand this aspect of her experience; when considered together with historical and religious perspectives, we believe that progress can be made toward a more complete understanding. By combining these viewpoints, it becomes clear that any neurologic process underlying Tubman's sleep attacks represented a source of strength and inspiration, rather than simply an illness to be treated.

Tubman's achievements continue to serve as inspiration for countless people fighting for freedom around the world. We hope that, by highlighting her experience of sleep attacks, individuals currently living with narcolepsy and other hypersomnias can draw further encouragement by recognizing all she accomplished in spite of them. We also hope that these novel perspectives may stimulate further scholarship on such poorly characterized topics as the lifelong sleep-related sequelae of TBI, the biology of post-traumatic narcolepsy, historical perceptions of hypersomnias across cultures, and the history of post-traumatic sleepiness.

CONCLUSION

Harriet Tubman suffered a head injury in childhood and subsequently developed a chronic sleep disturbance which may have been consistent with the modern-day diagnosis of narcolepsy. While such symptoms can be debilitating, Tubman was exceptional in overcoming frequent intrusive sleep attacks as well as significant trauma to lead the liberation of countless enslaved people, eventually becoming a celebrated early civil rights activist. Tubman's faith was at the heart of her fight for freedom, as well as the countless ways in which she inspired her contemporaries. Whether her symptoms are viewed through the lens of the past or measured against current biomedical standards, Tubman demonstrated a great ability to persevere despite hypersomnia and to realize her dreams for the betterment of others.

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