

Psychogenic Amnesia

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Psychogenic amnesia, also known as functional amnesia or dissociative amnesia, is a memory disorder characterized by extreme memory loss that is caused by extensive psychological stress and that cannot be attributed to a known neurobiological cause. Psychogenic amnesia is defined by (a) the presence of retrograde amnesia (the inability to retrieve stored memories leading up to the onset of amnesia), and (b) an absence of anterograde amnesia (the inability to form new long term memories). Dissociative amnesia is due to psychological rather than physiological causes and can sometimes be helped by therapy.

There are two types of psychogenic amnesia, global and situation-specific. Global amnesia, also known as fugue state, refers to a sudden loss of personal identity that lasts a few hours to days, and is typically preceded by severe stress and/or depressed mood. Fugue state is very rare, and usually resolves over time, often helped by therapy. In most cases, patients lose their autobiographical memory and personal identity even though they are able to learn new information and perform everyday functions normally. Other times, there may be a loss of basic semantic knowledge and procedural skills such as reading and writing. Situation-specific amnesia occurs as a result of a severely stressful event, as in post-traumatic stress disorder, child sex abuse, military combat or witnessing a family member's murder or suicide, and is somewhat common in cases of severe and/or repeated trauma.

Memory and the brain

Overview

There are three types of memory - sensory, short-term, and long-term memory. Sensory memory lasts up to hundreds of milliseconds; short-term memory lasts from seconds to minutes; while anything else longer than short-term memory is considered to be a long-term memory.

Information obtained from the peripheral nervous system (PNS) is processed in four stages - encoding, consolidating, storage, and retrieval. During encoding, the limbic system is responsible for "bottlenecking" or filtering information obtained from the PNS. According to the type of information being processed in a given instance, the duration of consolidating stage varies drastically. The majority of consolidated information gets stored in the cerebral cortical networks where the limbic system record episodic-autobiographical events. These stored episodic and semantic memories can be obtained by triggering the uncinate fascicle that interconnects the regions of the temporofrontal junction area.

Emotion seems to play an important role in memory processing in structures like the cingulated gyrus, the septal nuclei, and the amygdala that is primarily involved in emotional memories. Functional imaging of normal patients reveal that right-hemispheric amygdala and ventral prefrontal regions are activated when they were retrieving autobiographical information and events.

Additionally, the hippocampal region is known to be linked to recognizing faces.

Researchers have found that emotional memories can be suppressed in non-mentally ill individuals via the prefrontal cortex in two stages - an initial suppression of the sensory aspects of the memory, followed by a suppression of the emotional aspect. It has also been proposed that glucocorticoids can impair memory retrieval; rats and human males have been shown to be affected by this mechanism.

Traumas can interfere with several memory functions. Dr. Bessel van der Kolk divided these functional disturbances into four sets: traumatic amnesia, global memory impairment, dissociative processes and traumatic memories' sensorimotor organization. Traumatic amnesia involves the loss of remembering traumatic experiences. The younger the subject and the longer the traumatic event is, the greater the chance of significant amnesia. Global memory impairment makes it difficult for these subjects to construct an accurate account of their present and past history. Dissociation refers to memories being stored as fragments and not as unitary wholes. Not being able to integrate traumatic memories seems to be the main element which leads to PTSD. In the sensorimotor organization of traumatic memories, sensations are fragmented into different sensory components.

Comparison with organic causes

Clinically, psychogenic amnesia is characterized by the loss of the ability to retrieve stored memory without any apparent neurological damage; while organic amnesia is characterized by damages to the medial or anterior temporal and/or prefrontal regions caused by stroke, traumatic brain injury, ischemia, and encephalitis. Some characteristics that define organic amnesia is the maintenance of personal identity, basic semantic knowledge and procedural skills as well as neuroradiological images showing cerebral damage to the cortical and/or subcortical areas known to be associated with long-term memory while some characteristics that define psychogenic amnesia is the loss of personal identity, semantic knowledge, and procedural abilities at least in the early phase of amnesia as well as damage directly affecting cerebral areas critical for memory functioning that cannot be detected in clinical history or neuroradiological exams.

Imaging

Psychogenic amnesia is defined by the lack of structural damage to the brain, but upon functional imaging, an abnormal brain activity can be seen. Tests using functional magnetic resonance imaging suggest that patients with psychogenic amnesia are unable to retrieve emotional memories normally during the amnesic period, suggesting that changes in the limbic functions are related to the symptoms of psychogenic amnesia. By performing a positron emission tomography activation study on psychogenic amnesic patients with face recognition, it was found that activation

of the right anterior medial temporal region including the amygdala was increased in the patient whereas bilateral hippocampal regions increased only in the control subjects, demonstrating again that limbic and limbic-cortical functions are related to the symptoms of psychogenic amnesia.

Risk factors

Patients exposed to physically or emotionally traumatic events are at a higher risk for developing psychogenic amnesia because they seem to have damaged the neurons in the brain. Examples of individuals at greater risk of psychogenic amnesia due to traumatic events include soldiers who have experienced combat, individuals sexually and physically abused during childhood and individuals who have experienced domestic violence, natural disasters, or terrorist acts; essentially any sufficiently severe psychological stress, internal conflict, or intolerable life situation. Child abuse, especially chronic child abuse starting at an early age has been related to the development of high levels of dissociative symptoms, including amnesia for abuse memories. The study strongly suggested that "independent corroboration of recovered memories of abuse is often present" and that the recovery of the abuse memories generally is not associated with psychotherapy.

Prevalence

Elliott's study of a randomized nationwide sample (n=505) found that situation-specific psychogenic amnesia was somewhat common in the general population. 72% of subjects reported a profoundly distressing emotional trauma; 32% of these reported amnesia about part or all of the trauma, followed by "delayed recall" of the event. Traumatic events most commonly associated with psychogenic amnesia were witnessing a suicide or murder, and being sexually abused. Elliott also found that psychogenic amnesia was most strongly associated with severe and/or repeated traumas, and with traumas during childhood. When encountering stimuli similar to the trauma(s), subjects often reported many episodes of dissociation prior to the delayed recall. The most common "trigger" for recalling the traumatic event was a media event (e.g., while watching television or a movie), the least common trigger was psychotherapy or counseling.

Several studies have found that situation-specific psychogenic amnesia is common in verified victims of severe child abuse:

In a 1994 study, Williams found that amongst women with confirmed histories of childhood sexual abuse, about one third of subjects did not recall the abuse during interviews as adults; because these same women were usually willing to discuss other potentially embarrassing or shameful incidents (e.g, abortions, prostitution, sexual assaults as adults) Williams concluded the women had genuinely lost access to the traumatic memories. In a follow-up study published the next year, Williams found that in women (n=129)with documented histories of childhood sexual abuse, 16% reported a period when they were unable to recall all or part of the abuse.

Widom and Morris found that in adults (n=450) with confirmed childhood histories of severe neglect and abuse (physical and/or sexual), 59.3% reported periods of partial or complete amnesia for the maltreatment. Amnesia for abuse was most associated with cases of multiple perpetrators and fears of death if the abuse was disclosed.

Dahlenberg studied 17 women who recovered memories of childhood sexual abuse while in therapy; six independent evaluators determined that all 17 women adequately corroborated the memories.

Theoretical explanations

Psychogenic amnesia is far from being completely understood and while several explanations have been proposed, none of them have been verified as the mechanism that fits all types of psychogenic amnesia. Different theories include:

Freudian psychology states that psychogenic amnesia is an act of self-preservation, an alternative to suicide.

Cognitive point-of-view states that this disorder utilizes the body's personal semantic belief system to repress unwanted memories from entering the consciousness by altering neuropeptides and neurotransmitters released during stressful events, affecting the formation and recall of memory.

"Betrayal trauma theory suggests that psychogenic amnesia is an adaptive response to childhood abuse. When a parent or other powerful figure violates a fundamental ethic of human relationships, victims may need to remain unaware of the trauma not to reduce suffering but rather to promote survival. Amnesia enables the child to maintain an attachment with a figure vital to survival, development, and thriving. Analysis of evolutionary pressures, mental modules, social cognitions, and developmental needs suggests that the degree to which the most fundamental human ethics are violated can influence the nature, form, and processes of trauma and responses to trauma."

Normal autobiographical memory processing is blocked by imbalance or altered release of stress hormones such as glucocorticoids and mineralocorticoids in the brain. The regions of expanded limbic system in the right hemisphere are more vulnerable to stress and trauma, affecting the body's opioids, hormones, and neurotransmitters such as norepinephrine, serotonin, and neuropeptide Y. Increased levels of glucocorticoid and mineralocorticoid receptor density may affect the anterior temporal, orbitofrontal cortex, hippocampal, and amygdalar regions. These morphological changes may be caused by loss of regulation of gene expressions in those receptors along with inhibition of neurotrophic factors during chronic stress conditions.

Stress may directly affect the medial temporal/diencephalic system, inhibiting the retrieval of autobiographical memories and producing a loss of personal identity. Negative feedback produced by this system may dampen the patient's emotions, giving a perplexed or 'flat' appearance.

Treatments

Currently, various treatments are available for patients with psychogenic amnesia although no well-controlled studies on the effectiveness of different treatments exist.

Psychoanalysis - uses dream analysis, interpretation and other psychoanalytic methods to retrieve memories; may also involve placing patients in threatening situations where they are overwhelmed with intense emotion.

Medication and relaxation techniques - in conjunction with benzodiazepines and other hypnotic medications, the patient is urged to relax and attempt to recall memories. With the help of psychotherapy and learning their autobiographies from family members, most patients recover their memories completely.

It has been proposed that abreaction could be used in conjunction with midazolam to recover memories. This technique was used during the second World War but is currently much less popular. The technique is thought to work either through depressing the function of the cerebral cortex and therefore making the memory more tolerable when expressed, or through relieving the strength of an emotion attached to a memory which is so intense it suppresses memory function.

Some studies about psychogenic amnesia have concluded that psychotherapy is not connected to recovered memories of child sexual abuse. Data suggests that one's amnesic recovered memory is spontaneous, and that this is triggered by abuse-related stimuli.

In popular culture

Memory loss due to emotional upset or shock has been recognized since at least the first century: Pliny the Elder wrote, "Nothing whatever, in man, is of so frail a nature as the memory; for it is affected by disease, by injuries, and even by fright; being sometimes partially lost, and at other times entirely so."

Psychogenic amnesia is a common plot device in many films and books and other media. Examples include Shakespeare's King Lear who experienced amnesia and madness following a betrayal by his daughters; the title character Nina in Nicolas Dalayrac's opera of 1786 and the character of Jason Bourne as depicted in the Bourne film series; Jackie Chan in Who Am I?; the character Teri Bauer in 24; Goldie Hawn in Overboard; Leroy Jethro Gibbs in NCIS and the character Victoria Lord in One Life to Live.

Real life examples

A man later identified as Edward Lighthart woke up in Seattle's Discovery park, with supposed dissociative amnesia, on July 30, 2009, and briefly became a local mystery.

A man discovered unconscious on August 31, 2004, in Richmond Hill, Georgia who adopted the pseudonym Benjamin Kyle.