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REVIEW ARTICLE

The Science of Claustrophobia: from Origins to Enhanced Therapies

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ABSTRACT
A phobia is an anxiety condition characterized by a sense of dread that seriously impairs a person's capacity to go about their everyday lives. Claustrophobia is a specialized phobia that affects 15% to 37% of the global population. It is typified by an unreasonable fear of cramped or enclosed areas. A wide range of stimuli, including packed elevators, airplanes, trains, tunnels, changing rooms, and hotel rooms with closed doors and sealed windows, can cause claustrophobia. Typically, it causes panic episodes and is categorized as an anxiety condition. One well-known example of claustrophobia on a worldwide level is the magnetic resonance imaging (MRI) scan. The decrease of MRI-related anxiety and claustrophobia will be impacted by this succinct literature on diagnostic and therapeutic techniques. Furthermore, a significant body of research has been conducted on the usefulness of interoceptive stimulation, in vivo testing, and cognitive-behavioral therapy (CBT) as psychotherapies for claustrophobia.
Keywords –Anxiety, Claustrophobia, Cognitive-behavioral therapy, Diagnosis, Psychotherapy

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INTRODUCTION

An extreme fear that severely hinders a person's ability to function in daily life is the hallmark of a phobia, an anxiety condition. Evading circumstances or entities that elicit fear exemplifies a form of life impairment.[1] The Statistical and Diagnostic Manual of Mental Diseases has many categories for disorders of anxiety. These encompass social anxiety condition and panic disorder, separation anxiety instability, some fears, and mutism that is selective. The specific phobia has various subcategories, including sorts of injuries include situational, natural, a living thing, environmental, and blood-injection injuries.[2] Certain phobias are intense concerns over certain situations, individuals, items, or actions. Phobias are linked to the avoidance of specific stimuli, including individuals, locations, or animals. Children often experience anxieties. The prevalence of certain phobias among children aged 7 to 11 is around 2.4% and 0.9%, respectively.[1]

CLAUSTROPHOBIA

The term "claustrophobia" refers to the dread of confined areas.[2] Engine rooms, cellars, caverns, elevators, MRI machines, transit trains, and congested areas are all examples of enclosed settings. People who suffer from specific anxieties often tend to avoid the exact object or event that evokes fear in them. In a phobic environment, the dread may manifest as a fear of physical symptoms, revulsion, or injury. Although this can be painful and distressing, the majority of patients are able to adjust simply staying away from tiny or contained environments. People who respond to a single Activator event may respond to all of them. Claustrophobia is also identified by the apprehension of being confined, such as reclining in a dental chair or standing in a long procession. Prospective hazards, rather than restricted spaces, are the source of anxiety for claustrophobics.[1] The majority of claustrophobic individuals report feeling subjectively imprisoned, which is also a means to understand claustrophobia. In addition to movement restrictions, the majority of enclosed spaces involve some degree of entrapment. In "containment

scenarios," both humans and animals may be susceptible; experimental neuroses may develop rapidly when an animal is placed in a restricted environment. Individuals who are claustrophobic are susceptible to suffocation dread. This aspect of the condition is perceived as a significant threat by individuals with claustrophobia, as it is exceedingly strong and anticipated. Many individuals with claustrophobic tendencies experience breathlessness and the dread of suffocation when in confined spaces. These symptoms are closely related. It is an anxiety illness called claustrophobia that impacts 15% to 37% of the global population. In Latin, the phrase "claustrum" means "confined in place," while the Greek word "phobic" means "fear". Claustrophobia is a state of anxiety created by a restriction on one's freedom of mobility. Claustrophobia is classified as two symptoms of situational anxiety disorder substantially linked components in the Diagnostic along with Statistical Manual regarding Mental Disorders. Both of the greatest fears linked to claustrophobia are suffocation and confinement. Nevertheless, claustrophobia impacts only about 3% of the global population. The number of individuals scheduled for magnetic resonance imaging may be affected by a range of 0.7% to 14.0%. Rather than being frightened of confined spaces in general, individuals with claustrophobia are apprehensive about the potential consequences found within them. Dungeons, tunnels, and Similar alternative environments which restricts either limit mobility are instances of restricted spaces.[3] Individuals that exhibit an anxiety response to any of the aforementioned Claustrophobia: A Problem with Potential Solutions It is highly probable that all 16 scenarios will demonstrate the same response under similar circumstances. Speculation has been prompted by the dread of small spaces that humans experience; claustrophobic sentiments have been associated with those expressed by animals whose escape is restricted to a small area. This is a logical justification for the fear of masses. A preventive apprehension is one perspective on claustrophobia. Claustrophobia may be inclined to overestimate their likelihood of experiencing claustrophobic symptoms due to the application of "rules-of-thumb." Claustrophobic individuals recall disagreeable circumstances more rapidly, as per the first law of availability. Secondly, individuals who experience claustrophobia are more likely to visualize themselves in environments that make them feel confined, as per the simulation rule. Representativeness is the concluding component. The detrimental effects of claustrophobia may be exaggerated by individuals who suffer from the condition in contrast to the relatively benign environments that statistics indicate. MRI (magnetic resonance imaging) scans are an exceptional representation of a claustrophobic condition, as they depict a constrained environment that may induce claustrophobic emotions in individuals who have never experienced comparable symptoms. Medical disciplines that frequently employ magnetic resonance imaging (MRI) apparatus encounter a financially and time-consuming situation due to the frequent delays caused by claustrophobic responses, which may lead to claustrophobia. MRI equipment is employed for research and examinations.[4]

EPIDEMIOLOGY OF CLAUSTROPHOBIA

Claustrophobia is an anxiety disorder that affects 15% to 37% of the worldwide population.[5]

Despite this, claustrophobia affects just approximately 3% of individuals globally. 2007 European research evaluated multiple researches from several organizations and found that statistics on claustrophobic prevalence throughout those receiving magnetic resonance imaging (MRI) varied between just one percent and fifteen percent, with a typical percentage of 2.5 percent of individuals needing anesthesia or becoming unwilling to undergo scanning because of tightness.[6]

THE SIGNS AND SYMPTOMS OF CLAUSTROPHOBIA

One type of anxiety problem is claustrophobia that is distinguished by its signs and symptoms. Often these signs first show up in children or adolescent. It is believed that the primary symptom of claustrophobia is the dread of asphyxia. Automobiles, buses, aircraft, railroads, tunnels, underwater caverns, cellars, elevators, and caves are among the many examples. The possibility of being confined in a small area, having trouble breathing, or running out of oxygen can all cause anxiety. Gersley, Erin.[15] It is not frequently the small area that induces this sensation; rather, it is the fear of what may transpire if you are left there.[16]

A person may begin to experience the following when their anxiety levels reach a specific level:

- Chills or a sensation of perspiration
- Light headedness, fear, and bouts of fainting
- Hyperventilation
- Choking sensation
- Confusion
- Dry mouth
- Hot flashes
- Moving as well as a sensation of the stomach's "butterflies"

- Breathing difficulties and chest discomfort
- A strong want to go to the bathroom
- Elevated cholesterol levels and rapid heart rate

Fear of disease Claustrophobia is typically diagnosed during a visit for other anxiety-related conditions. Meeting certain requirements is a prerequisite for the diagnosis of some phobias. The following are a few of the criteria an inexhaustible or crippling apprehension that is precipitated by the anticipated or actual occurrence of a particular situation.

- The practice of avoiding a disliked thing or circumstance, or the tendency to face the issue with uneasiness or fear
- Adult patients' recognition that the perceived threat or danger is the cause of their dread. The person's everyday life and relationships are hampered by their avoidance of a circumstance or item (PTSD).[17]

PATHOPHYSIOLOGY

Although the exact processes of claustrophobia are not fully known, they are believed to be associated with pathways connected to anxiety in general. Extreme fear and panic are produced by the body's exaggerated reactivity to small or confined spaces, which is a hallmark of various diseases of anxiety like claustrophobia. The signs of anxiousness, such as those connected to claustrophobia, are thought to result from abnormalities in the regulation of the CNS. Both physiologically and emotionally, this imbalance shows up, raising sympathetic arousal. The noradrenergic and serotonergic neurotransmitter systems in particular are important in controlling these reactions. In general, elevated anxiety and terror reactions have been linked to an underactive serotonergic system and an overactive noradrenergic system. This imbalance may be a factor in the intense fear and anxiety that people who have claustrophobia feel. Multiple neuronal circuits located in various brain areas control the interplay between these systems, which impacts both the emotional response to physiological arousal and the perception of that arousal. It is theorized that in claustrophobia, the fear response may result from increased stress and alertness caused by hyperactivity in the noradrenergic system, while decreased serotonergic activity may restrict the ability to modulate these anxiety signals, intensifying feelings of misery. It also seems that corticosteroid modulation contributes to anxiety disorders, such as claustrophobia. Corticosteroids have the ability to change neural pathway activity, which can impact how the brain processes fear-inducing cues and how people behave under stressful situations. This might help to explain why people who have claustrophobia becoming more afraid of small places. Cholecystokinin (CCK) is an additional neurotransmitter linked to the control of emotional states. Its interactions with other neurotransmitter systems may also affect the anxiety and panic that accompany claustrophobia episodes. Neurotransmitter equilibrium is fragile; modifications to a single system can cause Alterations in other because of comprehensive comments systems. Gamma-aminobutyric acid (GABA) and serotonin are inhibitory neurotransmitters that might lessen stress reactions. Claustrophobia is characterized by a heightened fear response that may be a result of dysregulation within these systems. These neurotransmitter systems have consequently emerged as important targets for therapeutic approaches meant to lessen sensations of anxiety and panic.[18] From fig.1, both hippocampus and amygdala are important limbic system nuclei, and hippocampus is essential for language memories and emotion connotations. Fear responses are influenced by anatomical connections between these areas; the amygdala processes sensory information and transmits it to the central core. The stress hormones are released by hypothalamus, while defensive and analgesic reactions are triggered by the periaqueductal gray matter.

Impact of stress on claustrophobia and modulation of neurotransmission

From fig.2, data from a number of neuroscience disciplines point to the primary root of anxiety-related disorders, including claustrophobia, as an incapacity to alter circuits in the brain that control feelings in reaction to possibly dangerous situations. Comprehending the proposed regulation of emotional responses is especially beneficial, as it creates avenues for the advancement of behavioural, pharmaceutical, and psychological treatments for claustrophobia, and aids in the explanation of the ailment within a more comprehensive framework of aberrant salience. The amygdala is involved in bottom-up activation in these circuits, which signals. The existence of perhaps dangerous situations, such as confined spaces that trigger claustrophobic reactions, and mechanism of top-down control originating in the cortex of the prefrontal, which evaluate and communicate the stimuli's emotional meaning. Greater efficacy in treating claustrophobia may result from better understanding of the factors controlling these brain systems. γ-aminobutyric acid-ergic (GABAergic) interneuron inhibitory networks are thought to include the circuits of the amygdala, making this neurotransmitter essential for regulating anxiety reactions, such as those observed in claustrophobia. The primary classes of anxiolytic drugs target the

GABAA receptor's allosteric regions, which permit precise control of amygdala cell inhibition. However, in pathological anxiety conditions, this neuronal inhibition is downregulated. such as claustrophobia, presumably because of differences in the subunit makeup of the GABAA receptor or inside the amounts of modulators of these allosteric sites that occur naturally. Additionally, stress as well as anxiogenic stimuli, such as the anxiety induced by claustrophobia, directly affect the brain's production of neurosteroids, which act as GABAA receptor allosteric modulators. The GABAA receptor-neurosteroid axis involves a desirable objective area controlling claustrophobia because it can assist manage the heightened fear response when exposed to restricted or enclosed environments, as stress regulates the synthesis of neurosteroids.[19]

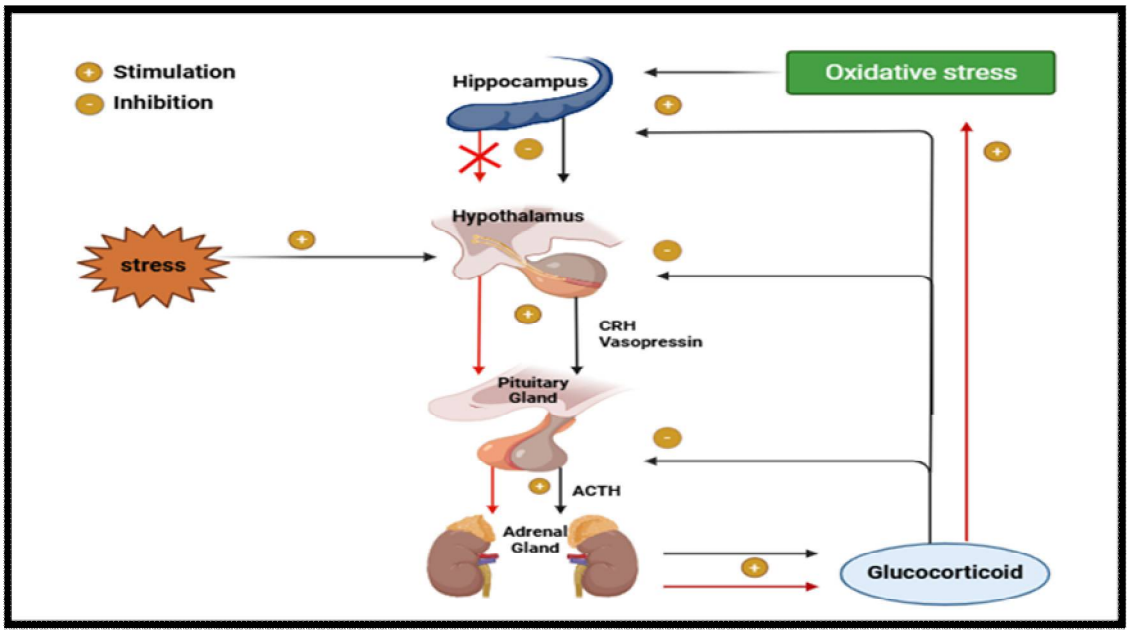

Fig.1 Pathophysiology of anxiety

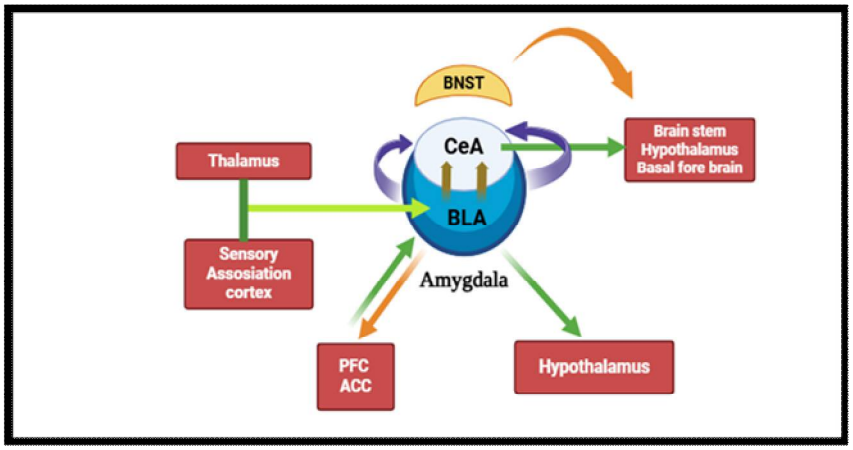

Fig.2 Modulation of neurotransmission

Mechanism

The human brain is a very sophisticated organ that serves as the nervous system's hub. The amygdala is the brain region that stores and expresses fear training, whereas the locus ceruleus is the portion of the brain that initiates a reaction to danger.[20] The amygdala detects danger and tells us to run when neurotransmitters in the locus ceruleus detect increased activity or hyperactivity. Therefore, when the amygdala becomes active, it triggers an alert that causes the heart to beat more quickly, the respiration to quicken, and all the physiologic elements of the fight-or-flight response to become active. One of the most significant emotional processes with strong neurological foundations is anxiety. Despite its lack of clarity, the neurochemistry of anxiety has become a significant field of study that has produced novel methods for treating anxiety. In the brain, an excess or deficiency of neurotransmitters can lead to anxiety. The brain produces a variety of neurotransmitters, including glutamate, dopamine, adrenaline, endorphins, gamma

amino butyric acid, serotonin, acetylcholine. Most knowledge has been derived from research on the effects of anxiolytics, or medications that reduce anxiety. The data point to the malfunction of one or more neurotransmitters and their receptors as the root cause of anxiety. The serotonergic system, the butyric acid gamma amino pathways, noradrenergic mechanisms, and neuropeptides have been the main foci of recent research on anxiety disorders.[20] Adenosine and cholecystokinin may have a part within the genesis of worry, according to new investigation, and medications which have anxiolytic properties might interact with these neurotransmitter.

Gamma amino butyric acid (GABA)

The human brain contains gamma amino butyric acid (GABA), one of the primary inhibitory neurotransmitters and a growing body of research indicates that GABAergic processes play a unique role in the neurophysiology of anxiety.[9] The brain's natural stress reliever, GABA serves as a "brake" on the neural circuitry under stress by regulating neuronal excitability.[21]

The decarboxylation of L-glutamate results in the formation of GABA. The human brain contains three distinct varieties of GABA receptors: GABAA, GABAB, and GABAC.

- GABAA receptors are ionotropic receptors that are ligand-gated.
- GABAB receptors are metabotropic receptors that are G-protein coupled and span seven transmembrane domains.
- The physiologic function of GABAC receptors has not yet been elucidated.

From fig.3, the GABAA receptors are responsible for rapid mood changes, such as anxiety, panic, and the stress response, and they modulate the neuronal excitability and mediate fast inhibitory synaptic transmissions. Sedating medications, including benzodiazepines, barbiturates, neurosteroids, and ethanol, target GABAA receptors. The development of anxiety is linked to the alteration of the influx of chloride ions within this receptor complex. GABA levels are elevated as a result of the selective enhancement of GABA-mediated transmission by all of the most frequently used anti-anxiety medications (benzodiazepines, barbiturates, and ethanol.[22] The GABAA receptors are responsible for rapid mood changes, such as anxiety, panic, and the stress response, and they modulate the neuronal excitability and mediate fast inhibitory synaptic transmissions. Sedating medications, including benzodiazepines, barbiturates, neurosteroids, and ethanol, target GABAA receptors. The development of anxiety is linked to the alteration of the influx of chloride ions within this receptor complex. GABA levels are elevated as a result of the selective enhancement of GABA-mediated transmission by all of the most frequently used anti-anxiety medications (benzodiazepines, barbiturates, and ethanol).[22]

Serotonin has been recognized for a long time as a neurotransmitter that is involved in the regulation of emotional states. At least four of the 14 or so mammalian serotonin receptor subtypes that have been described have been associated with anxiety in a variety of animal models.[24]

From fig.4, Serotonin is produced by the conversion of L-tryptophan to 5-hydroxytryptophan, which then crosses the blood-brain barrier and is subsequently degraded to 5-hydroxytryptamine (5-HT), which is commonly referred to as serotonin. It has been reported that anxiolytic effects can be induced by reduced levels of serotonin.[25]

The pharmacological specificities, anatomical distribution, and function of the brain serotonin receptors have resulted in a diverse array of subtypes.[26] The serotonin 1A receptor subtype (5-HT1A) is an auto-receptor that is placed pre-synaptically on serotonin neurons and is one of the receptor subtypes that are associated with anxiety. This receptor suppresses the synthesis and secretion of serotonin when activated.[26]

A 5-HT1A receptor agonist, buspirone, has anxiolytic effects in animals and is beneficial for the treatment of generalized anxiety disorder, but it is not effective in the treatment of panic disorder. Buspirone, in contrast to benzodiazepines, has a delayed onset of action and must be administered for up to several weeks before a significant reduction in anxiety is observed. It does not possess sedative, anticonvulsant, or muscle-relaxant activity, and it does not have a significant addiction liability [26],[27] The 5-HT2A, 5-HT2C, and 5-HT3 receptors are additional serotonin receptors that may be implicated in anxiety. Some animal models demonstrate anxiolytic effects when 5-HT2A receptor antagonists, such as ritanserin, are administered.[28],[29]

The 5-HT2C receptor is also blocked, which results in an anxiolytic effect in animals. The 5-HT2A receptor agonist m-chlorophenyl piperazine (m CPP) has been demonstrated to induce anxiety in control subjects and patients with a diverse array of anxiety disorders in humans [26].

Ondansetron, an antagonist of the 5-HT3 receptor, has been documented to have an anxiolytic effect in certain animal models.[30] The selective serotonin reuptake inhibitors (SSRIs) have demonstrated efficacy in the treatment of obsessive-compulsive disorder and hysteria. Therefore, the discovery that a

number of medications that are beneficial for panic disorder are not beneficial for generalized anxiety disorder and vice versa implies that the fundamental mechanism of these processes is distinct.[26]

Norepinephrine - Increased norepinephrine levels aid in the fight-or-flight response during crises. However, persistently high levels cause the individual to experience worry, fear, irritation, and other negative emotions even when there is no threat to them. Thus, adrenergic receptor agonists and antagonists are being used to study the function of catecholamines in anxiety.[26]

Neuropeptides - Neuropeptides have been linked to the control of complicated behavior, such as psychopathology and anxiety-related behaviors.[31],[32] Substance P, corticotropin-releasing factor, neuropeptides Y, vasopressin, oxytocin, somatostatin, cholecystokinin, and galanin are among the neuropeptides that appear to be relevant in anxiety, according to mounting data.[33],[34]

Molecular biology techniques have also been employed to investigate the behavioral effects of these peptides. These techniques include central administration of antisense sequences, which obstruct the translation of peptides or peptide receptor proteins, overexpression of peptides in intact animals, and the creation of knockout mice devoid of specific peptides or peptide receptors.[26]

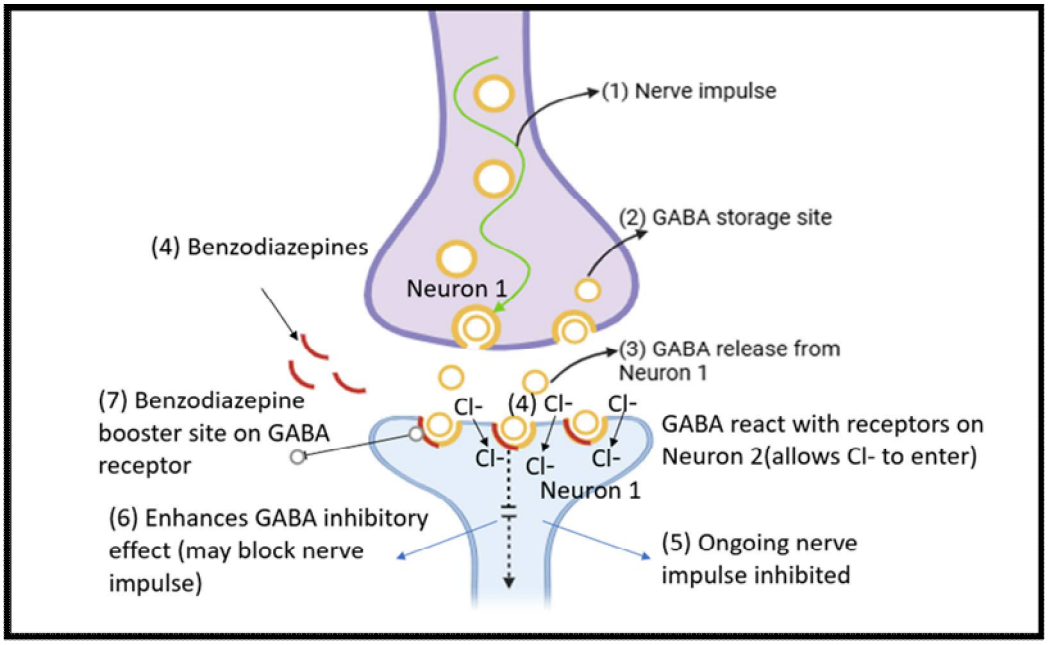

Fig.3 Schematic representation of GABA receptor [23]

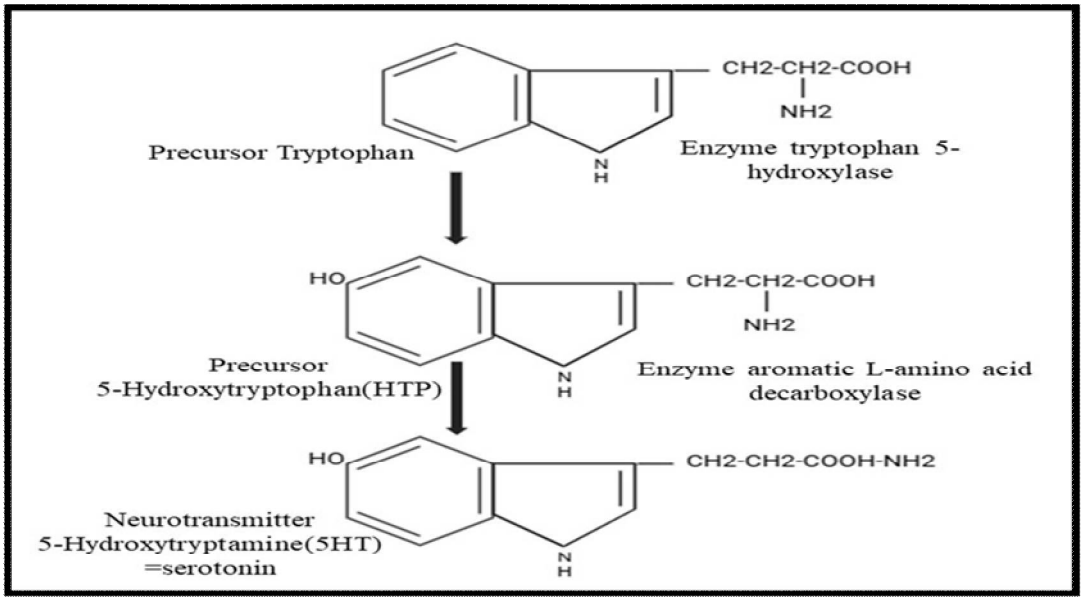

Fig.4 Metabolic Pathway of Serotonin Production

CAUSES OF CLAUSTROPHOBIA

Claustrophobia may be precipitated by situations such as: The patient may be claustrophobic if they have experienced anxiety about being in a confined room or congested place in the past six months or have avoided these situations for this reason. It can be precipitated by a diverse array of stimuli or environments, such as hotel rooms with shuttered windows and closed doors, windowless rooms, and crowded elevators. Clothes with a tight neck, compact cars, and beds that are locked outside can also make people feel claustrophobic. Panic attacks are prevalent, and it is generally classified as an anxiety disorder. The onset of claustrophobia has been associated with a genetic predisposition to fear confined spaces, classical conditioning, or a reduction in the size of the amygdala.

1. Fear that has been prepared
2. Amygdala
3. Conditioning experiences
4. Classical conditioning

The anxiety of being confined to a tiny space is irrational. Even if the majority of claustrophobic individuals who are in a room without windows are aware that they are not in danger, they will be frightened, potentially incapacitated, and many will have no explanation for their fear.

Recurring fear

Claustrophobia is not entirely a conditioned or taught phobia, as indicated by specific studies. The room is sufficiently ventilated; however, it is suspected that a physiological issue, such as inadequate tracheal discharge, is preventing the air from flowing freely. As stated by Erin Gersley in "Phobias: Causes and Treatments." Claustrophobia may be classified as a "broad distribution" condition due to its symptoms, which include an early onset, evident ease of learning, and non-cognitive characteristics.[35] "Claustrophobia may be a vestige of an evolutionary survival strategy, a dormant dread of imprisonment and/or asphyxia that was previously essential to humanity's survival and could be reawakened at any moment." [36] In the past, antagonistic situations would have required this type of pre-programmed fear. Consequently, the human mind has developed the capacity to "efficiently fear condition particular classes of threatening stimuli.".[37]

Amygdala:

From fig.5, One of the tiniest and most potent parts of the brain is the amygdala. The induction of the fight-or-flight response or fear training requires the amygdala. The initiation of the reaction of fight or flight occurs when a stimulus is connected to a risky situation. Cheng argues that the basic element of anxiety is the fight-or-flight reaction.

The following activities are taken by the amygdala to start a fight-or-flight response: Fear is linked to the amygdala's anterior nuclei. The pace of breathing, physical arousal, adrenaline release, blood pressure, pulse rate, behavioral anxiety reactions, and defensive behaviors like freezing are all influenced by the signals that nuclei send to other nuclei. The phrase "autonomic failure" refers to these responses that occur during a panic episode. According to the research by Fumi Hayano, people with panic disorders have smaller right amygdalas.[38]

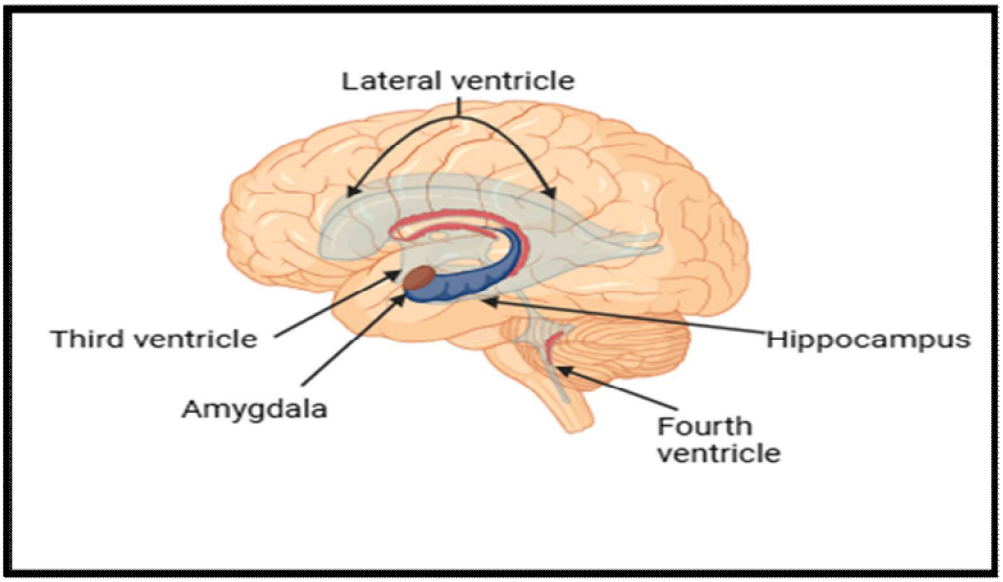

Fig.5: Structure and location of amygdala

Experiences in conditioning

The following are some typical situations that might cause claustrophobia in babies (or adults):

- A child is confined to a pitch-black chamber, unable to locate the entrance or light control.
- A infant is confined to a closet;
- A child is placed in a cage.
- A infant drowns after plunging into a deep pool.
- A child becomes disoriented and disoriented in a bustling environment due to their separation from their parents.
- A child is unable to exit a barrier after their cranium becomes trapped between the bars.
- A child is either confined or unable to escape after falling into a crevice.
- A child is left unaccompanied in their parents' vehicle, whether it be a car, pickup, or van.

According to one source, the phrase "past experiences" can refer to the moment of birth.

John A. Speyrer's "Claustrophobia and the Fear of Death and Claustrophobia" leads the reader to this conclusion. "Dying" characterizes birth trauma as "one of the most horrible experiences we may have during our lives." The neonate develops claustrophobia during this helpless period.[39] It is anticipated that approximately 60 million magnetic resonance imaging (MRI) examinations will be conducted annually worldwide. Furthermore, 25% of patients reported experiencing moderate to severe anxiety during the surgery. MRI-related effects included minor apprehensions regarding panic episodes or claustrophobia.[40] While magnetic resonance imaging (MRI) is generally considered to be a safe procedure, the prolonged lying down in a constrictive space may induce significant anxiety or claustrophobia in some individuals.[41] Claustrophobia is estimated to prevent approximately 2 million MRI examinations from being conducted annually. This has a substantial financial consequence.[42]

Fear of confinement and fear of suffocation are regarded to be the root causes of the condition.[43]

Suffocation fears will arise if,

a) Individuals presume that the room's oxygen supply is inadequate.
b) Access to air is obstructed or disrupted by external factors, such as the use of a respirator for respiration.

The room is sufficiently ventilated; however, it is suspected that a physiological issue, such as inadequate tracheal discharge, is preventing the air from flowing freely.[44]

Conditioning in the traditional sense

Claustrophobia arises when the mind associate's danger with confinement. Usually, a traumatic experience during childhood is the cause.[45] Although the onset might happen at any period in a person's life, it can happen at any time. In order to establish an enduring impression on the mind, this form of meeting may occur on multiple occasions or only once.[46] In a study conducted by Lars-Göran St., the majority of claustrophobic patients reported that their anxiety had been alleviated "as a consequence of a conditioning experience; you possess this ability." Claustrophobia appears to be the result of past events most of the time.

DIAGNOSIS

The fear of being trapped in a small area is known as claustrophobia. It usually results in a severe panic attack and is typically categorized as an anxiety condition. Sometimes it is confused with cleithrophobia. (The anxiety of being confined.) [47] Usually, claustrophobia is diagnosed during a consultation about other anxiety-related disorders. To diagnose particular anxiety disorders, certain requirements must be met. Included are the following criteria:[48] An unending obstructive or overwhelming fear brought on by the presence or expectation of a certain circumstance

- An anxious reaction to a stimulus that is displayed might result in an outburst, clinging, crying, or other behavior in children, or it can cause panic attacks in adults.
- Adult patients' recognition that their apprehension is a result of the anticipated threat or peril [49]
- Engaging in procedures to avoid a detested object or circumstance, or a propensity to confront the situation with discomfort or anxiety
- The individual's avoidance of the object or circumstance disrupts their daily life and relationships.
- The phobia is persistent, typically lasting for six months or more.
- The symptoms cannot be attributed to other underlying mental conditions, as post-traumatic stress disorder (PTSD) or obsessive-compulsive disorder (OCD).

TREATMENT

Recent available treatment option was given in table.2: Treatments and therapies used in claustrophobia. Where few other options elaborated below.

Other therapies

Claustrophobia arises when the mind links cramped areas to danger, usually as a result of traumatic events that happen throughout childhood. These experiences create a persistent fear response by conditioning the brain to view confined areas as dangerous. According to research, the majority of cases are caused by prior conditioning events, underscoring the important part early trauma plays in the emergence of this anxiety disease.

Medication used

SSRIs, anxiolytics, beta-blockers, and antipsychotics treat claustrophobia differently. SSRIs increase serotonin levels for long-term control, anxiolytics provide quick relief, beta-blockers reduce physical symptoms, and antipsychotics are reserved for severe cases.[61]

Table.1: Risk factors of claustrophobia

Factor	Description
Traumatic Childhood Events	Experiencing confinement, bullying, or abuse as a child can increase the risk of developing claustrophobia.[7]
Parental Influence	Growing up with a parent who has claustrophobia can lead to the development of the condition.[8]
Triggering Events Later in Life	Events like being stuck in an elevator or experiencing airplane turbulence can trigger claustrophobia.[9]
Amygdala Size	The size of the amygdala, which controls anxiety, may influence a person's vulnerability to claustrophobia.[10]
Personality Traits	Certain personality traits, such as being naturally tense or anxious, can increase the likelihood of developing claustrophobia.[11]
Age	Claustrophobia is more likely to manifest before the age of 25.[12]
Genetic Factors	A specific genetic mutation may elevate the likelihood of developing claustrophobia.[13]
Other Mental Health Conditions	Having another anxiety disorder or mental health condition can increase the risk of acquiring claustrophobia.[14]

Table.2: Treatments and therapies used on claustrophobia

Therapeutic Approach	Description	Effectiveness	Key Findings
Cognitive Therapy	Focuses on changing distorted beliefs or mis-understandings linked to specific fears, reducing anxiety and avoidance.[50],[53]	Reduced claustrophobic patients' fear and negative connotations by an average of 30%.[51],[52]	S.J. Rachman's research demonstrated significant reductions in claustrophobia, highlighting its effectiveness in altering beliefs about feared situations, such as convincing claustrophobic patients of elevator safety.
In Vivo Exposure54	Gradual exposure to fears, starting with mild levels and progressing to more serious ones.55	Highly effective for reducing claustrophobia and similar phobias.56	S.J. Rachman's studies demonstrated it as the most notable approach for significant fear reduction, e.g., starting in a lift and advancing to an MRI setting.
Exposure to Detection 57	Simulates internal bodily experiences of anxiety in a controlled setting to reduce negative thoughts.58	Reduced anxiety and unfavorable implications by approximately 25%.	S.J. Rachman's 1992 study showed moderate effectiveness, though less significant than cognitive therapy or in vivo exposure.
Intranasal Midazolam Spray	Examined on 54 individuals undergoing MR imaging, with strict inclusion and exclusion criteria. Administered 4 mg using a spray bottle.	Effectively reduced anxiety and sedation levels, improving scan quality.59	Used Spielberger State-Trait Anxiety Inventory and Visual Analogue Scale for anxiety measurement. Physiological condition of participants was monitored, and their sedation levels were reassessed before scanning on a 1.5-T Signa Advantage scanner.
Deep Breathing, Meditation, Muscle Re-laxation60	Techniques involve slow breathing, mindfulness practices, and progressive muscle relaxation to improve focus and promote calmness.	Highly effective for reducing stress, anxiety, and tension.	Deep breathing lowers cortisol and heart rate; meditation enhances emotional regulation; muscle relaxation reduces tension-related symptoms.

Table.3: Differentiating Claustrophobia from Other Psychological Conditions

Aspect	Claustrophobia	Other Psychological Conditions
Specific Trigger	Confined or enclosed spaces (e.g., elevators, small rooms).	**GAD**: Anxiety is generalized and not tied to specific triggers.[62] **Social Anxiety**: Triggered by social interactions or fear of judgment.[63]
Nature of Fear	Irrational and intense fear of confinement or restriction.	**Social Anxiety**: Fear of social situations.[63] **Agoraphobia**: Fear of being unable to escape in situations like crowds or open spaces.[64]
Symptoms	Immediate panic symptoms (breathlessness, sweating, rapid heartbeat) when in confined spaces.	**Panic Disorder**: Panic attacks occur unpredictably without a specific trigger.[65] **GAD**: Persistent worry and physical symptoms across various contexts.[62]
Onset	Often linked to a traumatic event involving confinement.	**PTSD**: Related to broader traumatic events, with symptoms like flashbacks and hypervigilance.[66]
Behavioral Response	Avoidance of confined spaces, disrupting daily routines.	**OCD**: Avoidance driven by obsessive thoughts and compulsive rituals.[67] **Agoraphobia**: Avoidance of situations perceived as difficult to escape.[64]
Cognitive Patterns	Focused on fear of physical entrapment or suffocation.	**Agoraphobia**: Broader fears about safety in Various environments.64] **Depression/Chronic Anxiety**: Generalized distress not tied to specific situations.[68]
Duration and Persistence	Anxiety subsides once the individual leaves the confined space.	**Depression/Chronic Anxiety**: Emotional distress is persistent and pervasive.68 **PTSD**: Symptoms persist as flashbacks and ongoing hypervigilance, regardless of context.[66]

CONCLUSION

Claustrophobia is complicated yet spreaded over all ages group people. Patient with this condition faces many challenges as lack of awareness, no proper diagnosis, and limited treatment options are main characteristic. Pathophysiology of this condition involve the imbalance of neurotransmitter like GABA, Serotonin, Nor-adrenaline, Cholecystokinin. Which affects the proper functioning of various sites in brain like amygdala, hippocampus, prefrontal cortex, hypothalamus, periaqueductal gray. In this review we simplify the progression of claustrophobia, various associated risk factors and available treatment options. We suggest that more research is required for the treatment of this condition.

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CONFLICT OF INTEREST

All authors declared no conflict of interest.

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