

Neuropsychiatric-Imaging in the Depressed Occipital Lobe with A Suicidal Link and Pharmacotherapy Outcome Among Pediatric Age Group and Adolescents

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ABSTRACT

Background: A Systematic review is defined as a type of literature review which critically appraises and synthesizes the best existing prove to initiate a study of conclusion by means of resolving specific clinical issues. Therefore, this study is a systematic review which determines the pathogenesis of depression and correlation with suicidal ideation and its relationship with occipital lobe as well as establishing a preventive measure for depression and suicidal ideation in children of pediatric age group as well as the adolescent.

Objective: Suicidal ideation is common among pediatric age group with depression worldwide and has been known to be the most leading cause of suicidal ideation, this article has been narrowed down to investigate the link between occipital lobe and neurobiology factor in patients with depression and successful suicidal attempt within past. Five (5) year of study.

Method: A systematic assessment of the electronic comprehensive article was conducted July 2018 using various databases, PubMed, Medline, Cochrane Library and Psych INFO listing articles with keywords; depression, suicide, occipital lobe, Serotonin reuptake inhibitors (SSRIs), HPA axis, neurotransmitters and finally 50 relevant studies were extracted from PubMed database. The quality of systemic review was evaluated with the use of Assessment of Multiple Systematic Reviews (Mod-AMSTAR) tool, formed on the AMSTAR scale including the PRISMA Checklist.

Result: Memory display a substantial role in the risk of suicidal acts in the same vein, defects in cognitive inhibition has been linked with the inferior frontal gyrus, thalamus, orbitofrontal cortex and parietal cortex leading to depression and the aggravations predisposes to suicidal ideation.

Conclusion: Our finding has given us fact and hypothesizes that state-related defects may predispose to trait-like cognitive impairments to facilitates to suicidal vulnerability, which may impose various therapeutic approaches for the prevention of suicidal attempts, further brain damage as well as PTSD in pediatric age groups and adolescents.

Keywords

Depression, Suicide, Occipital Lobe Serotonin Reuptake Inhibitor (SSRIs), Neurotransmitter, HPA axis.

Case Illustration

A 13 years old female who was apparently well until when she

took 11 counts of Trazadone at a time which she found from one of mom's prescriptions, and she was found comatose with an evidence of seizure with no history of vomiting or postictal symptoms. Her legs were stiff, and eyes were rolling, dad called the ambulance and was brought to the ER. 45 mins after resuscitation, with an extensive evaluation she explained the reason behind her

suicidal attempt saying, “I don’t like everything about my look” she, however, reported she took those pills to kill herself, Pt was well managed and diagnosed with (F41.9) Anxiety abnormalities, undetermined and (F32.9) (MDD) Major depressive disorder, single episode, unspecified. With two (2) weeks of follow-up appointment at the clinic. Discharged medication Discharged medication Serotonin reuptake inhibitors (SSRIs).

The above mentioned is a hypothetical case for the reader to understand the typical clinical presentation of depression and its risk to suicidality. So, this show how pressing for the need of statistic is needed. If otherwise, there will be a higher morbidity also with higher mortality rate and a loss to the medical setting mostly the neuro-psychiatric field (Referred to Table 1).

Patient consent

Was not included in this study, reason been that the above case illustration was a hypothesis without the patient’s information, such as patient’s name, address, laboratory results, images, or any traced essentials of individual mentioned in these studies. Therefore, elicit permission on this study of patient’s consent is not required.

Introduction

Depression is so hazardous that it can deprive a person’s capability to enjoy and explore life and hence predisposes to declination or incapacity to ensure very little day-to-day tasks. There are various categories of depression; (1) mild, (2) moderate and (3) extreme/ severe depression such as psychotic depression where a patient presents with features like delusions and/or hallucinations. Depression, however, can be complicated upon interwoven of diseases with various mental challenges for example; anxiety disorders, which includes panic agoraphobia disorder, generalized anxiety disorder, severe phobias, and, (PTSD) Post-traumatic stress disorders as well as (O C D) Obsessive-compulsive disorder.

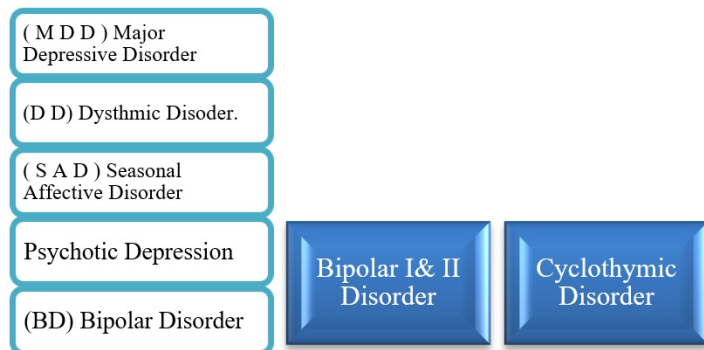


Figure 1: Depression types.

The goal of this literature is to establish the neuropathogenesis of depression and correlation with suicidal ideation and its relationship with occipital lobe as well as establishing a preventive measure for depression and suicidal ideation in children and adolescent. Hence this literature shed more knowledge to the readers about all doubts on;

- What is the definition of depression and suicide?

- What is the neuropathogenesis of depression and suicidality?
- What role do inflammation and oxidative stress play in the pathophysiology of MDD?
- If the suicidal behavior is transmissible, with the risk of link transmission of susceptibility traits?
- Neuroimaging finding of occipital lobe and if it is linked to depression and suicidality?
- What is the risk of depression and suicide?
- If psychotherapy is preferable to pharmacotherapy?
- What is the latest pressing need to prevent depression from aggravating to suicidality?

1.	At least one symptom is anhedonia or depressed mood
2.	Weight gain/loss
3.	Insomnia/hypersomnia
4.	Psychomotor agitation /retardation
5.	Feeling of guilt or hopeless
6.	Lack of concentration /difficulty completing a task
7.	Suicidal attempts or ideation
Individual must present with five or more symptoms of the above table (2) daily/ most of the day for at least 2 weeks to meet MDD diagnosis.	

Figure 2: D S M - IV-T R Criteria for (MDD) Major Depressive Disorder.



Figure 3: Clinical Systems of depression.

Methods

A systematic assessment of the electronic comprehensive article was conducted July 2018 using various databases, PubMed, Medline, Cochrane Library and Psych INFO listing articles with keywords; depression, suicide, occipital lobe, Serotonin reuptake inhibitors (SSRIs), HPA axis, neurotransmitters and finally 50 relevant studies were extracted from PubMed database. The quality of systemic review was evaluated with the use of Assessment of Multiple Systematic Reviews (Mod-AMSTAR) tool, formed on the AMSTAR scale. Which includes detailed information on the article methodology for systematic review only.

Inclusion and exclusion criteria

Inclusion

A Systemic review is defined as a type of literature review which critically appraises and synthesizes the best existing prove to initiate a study of conclusion by means of resolving specific clinical

issues. All publications are within the last 5 years with English language and humans' studies. There remained no limitations on the type of clinical setting or study populations.

Exclusion

Articles published before 5 years, animals, and in-vitro studies.

Search strategy

PubMed, Medline, Psych info, Cochrane Database of Systemic Review (CDSR) was conducted with the reference listed of important reviews search.

Study selection and data extraction

The studies were independently scanned, with selected eligible systematic review giving to the inclusion and exclusion criteria. Any disagreement in the though scanning of data collection was deliberated, resolved by consensus and third reviewer (HT). The impact factor (IF) of the review was retrieved by searching the journal citation report in PubMed.

Modified AMSTAR scale of systemic reviews.

Domain	Review A	Review B	Review C
Search Keywords	YES	YES	YES
Search years	YES	YES	YES
Two (2) electronic sources searched	YES	YES	YES
Comprehensive study search	YES	YES	YES
Duplicate study	YES	YES	YES
Inclusion criteria	YES	YES	YES
Exclusion criteria	YES	YES	YES
Two reviewers' screening	YES	YES	YES
Independent screening	YES	YES	YES
Consensus disagreements	NO	NO	NO
Databases type/s	YES	YES	YES
Independent data extraction	YES	YES	YES
Individual Study quality	YES	YES	YES
Heterogeneity	YES	YES	YES
Publication bias	YES	YES	YES
Evidence tables	YES	YES	YES
Funding sources	NO	NO	NO
Conflict of interest	NO	NO	NO
Publication restrictions	NO	NO	NO

Figure 4: Information on mod-AMSTER of the reviews article including methodological quality.

The is a visual map-out of the systemic review article, designed to be answered as a "Yes" or "No" response.

Study search questions	Study selection questions	Data synthesis & evaluation base questions
Did you describe your search term?	Was duplicate study reported	What type of databases was described?
Did the report include search years?	Was the inclusion criteria described?	Were data extracted by two independent reviewers?

Were there two or more electronic databases searched?	Was the exclusion criteria described?	Was the individual study quality assessed?
Was a comprehensive study search achieved?	Was screening assessed by two reviewers for inclusion criteria?	14. Was heterogeneity study results assessed between qualitative & quantitative study?
	Was there an Independent screening?	Was publication bias assessed qualitatively and/or quantitatively?
	Was there a consensus procedure for disagreements in study selection?	Were attributes of inclusion criteria described in the evidence table?
		Were there funding sources?
		Any included record of conflict of interest?
		Were there any restrictions for publication?

Figure 5: The detailed questionnaire is displayed with different characteristics of information on modified AMSTAR (mod-AMSTER) of the above map-out table of the SRs article.

Quality assessment/ethical consideration

The entire data collected was lawfully obtained, all data were directly from PubMed, with a journal impact factor greater than 1. Most data were peer-reviewed, and all articles encompassed were published within the last 5years. Literature was assessed using the modified AMSTER based on the AMSTAR scale. AMSTER is an easily accessible, authenticated implement for computing the methodological quality or excellence of Systematic Reviews articles.

Minimum evidence-based set items with a wide display of systemic reviews and analyses focusing on assessment of the complete report.

Results / PRISMA-flow

Reviews eligible articles were rated as higher quality and minority weak studies. Reviews were published in English language, a review published in journals with a higher impact factor was linked with an increased mod-AMSTER score. The PRISMA- flow was used in the current literature to determine the study collection method of the figure above (4) The search strategies acknowledged a total number of 24,880 with various databases keyword search results. (PubMed, Medline, Cochrane), after filtration, studies remained limited to Systemic review, clinical-trial, as well as observational studies.

The article was equally restricted to the last 5 years and results were counted. The complete texts of the results remained screened, and relevant articles were extracted. Additional screening based on human studies were attained and (n=2688 result) articles were obtained. Duplicate articles were (n=269), total study search without filter with the three-database including all keyword (n=248890) respectively.

health. According to the World Health Organization (WHO), 350 million individuals worldwide are said to suffer from this mental disorder [1,2].

Neuropathogenesis

The Mechanism by which depression pathogenesis occur is studied in this literature. Neurotransmitters are chemical that carries messengers between nerve cells and thought, mood, including affect behavior. The pathophysiology is that the neurotransmitters release the synapses (gaps) between nerve cells to help messages travel from one cell to another with the help of Norepinephrine and serotonin. Therefore, absence or decreased level of these neurotransmitters in the brain or some part of the brain leads to depression [3,4]. HPA-Axis is a hormonal system which regulates the body response to unwanted stimuli or stress. It does that by increasing the production of corticotrophin-releasing factor (CRF) when an individual is psychologically or physically threatened. When this assault occurs, the body defense mechanism will be activated to attack the etiological agent predisposing to a higher hormone that secretes the pituitary and adrenal glands this phenomenon is the pathophysiology of depression due to over-activity of the HPA- Axis. The etiological factor of the above pathogenesis of CNS depression includes: (1). Medication (2). Illicit drugs use (3). Alcohol (4). Chronic Medical conditions such as; 4a. Diabetics 4b. Liver disorder 4c. Kidney Disease 4d. Thyroid Problems and 4e. Severe heart attack. (5). Direct Injury to the brain which includes; 5a. Trauma from accident 5b. Infection 5c. Tumor 5d. Brain abscess 5e. An Aneurysm and 5f. Stroke. These affect the neurotransmitters in the brain also the HPA- Axis which predisposes to decreased in brain activities and euphoria [5,14]. There are suggesting indication that the CNS (GABA) γ -aminobutyric acid concentrations are declined in the brain of an MDD patient. This study will review the mechanisms process that direct GABA as well as glutamate absorptions in the brain and also provide an all-inclusive critical assessment of the experimental data supporting reduced GABA neurotransmission in MDD [6,7]. A discovery was revealed by assessing the role of pathology of glial in MDD relating to a declining level of GABA concentrations with positive evidence of connection among GABA neurotransmission, neurosteroids, as well as mood disorder related to hormonal factor [8-10]. Furthermore, an investigation on the effects of pharmacological agent (GABA) on the mood was carried out and it proves that GABA compounds have complex properties that do not generally support the impression that a declining GABA neurotransmission can predispose to the etiological agent of MDD [17].

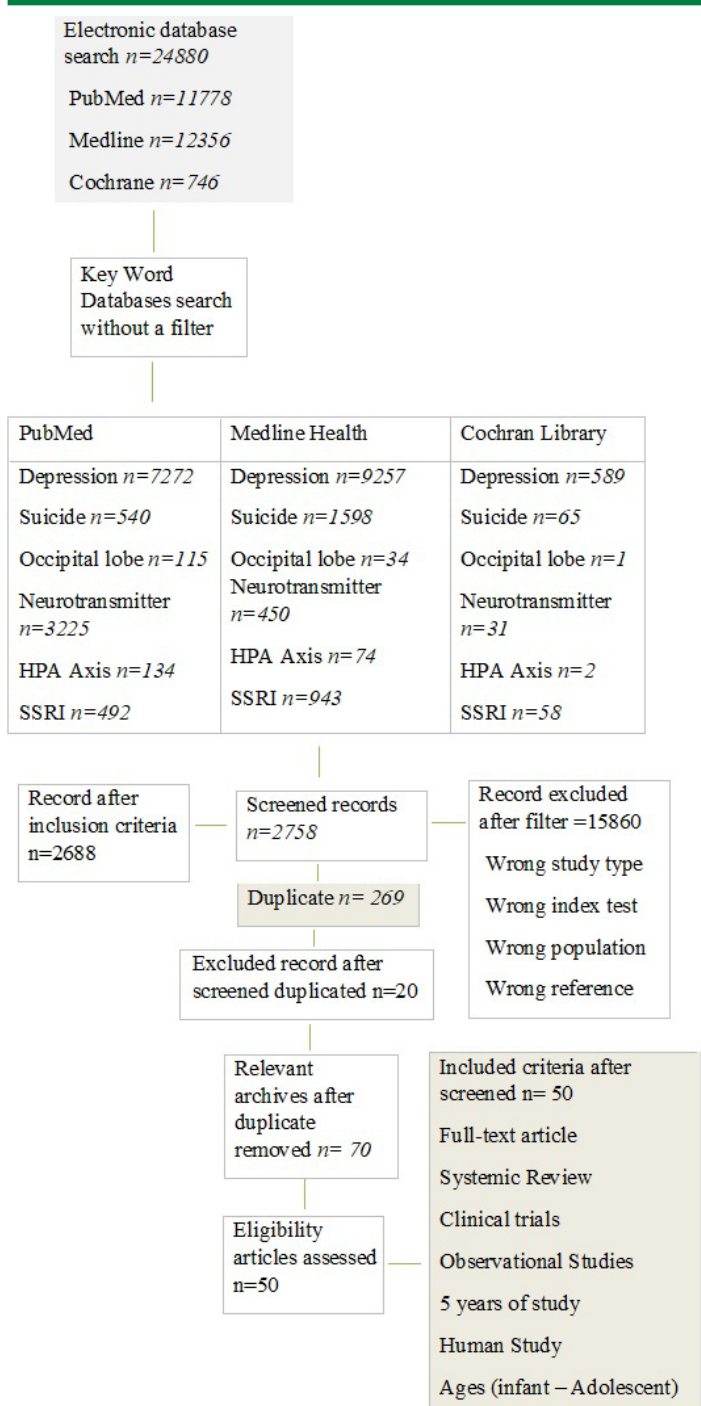


Figure 6: (PRISMA-flow chat) Preferred Reporting Items for Systemic Review and Meta-Analysis.

Discussion

Definition

Depression is in line with psychological factors which affects the mental health (code F32.9), which is initiated in the Diagnostics in addition to Statistical Manual Disorder (DSM-IV-TR) and published through the (APA) American Psychiatric Association as criteria for the classification of mental disorder. Depression is known to be a chronic disorder of mental health that results in changes in ones thought processes, mood, behavior also physical

The Link between depression, suicide, and occipital lobe

The contrary changes of occipital lobe been asymmetrical, and enlargements of lateral ventricles have been reported among individual by means of bipolar syndrome in comparison by a fit individual, signifying the various amount of occipital binding (OB) [24]. We posit the abnormalities with neural pruning or ventricular enlargement which may progress to OB, afterward predisposing one occipital lobe twisting around themselves. Though complications of these twisting lobe are still uncertain

[13,14]. The cause of suicidality is multifaceted, and the understating of its neurobiological mechanism is inadequate. The neuroimaging strategy requires a noninvasive method to explore the neural association of suicidal vulnerability in vivo study [40]. The Enigma-MDD group is a worldwide association which evaluates neuroimaging by means of clinical data from a thousand of participants composed of researchers worldwide. The analysis in a subcategory sample is (n=3097) with suicidality. The incidence of suicidality symptoms between MDD varies from 29 and 69% of cohorts' study [16,17]. The contrary changes of occipital lobe been asymmetrical, and enlargements of lateral ventricles have been reported among individual through bipolar disorder in comparison by a fit individual, signifying the various amount of occipital binding (OB). Which may apply pressure upon subcortical structures, like the hippocampus, decreased with psychiatric patients [17,18]. The incidence of OB was found among 35 individuals through BD and 36 fit individuals as per ventricular also occipital volumes. Incidence remained 4 eras greater amongst BD participants 12/35 (34.3%) than healthy participants 3/336 (8.3%) including a bigger ventricular volume (LVVs). An individual with OB has lesser left-to-right hippocampus capacity ratios, which lead us to our finding that suggest OB be linked to a left-to-right ventricular anomaly, in addition, occipital lobe volume (OLV) ratios [19,20].

Risk of link transmission of susceptibility traits

There was an elevation in several commission errors in suicidal attempter between both control groups, not excluding brain stimulation inpatient controls of suicidal attempters. There was an evidence link between brain stimulation of the left inferior portion of the frontal gyrus, medial thalamus, and depression during G O.v. No-Go, also consensual (PC) parietal cortex together with the left portion of the orbitofrontal cortex in a No-Go v. baseline, with the connotation of psychosomatic pain, suicidal ideation, and comprehensive effect. On the other hand, no account of link was found among activation and with any personal/family history of suicidality [21,22]. The quantity of brain stimulation was supported using functional magnetic resonance imaging all through the Go/No-Go response task inhibition among unmedicated 25 participants with 1 depressed middle-aged suicidality. The 22 depressed participants who were unmedicated were said to have no any personal or genetic history of suicidality. Examination of the whole-brain was investigated with SPM12 [30]. 17 healthy first-degree biological relations of suicide attempter with no account of any personal /family history of suicidal ideation, while 16 relatives of depressed participants excluding relative/ family history of suicidality, with 19 participants who are healthy controls were enlisted [16]. The irregularity of the occipital lobe presenting with one lobe been wrapped around the other which leads to occipital bending, as well as enlarged lateral ventricles, was detected in psychiatric patients in comparison with healthy individuals [23]. The Incidence of 51 MDD patients presents with occipital bending (with mean age 41.96 ± 14.00 yrs. in males), with ± 12.41 yrs. mean age 40.71 (in females), age 48 with healthy sexual related control patients with age 40.29 ± 10.23 years (in males), while (the mean age = 42.47 ± 14.25 yrs. in females) which was observed to be trice greater among MDD patients (18/51, 35.3%) in comparison

to healthy individual of 6/48 (12.5%) [24,25]. The result proposes a larger incidence with occipital bending among patients who have MDD than healthy individuals, with a different phenomenon of occipital asymmetry and occipital bending. There was an evidence of brain growth restriction due to the partial neural lopping which results in the cranial space. Also, a positive evidence of ventricular enlargement exacerbates the neural occipital curvature pattern which frequently predisposes the brain been compressed and then enforced to "Wrap" around the other occipital lobe.

Link between inflammation, depression and suicidal ideation

Pathophysiology of MDD are numerous without neglecting important point, inflammation and oxidative stress show a significant part in the pathophysiology of MDD in addition glutathione been a significant index of anti-oxidant dimension has been implicated to be the most abundant antioxidant in the human brain/ tissue which promotes oxidative stress [28]. An illustration of patients with brain trauma who has MD was N= 14, patients with brain trauma short of MD was N = 12, MD short of brain trauma is N= 26, in addition, healthy individuals with not any brain trauma or else MD was N= 23 respectively, with getting basic MRI brain scans [33] a) Brain trauma patients who developed MD have decreased size in temporal, parietal in addition lingual sections in relation towards patients without MD but with shreds of evidence of brain trauma (b) Reduced volume of temporal region was found in patients with a known history of brain trauma and MD in comparison to those with MD and without any history of brain trauma [33,34]. A clear majority of the finding was depression, 2 was on suicide, and 7 was with includes inflammatory medical conditions, Including utmost teenagers. Interleukin (IL)1 alpha-beta-2-4-6-10 and IL-1 receptor antagonist with interferon- γ , (TNF) tumor necrosis factor- α , ESR, C-reactive protein, and inflammatory cells remained analyzed diagonally. Here, however, widespread depression variance was assessed. Five of nine cross-sectional and 3of 7 longitudinally, literature with depression were initiated to have a constructive link amongst depression and inflammation. The result of the medical condition includes inflammation and depression respectively [7].

Risk of depression and suicide

Subthreshold MDD is predominant within youth and associated with emotional and social impairments that reach the stage of obtaining clinical care. These conclusions might progress to early involvement efforts intended at mitigating the adverse results linked with subthreshold MDD via the progression to full-syndrome MDD [17]. Being up-to-date the beers criteria classify SSRIs by means of hypothetically inappropriate medications in older adult was based on decrease hazard. The claim of this references is not only to weak nursing home residents, but older adults may well predispose towards variations in strength policy or clinical practice with injurious penalties. Systematic analysis of students on the related link among SSRs in addition to older adults was conducted towards inspecting the indication of risk. Twenty-six (26) studies met the inclusion criteria. A clear common study was observational which propose a link among SSRIs also falls. The path of the connection- causality or consequence cannot be differentiated from this kind of study [49].

Psychopharmacotherapy

The first-line drug of choice in the management of pediatric MDD is reported to be SSRI, meta-analysis was conducted toward observing the following: The period sequence of outcome of SSRIs; perhaps increased dose of SSRIs is link with no improved response; similarities among SSRI agents; and maybe interval and degree of outcome to SSRIs vary in juvenile and adult with MDD. Weekly symptoms were collected from trails to identify the course of pharmacological retort and SSRIs. Collective evaluation of treatment effectiveness was considered using standardized mean amongst treatment and placebo [48]. 3,004 participants were evaluated using Meta-analysis, and 13 pts, with MDD trials, were the pediatric age group. A logarithmic model indicates the higher advantages of SSRIs occurrence is in the early treatment with superlative fit in longitudinal figures 95% logarithm week (0.10) CI 00.06 -0.15, ($p < .0001$). Not any obvious link between the extreme dose of SSRI and certain SSRI mediators. SSRIs are designed with a lesser advantage in juveniles in relation to adult MDD. The management benefit in juveniles MDD remains progressively initial in treatment with an average negligible of next 4weeks of SSRI pharmacotherapy in pediatric MDD. Categorically more studies are obligatory by means of precise patient statistics to investigate the capacity of SSRI efficacy to envisage the conclusions in short-term pharmacological trials. These studies aimed to investigate and predict if the genetic polymorphisms predispose to suicidal ideation in the patient with a mental disorder [44,49].

Hence a progressive literature of suicide acknowledges the serotonin transporter polymorph-Orphism in an individual with schizophrenia, a bipolar disorder including mental disorder, there is a connection between the serotonin-transporter-linked polymorphic area and suicidal performance. Mental disorders with an advanced link of suicide were the bipolar disorder, MD, and schizophrenia. The L allele had a greater risk for suicidality. The result on the potency of SSRIs with randomized controlled trials (RCTs) and systematic reviews as the first-line treatment of MDD has been inconsistency. However, discrepancies between RCTs exhibits the dangers of bias and efficiency of SSRIs by directing a Bayesian network meta-analysis, which will be the utmost wide-ranging assessment of indication to determine the inconsistency between initial studies, among other SSRIs which included citalopram, escitalopram, fluvoxamine, paroxetine, sertraline and vilazodone [50]. 6 randomized clinical trials were done including 595 participants which met the quality criterion for inclusion in the studies. The psycho-social community-based involvement, psycho-dynamic therapy, cognitive-behavioral intervention, CBT, antidepressant, second-generation tricyclic, and placebo were used in place of determinants variations. There was an increased responsibility as well as reduced rates amongst participants treated through SSRIs with higher mean deviations on the scale of depression, not neglecting that findings are not always statistically substantial. The failure rate was greater among the three trials with similar treatment and relative groups. Overall SSRI was apparently greatly tolerated, and experimental quality assessment was good [36].

What is the latest pressing need to prevent depression from aggravating to suicidality?

In the link between hopelessness and suicidality, severe depression has a vital mediator role in these association, and this apparatus is dependently proceeding the levels of impulsivity. MDD individuals by means of greater impulsivity seem to have greater suicidal ideations than when less depressed [18]. The results point out the position of impulsivity assessment and alleviation of depression features on the way to avoid suicide among individual through MDD. An initiative is directly related to depression and hopelessness, while indirectly related to suicidality. The reduced initiative established an important role for valuation and intervention in the management of depression. Cognitive, behavioral, and interpersonal interventions may help augments an individual's initiative ability and reduced features of depression and hopelessness [6].

To investigate the development, assessor, arbiters of depression and suicidality with all 12 weeks home problematic adoption therapy (PATH) as opposed towards an (ST-CI) Supportive Therapy for Cognitively Impaired Older 39 adults' patients by means of MD with dementia. PATH individuals had a significantly higher depression deterioration than an ST-CI individual with concluded 12 weeks of management. PATH individuals by means of increase societal aid required the utmost decrease in downheartedness. Both treatments required an equivalent decrease in suicidality [12]. Empirical evidence relating CBT, Motivational enhancement therapy, and family-focused therapy to depression and SUD feature decrease in adolescents, limited studies have provided data on mechanisms that may predispose to this effect. The potential mechanism comprises improvements in dysfunctional reward dispensation and self-efficacy [44]. This finding establishes the exact efficiency of (IPT) Interpersonal Psychotherapy and suppositories in reducing suicidality, provides a supplementary general effect on depression. This supplements the evidence that depression treatments, precisely IPT, and drug, can as well decrease suicidality and further improve our knowledge of the relationship amongst depression and suicide [48].

Conclusion

The link between the neuropsychiatric brain and occipital lobe is inter-related with depression which somewhat progresses to suicidality; therefore pharmaco-psychotherapy display a significant role in the efficacy of MDD management. Hence more studies design, as well as diagnostic strategies, are required to be able to envisage the most potentiate management in twisted occipital lobe and MDD to prevent suicidality.

Ethical consideration with dissemination:

No ethical endorsement is obligatory since this study comprises neither confidential personal patient data nor interferences with patients.

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