

End the emotional
pain and intense
stress by
understanding and
treating major dep...

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Abstract

This paper looks to come to a better understanding of Major Depressive Disorder so that societies around the world can find ways of combating the increasing occurrence of suicide, one of the highest causes of death worldwide. Major Depressive Disorder is a mood disorder associated with deep feelings of sadness and despair, loss of motivation and goal-oriented thinking, and suicide in many cases. Intense stress and emotional pain caused by Major Depressive Disorder is a major contributor to the millions who die by suicide each year. To better understand why depressed patients feel the way they do, numerous malformations in the brain can be noted, especially in areas responsible for emotional regulation. Common methods to treat the symptoms of depression are the use of psychotropic drugs and therapy. A combination of these two over the course of time has proven effective in most cases but many people slip through the cracks of treatment and fail to recover.

Effects of Depression on The Human Brain and Potential Treatments For Major Depressive Disorder

Major Depressive Disorder (MDD) is one of the most common mental disorders with a lifetime incidence of 17. 1% (Wei). What makes MDD so threatening to society is its high correlation with suicide. 15% of all patients with MDD commit suicide contributing to the annual global death toll in the millions each year (Wei) In order to end MDD's threat of suicide, it is necessary to come to an understanding of what the disorder does to the brain, so we can combat its symptoms. Evidence indicates that MDD is a "Neurodegenerative disorder", attacking and destroying brain cells and

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blocking off connections between neurons and the effects of this damage can manifest as depression (MARANO). Along with evidence of brain damage, there appear to be many malformations in the brain of the depressed, specifically in areas of the brain associated with emotion regulation and stress (MARANO). Research has shown that through use of drugs, neurochemistry can be manually altered to counter the symptoms of major depressive disorder. In addition to pharmaceutical methods of treatment, therapy is commonly prescribed alongside and the combination of the two has shown to be effective in either improving the conditions or outright curing most patients with depression. “ The majority of systematic reviews and meta-analyses have concluded that cognitive behavior therapy is an effective treatment for depression” (Thimm).

Depression

With a lifetime incidence of 17. 1%, Major Depressive Disorder is one of the most common mental illnesses worldwide (Wei). Symptoms of Major Depressive Disorder include: lack of energy, disturbed sleep, loss of appetite, numbness of pleasure, difficulty concentrating, impaired short-term memory, feelings of hopelessness, and in some cases suicide attempts (MARANO). What separates Major Depressive Disorder from everyday sadness is the intensity and longevity of the symptoms with the DSM-IV stating that the symptoms must persist “ nearly every day for two weeks” in order to qualify as Major Depressive Disorder (Wong). Patients with Major Depressive Disorder have increased risk of premature death to heart and cardiovascular disease (Wong). Looking past the threat of heart disease shows an even more shocking statistic, around 15% of patients with Major Depressive

Disorder die by suicide (Wei). A study of suicide attempts revealing that they are almost exclusively performed during major depressive episodes (Wei). Suicide is the eighth leading cause of death in the U. S. and the third leading cause of death among teenagers and young adults aged 15-24 (Wong). Apart from the emotional damage caused to the friends, family, and people associated with suicide victims, suicide costs the U. S. economy 43 billion dollars every year (Wong). To better understand the conditions surrounding suicide, Shengnan Wei, Haiyan Li, Jinglin Hou, Wei Chen, Xu Chen, and Xiaxia Quin, researchers published in *Annals of General Psychiatry*, tested 127 patients hospitalized after suicide attempts for age, gender, race, and 12 other factors about their demographics and nature of their suicide attempts such as religion and presence of a suicide note (Wei). Results showed that 86. 61% of test subjects were female (Wei), however; due to the cultural view and gender role of females in China, the country that the research was conducted in, this statistic is likely to differ from the statistics of other countries. Looking beyond the sex statistic and onto the rest, there were clear differences in the test subjects between the 42. 5% diagnosed with Major Depressive Disorder and the rest with no indications of depressive disorders (Wei). The subjects with no psychiatric diagnosis had higher rates of self-rescue and had more impulsive, under-planned suicides while the subjects diagnosed with Major Depressive Disorder were more likely to have written a suicide note and had ideas of suicide long before attempting (Wei). As for motives, subjects without psychiatric diagnosis were more likely to commit suicide as a means for revenge on others while the subjects with Major Depressive Disorder mostly attempted suicide in an attempt to put an

end to emotional pains and burden (Wei). From these results it can be seen that what separated those with major depressive disorder from those without was intense emotional pain and a lack of motivation to live. Finding the source of these symptoms could be the key to ending the threat of suicide caused by Major Depressive Disorder.

The Brain on Depression

Much like how Major Depressive Disorder drastically changes the personality and lifestyle of a patient, there are physical changes in the person's brain as well. The prefrontal cortex is the portion of the brain located at the front of the brain behind the forehead and is responsible for goal-oriented behavior, planning ability, understanding relationships and patterns, emotional management, problem solving, short term memory, and language (Siddiqui). Seeing how many of these functions are noticeably inhibited during depressive episodes, changes to the prefrontal cortex would be expected as a result of Major Depressive Disorder.

According to Richard Davidson, Ph. D, a professor of psychology and psychiatry at the University of Wisconsin, the prefrontal cortex is split into two halves when it comes to management of emotions (MARANO). The left side is associated with the processing of positive feelings while the left side is associated with negative feelings (MARANO). When observing the brains of depressed patients, Davidson found that there is decreased blood flow and metabolism in the left sides of their prefrontal cortex (MARANO). While also processing their respective emotions, each side also works to inhibit the other, the left stopping the right from processing too much positivity and vice versa with the right side. The lack of blood flow and metabolism can <https://assignbuster.com/end-the-emotional-pain-and-intense-stress-by-understanding-and-treating-major-depressive-disorder/>

explain the numbness of pleasure, loss of motivation, and sense of hopelessness that is often seen in depressed patients. Low functionality of their right prefrontal cortex allows for their negative emotions to run rampant while any positivity or pleasure they feel is dulled without the ability to process it.

Wayne Drevets, M. D., director and president of the Laureate Institute for Brain Research, found that a portion of the prefrontal cortex of depressed patients is actually smaller than those of healthy people (MARANO). The specific part of the prefrontal cortex that was seen to be smaller is called the Ventral Anterior Cingulate (VAC) (MARANO). The VAC plays a hormonal role in the body's response to stress and has connections to the hypothalamus, the brain structure responsible for initiating the body's stress response (MARANO). To find out the cause of the shrinkage, researchers at Washington University investigated the deceased brains of people with depressive or bipolar disorders and found that while the number of neurons were ordinary, there was a decreased number of "Glia Cells" (MARANO). While not as important as neurons, glia cells exist to maintain the neurons by supplying glucose as a fuel and Glutamate, the main neurotransmitter used to activate neurons (MARANO). The researchers found that the patients with fewer glia cells in the VAC typically came from families with a history of depressive disorders (MARANO). This natural lack of maintenance cells helps explain the malfunctions seen in the prefrontal cortex.

By showing pictures with a strong emotional influence to subjects in a functional magnetic resonance imager, Davidson noted that the amygdala, a

small part of the brain located near the center, is responsible for flagging when strong negative emotions are necessary such as when your life is threatened (MARANO). The amygdala is seen to be active during times of helplessness and despair, feelings commonly associated with Major Depressive episodes (MARANO). Davidson found that blood flow to the amygdala had a strong positive correlation with the severity of one's depression (MARANO). When the depressed active amygdala is paired with a left prefrontal cortex of a person with Major Depressive Disorder, the amygdala is able to spiral out of control without an active left prefrontal cortex to limit generation of negative emotions (MARANO). This negative synergy between parts of the brain could be what drives the seemingly irrational despair and hopelessness commonly seen in depressed people.

One of the amazing abilities of the brain is its ability to adapt and learn. This ability comes from the growth of new dendrites on neurons (MARANO). Dendrites are the portions of the neuron which connect to others in order to open up new neural pathways (MARANO). The constant sprouting of new connections among hundreds of thousands of neurons is what lets humans mentally adapt to nearly any situation. Ronald Duman, associate professor of psychiatry and pharmacology at Yale, found that depressed patients have a deficiency in " Brain-Derived Neurotrophic Factor" (BDNF), a substance that plays a key role in forming connections between neurons (MARANO). The lack of BDNF impairs a depressed person's ability to seek alternatives and contributes to feelings of helplessness and subsequent lack of motivation.

Treatment

Due to the deficit of BDNF found in depressed patients, treatment is difficult and requires continuous effort over a long period of time. One approach to treating depression is a pharmaceutical approach with the use of drugs to combat the effects of depression. A common type of drug used in treating depression is called a “ Selective Serotonin Reuptake Inhibitor” (SSRI) (Khan). SSRIs work by blocking off receptor sites on the neuron for serotonin, a neurotransmitter responsible for mood regulation. (Ross-Flanigan). By blocking off receptor sites, serotonin is able to build up in the synapse between neurons before being allowed to pass on (Ross-Flanigan). By allowing a buildup of serotonin to form, SSRIs work to counter the low serotonin levels commonly associated with panic or depressive disorders (Ross-Flanigan). According to Aman U. Khan, “ the effects of drugs on the brain can be conceptualized better by dividing them into primary, secondary, and tertiary effects”. The primary effect of a drug is the initial effect occurring at the sites of synthesis, release, inhibition, or metabolism of a neurotransmitter (Khan). The primary effect of Sertraline (an SSRI) is the blocking of receptor sites and subsequent buildup of serotonin in the synapse (Khan). The secondary effect of psychotropic drugs take place from the end result of the primary effect (Khan). In the case of Sertraline, “ by blocking serotonin transporter, initiates a series of very complicated interactions among neurotransmitters, neuropeptides and hormones that may involve the whole CNS” (Khan). Tertiary effects of psychotropic drugs are the changes caused by the drug past the initial purpose (Khan).

Sertraline’s tertiary effects come from the results of the surge of serotonin on other neurotransmitters and the neuron itself (Khan). Its hard to track all <https://assignbuster.com/end-the-emotional-pain-and-intense-stress-by-understanding-and-treating-major-depressive-disorder/>

of the the expansive list of all tertiary effects a drug has, each other neurotransmitter that is disturbed as a result of the drug's primary and secondary reaction has its own primary and secondary actions which all contribute to the overall tertiary action of the drug (Khan). While pharmaceuticals can play an important role in the treatment and recovery of a patient with Major Depressive Disorder, they are not the final word on treatment and have downsides. The most apparent downsides from the use of drugs to combat depression is side effects. Drugs change the body in a way that combats a symptom but what positively changes the brain can mean trouble for the rest of the body. While antidepressant drugs can help the brain recover from the effects of depression, they can also bring about gastrointestinal problems, headaches, or dizziness (Kreuch). Because of the widespread effects of depression on the brain and body, simply affecting one neurotransmitter is not enough to combat the widespread nature of depression so it must also be paired together with other drugs, therapy, or both.

Therapy is a less invasive and more indirect approach to treating depression which focuses on restoring the mindset of a depressed person (Wong).

Therapy helps patients build up the self-esteem, goal-oriented thinking, and personal relationships that often suffers from years of depression (Wong).

Typically paired with medication, therapy lets the patient play an active role in their own recovery, which also gives the depressed person a sense of control that is usually lost to Major Depressive Disorder (Wong). Because of these benefits, it is fitting that many different types of therapy such as

psychotherapy, cognitive-behavioral therapy, interpersonal therapy, and many more have been proven effective treatments to depression (Wong).

Research done by Jens C. Thimm and Liss Antonsen published in BMC Psychiatry explores the effectiveness of cognitive behavioral group therapy, a method involving teaching a group of depressed patients about concepts and skills such as depression, interpersonal relationships, resources for recovery, the cognitive model of depression, and relapse prevention (Thimm). Administering therapy in a group setting has the added benefit of allowing patients to build relationships among others with similar conditions and treating feelings of isolation (Thimm). Group therapy is not for everyone though, as some patients with extreme anxiety disorders experience extreme discomfort when part of a group and because one trained therapist is responsible for multiple people, it is difficult to give each patient the specialized care they need (Thimm). Thimm and Antonsen measured the effectiveness of the therapy using the BDI-II test, a 21-item, self-report inventories designed to assess depression severity (Thimm). One hundred forty-three Participants took the BDI-II at four different points of the cognitive behavioral group therapy cycle, pre-treatment, mid-treatment, post-treatment, and follow up sessions (Thimm). By the end of the follow up sessions, the four test results of eighty-eight patients were studied to determine the effectiveness of the group therapy (Thimm). The results showed that by the post treatment test, 44% of the patients showed improvement in their condition with 30% having fully recovered (Thimm). The results only got better with test results from follow up sessions which showed 57% of patients with significant improvement and 40% being fully

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recovered (Thimm). While the results appear great, they fail to report the conditions of the 17.5% of total patients who dropped out of the therapy sessions (Thimm). For a variety of reasons such as illness, family issues, and pregnancy problems, 25 of the 143 patients had to stop coming to the therapy sessions (Thimm). The near 20% dropout rate highlights one of the difficulties of depression treatment, it takes place slowly over a long period of time and requires effort and motivation to recover that is already being sapped away by major depressive disorder.

Conclusion

In an effort to come to a better understanding of Major Depressive Disorder, this research paper explored the effects and symptoms of the disorder along with the conditions surrounding suicide, a leading cause of death worldwide commonly associated with Major Depressive Disorder. Numerous physical abnormalities were discovered in the prefrontal cortex of people with Major Depressive Disorder. Depressed patients were found to have less activity in the left prefrontal cortex, the side associated with processing positive emotions and regulating negative ones. Other noticeable differences was a lack of maintenance cells in key emotional and stress control centers, increased blood flow and activity in the amygdala, a portion of the brain associated with stress responses, and a deficiency in neurochemicals required for neural plasticity and growth. These numerous differences in the brain help explain the abnormal sadness and despair seen in patients with major depressive disorder and helps in understanding how to treat it. Major Depressive Disorder can be treated and, in many cases, cured through a long process of combining psychotropic drugs such as SSRIs used to boost

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levels of emotional regulation neurochemicals and therapy to get patients back on track with productive, goal-oriented thinking and relationship building skills. While therapy combined with antidepressant drugs has been proven to be effective, suicide is still a leading cause of death worldwide and many depressed patients find that the commonly accepted treatments are ineffective for them. In a world now filled with rapid technological advances and urbanization, many more people are faced with stressors and social pressures never seen before in history. The problem of depression and suicide will only grow until societies across the globe seek to gain a better understanding of it.