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Designing the Kit for Identifying Depression using Artificial Intelligence

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Abstract: ***The proposed kit or device will check the components or the elements in a human brain or any other creatures (animals) and identify whether the person is having depression or any other mental related problems like schizophrenia. There is no need of doctor in future if this kit is designed. Generally human brain contains lot of chemical element. When these chemical level increases or decreases there is a chance for diseases in the brain such as depression etc. These has to be checked periodically and if there is any changes occur then this kit will advice the person to take the specific food or medicine. The people need not to go to hospital and consult a doctor. By regularly checking with this device it will alert them to take proper food. A man can live happily without caring about the diseases. The computer concepts such as Artificial intelligence and data mining techniques to be adopted to know the patients symptoms and can make decision according to them to provide medicines. Any kind of disease can be found by using this device and regulates the body function normally.***

Keywords: Depression, elements, diseases

1. Introduction

All human body is made up of elements and should be available at correct proportion to be healthy without any diseases. Their percentage in the body varies from one person to another person. If the percentage is increases or decreases then there is a chance of many diseases in the body. This proposed device will find a measurement of each element in the body and it display the symptoms, diseases, prescriptions and also advice to take the necessary food. This is the boon to the people in future and this device can be carried out by a person easily and can check it by the people itself. In future there is no need of doctor if this device is successful This paper need the information of trace element information in the brain to devise a kit.A artificial intelligence must be given to the kit to identify the elements,their percentage in the body,c compare the symptoms to identify. Diseases with the stored database and should give proper advice to the patients.

1.1 Introduction to human brain and chemicals

Neurons (NUR-ons) in the human brain use to communicate with each other. They now know that all the feelings and emotions that people experience are produced through chemical changes in the brain. The result is chemical dependency or addiction. What happens when brain chemicals are modified is described in the three examples of neurotransmitters (serotonin, dopamine, and gamma-aminobutyric acid) below.

Serotonin
Many studies have linked low levels of the neurotransmitter serotonin to depression, impulsive and aggressive forms of behavior, violence, and even suicide. The class of medications called SSRIs, like the one that was given to Hector, prevents the neurons that release this chemical from taking it back in once it is in the synapse. As a result, the person has more serotonin available to attach to receptors in the brain, which can ease the symptoms of depression

Depression, social anxiety, excessive shyness, and hyperactivity are just some of the conditions that might be treated successfully with medications that alter neurotransmitter levels in the brain. Before these medications became available, people with these and other problems either had to live with them or worked with a psychiatrist or psychologist to deal with their feelings. Now we know that brain chemistry disorders can be treated, allowing more people to overcome much of their social difficulty.

Dopamine
Neurons in the core of the brain release dopamine (DO-pa-meen), a neurotransmitter that affects processes that control movement, emotional response, and the ability to experience pleasure and pain. In people who have Parkinson disease, dopamine-transmitting neurons in this area of the brain die, which causes progressive loss of movement control. A medication called L-DOPA, which the brain can convert into dopamine, often helps control these symptoms. Some researchers have theorized that people with the mental disorder known as schizophrenia* are, in fact, overly sensitive to the dopamine in their brains. Some of these people seem to have been helped by medications that block dopamine receptors in the brain, thereby limiting the neurotransmitter's effect.

Gamma-aminobutyric acid
Gamma-aminobutyric acid, or GABA, is the main neurotransmitter that works to inhibit the brain's neurons from acting. Research suggests that certain types of epilepsy, which is characterized by recurring seizures that affect a person's awareness and movements, may be the result of having too little GABA in the brain. The neuronal messaging system goes into overdrive, with tens of thousands of neurons sending messages intensely and simultaneously, which produces a seizure. Researchers believe that enzymes may be responsible for breaking down too much GABA, and they have developed medications that appear to help combat this process.

1.2 Depression-More Than Ordinary Sadness

Everyone feels sad occasionally, especially after a loss or a setback. Feeling down for short periods is perfectly normal. However, when sadness lasts several weeks and starts to interfere with normal activities, such as studying, relationships with friends and family, attendance at school, or activities that are normally fun, then it is more than an ordinary variation in mood. It is depression.

Depression is sometimes called an invisible disease, because it does not produce a rash or a fever or any other easily recognizable sign of a problem. In addition, many people are afraid or embarrassed to talk about how unhappy or hopeless they feel, mistakenly believing the feelings are a sign of weakness or a character flaw on their part. Sometimes those close to a person experiencing depression add to this mistaken belief by encouraging the person to simply "cheer up." Because it often goes unrecognized, depression often goes untreated, but it is just as important to treat depression as it is to treat illnesses like diabetes or asthma. Depression should be treated by a mental health professional. The good news is that 80 to 90 percent of people with depression can be helped by treatment, often within a few weeks. Left untreated, however, depression can get worse and last longer. This needlessly reduces a person's full participation in life. In severe cases, it can lead to suicide. To avoid this the chemicals in the human brain must be identified and their percentage in the brain can be calculated and according to that all these information must be stored and artificial intelligence must be given to identify whether the person is affected by any brain diseases.

1.3 Symptoms of Depression

Depression differs from ordinary sadness or grief. With depression there is:

- A persistent feeling of sadness or emptiness that occurs daily and lasts longer than 2 weeks
- Unhappiness or a feeling of worthlessness or guilt that interferes with normal activities
- Loss of pleasure in activities that once were enjoyable, such as taking part in hobbies, listening to music, or going out with friends.

Not everyone experiences depression in the same way, but in addition to the symptoms listed above, other common changes that can occur include:

- Eating too much or too little
- Sleeping too much or too little; difficulty getting up or going to sleep
- Unexplained periods or restlessness, irritability, or crying
- Fatigue and decreased energy, even when getting enough sleep
- Difficulty concentrating or remembering things
- Difficulty making decisions
- Increased interest in death
- Thoughts of suicide

Preteens and teenagers experience many of these symptoms, but there are additional symptoms of depression that are common in young people. These include:

- Ongoing physical problems, such as headaches, digestive problems, or persistent aches and pains that have no obvious physical explanation and do not respond to medical treatment
- Increased absences from school or worsening school performance
- Talking about or acting on the desire to run away from home
- Unexplained outbursts of shouting, complaining, or crying
- Increased irritability, anger, or hostility
- Extreme sensitivity to failure or rejection
- Being bored
- Lack of interest in friends and a desire to isolate oneself
- Increased difficulties in relationships with family, friends, or teachers
- Alcohol or substance abuse
- Reckless behaviour
- Abnormal fear of death

Because depression can involve physical symptoms, people with depression often consult their physician. This is very helpful since symptoms of depression can be symptoms of medical conditions as well. A medical check-up can determine if there is some medical reason for their symptoms, such as another disease or a side effect of medication. If these reasons are ruled out, a likely cause is depression. The physician may ask about feelings of sadness, hopelessness, or discouragement, loss of pleasure, and sleeping and eating problems to confirm a diagnosis of depression. The physicians then can discuss treatment options with the person, which may include a referral to a mental health professional for psychotherapy and, in some cases, medication. Using the artificial intelligence given it will check the mood of a person by some questions already stored in a database.

1.4 The Causes of depression

Experts are not exactly sure what causes depression. Depression is complex, but it appears to have mental, physical, genetic, and environmental components. These parts come together in different ways, making it difficult to pinpoint the exact cause of depression or predict who will become depressed and under what circumstances. One thing that is certain is that depression is not a weakness or a character flaw. It is not laziness or intentional bad behavior. People with depression cannot simply pull themselves together and drive out their sad and empty feelings, no matter how much the people around them encourage them to "snap out of it."

1.5 Mental components

Depression affects a person's thoughts, but it also seems that a person's thoughts can affect depression. Why this happens is not clear. Some experts believe that depression comes from anger that is not expressed, but is directed inward at oneself instead. Others believe that negative thoughts feed depression, and that people who think negative things about themselves, the world around them, and the future encourage and deepen the depression. Feelings of being helpless and of having no choices, even if in reality choices exist, also can

be mental components of depression. People who have low self-esteem and perfectionists who set unrealistic goals for themselves also are prone to depression.

1.6 Physical Components

Researchers have found a link between depression and an imbalance of certain chemicals in the brain, called neurotransmitters

- Brain imaging techniques show that areas of the brain responsible for moods, thinking, sleep, appetite, and behavior function differently in some people with depression. In addition to differences in brain chemistry, some medical illnesses, such as stroke * , heart attack, cancer, or diseases that cause long-lasting pain, can sometimes trigger depression. In women, hormonal changes that occur just after the birth of a child cause some new mothers to experience postpartum (post-PAHR-tum) depression, also called the "baby blues." For most women, this is a mild, short-lived problem that goes away on its own after a week or so. In a few cases, though, the problem is more severe and long-lasting, and treatment is required.

1.7 Genetic components

- It appears that genetic (inherited) factors also cause vulnerability to some kinds of depression. This is demonstrated by the way that depression tends to run in families, and by twin research. Studies of twins have found that identical twins (twins who have the same genes *) are twice
- as likely to both experience major depression as are fraternal twins (twins who do not share all the same genes). Although a person with a parent, brother, or sister who has a depressive illness is more likely to become depressed than someone with no such family history, many people who have relatives with depression are not themselves depressed. For other people, depression seems to "come out of nowhere," with no family history of the condition. This indicates that while genetic factors certainly contribute to depression, other factors play a significant role in whether the depression actually develops.
- neurotransmitter (NUR-o-transmit-er) is a chemical produced in and released by a nerve cell that helps transmit a nerve im-pulse or message to another cell.
- stroke is a disorder in which an area of the brain is damaged due to sudden interruption of its blood supply. This is often caused by a blood clot blocking a blood vessel supplying the brain.
- gene is a chemical found in the chromosomes in the body's cells that passes on information, such as eye color, height, or other characteristics, from parent to child.

1.8 Environmental components

The death of a loved one, a failure at school or on the job, the end of a romantic relationship, or many other kinds of losses can trigger an episode of depression in some people. Depression is different from the normal mourning process that follows a loss. A person in mourning goes through distinct stages of psychological reaction to the loss, ending with the ability to accept the loss and resume normal functioning. With depression, the sadness continues over a long time with no progress being made toward acceptance of the change. There is no way to predict which environmental stresses will trigger depression in specific individuals.

1.9 Types of Depressive Illnesses

Depression can take a variety of forms. It may be mild, moderate, or severe. It may be mixed with periods of normal feelings or periods of abnormally heightened energy called manic (MAN-ik) periods, or depression may be continuous but low level. Some depressions occur seasonally. Although feelings of sadness, unworthiness, discouragement, and loss of interest in normally pleasant activities are common to all forms of depression, different depressive illnesses have different patterns of symptoms and are treated somewhat differently.

1.9.1 Major depression

Major depression is a combination of the symptoms listed above that is serious and long-lasting enough to interfere with daily life. It is also called unipolar depression. Major depression is the leading cause of disability in the United States and worldwide, because it can become severe enough to leave people unable to work, concentrate, learn, or care for themselves or their family. If left untreated, major depression can last for months or longer. Some people have only one period of major depression in their lives. For many others, however, episodes of major depression come and go for years.

1.9.2 Dysthymia

Dysthymia (dis-THI-mee-a) is the name given to a long-lasting depressed mood that is less severe than major depression, but which continues at a low level for a long time. People with dysthymia feel sad and show at least two other symptoms of depression for at least 2 years. Dysthymia often goes undiagnosed, because it is not disabling. However, it does leave people feeling sad and empty and keeps them from enjoying life and functioning at their best. Many people who have dysthymia also have episodes of major depression during their lives.

1.9.3 Bipolar disorder

Bipolar (by-POLE-are) disorder used to be called manic-depressive illness. It has two faces. One face is major depression. The other is mania (MAY-nee-a), an unnaturally high mood in which a person may be overactive, overtalkative, or filled with tremendous energy. The severe lows of depression alternate with the extreme highs of the manic phase. Symptoms of mania include:

- Great energy; ability to go with little sleep for days without feeling tired
- Severe mood changes from extreme happiness or silliness to irritability or anger
- Overinflated self-confidence; unrealistic belief in one's own abilities
- Increased activity, restlessness, or distractibility; inability to stick to tasks
- Racing, muddled thoughts that cannot be turned off
- Impaired judgment of risk and increased reckless behavior.

For most people, the mood swings between depression and mania occur over a long period of time, sometimes years. If bipolar disorder is left untreated, though, the intervals between mood shifts tend to become shorter and shorter. In children, the cycle is usually quite short, sometimes occurring several times in a day.

Bipolar disorder is not as common as major depression. About 1 out of every 100 people has bipolar disorder, and unlike major depression, it occurs equally often in men and women. However, bipolar disorder appears to be more likely to run in families than major depression.

It is not uncommon for people of all ages to respond to certain life stressors with emotional and behavioral symptoms. For example, someone may become depressed after losing a job or when a loved one has died. Another person may feel worried, anxious, or vulnerable after an injury or illness. A child or teen may have trouble concentrating in school or show some disruptive behavior in the months following his or her parents' divorce.

When symptoms are too mild to be diagnosed as another mental health condition and occur as a reaction to a specific known life situation, the condition is called an adjustment disorder. Because people may react to difficult life circumstances with a variety of different types of emotions and behaviors, there are many types of adjustment disorders.

When the main symptoms of an adjustment disorder are depressed mood and related changes in feelings and behavior, such as feeling hopeless and crying a lot, the condition is called adjustment disorder with depressed mood.

With adjustment disorder, the symptoms are temporary and disappear within 6 months after the source of stress has been removed.

1.9.4 Seasonal affective disorder (SAD)

SAD is a form of depression that comes and goes at the same time each year, usually starting with the onset of winter. People with seasonal affective disorder often experience fatigue and oversleeping, carbohydrate craving and weight gain, as well as an overly sad mood. More women have SAD than men, and children and teens can also experience SAD. SAD is linked to decreasing exposure to daylight that occurs naturally during the winter months. Studies have shown that when people with this form of depression travel south in winter, their symptoms improve, and when they travel north their symptoms worsen.
These findings have led to treatment with artificial light. With light therapy, people use bright "grow-light" type lights or special lightboxes for several hours each day. This therapy has shown good results, and research continues to investigate this form of depression.

Depression depends on its type and severity. There are several approaches that can be used either alone or in combination. Current thinking suggests that medication combined with psychotherapy (sykoe-THER-a-pea) is the most effective treatment for moderate to severe depression. The medication helps relieve the symptoms of depression, while the psychotherapy helps people change their negative thought patterns.

1.10 Medication

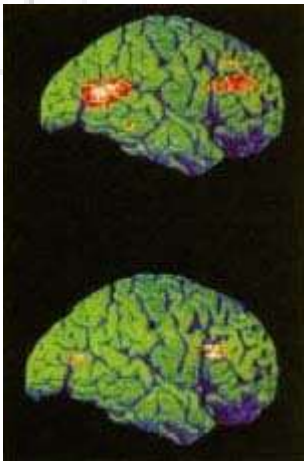
Antidepressant (an-tie-dee-PRESS-ant) medication can be prescribed by a psychiatrist (a medical doctor who specializes in mental disorders) or another physician. People usually must take a medication for several weeks before they notice changes in their mood, and they typically continue to take the drug for 6 to 9 months. Antidepressants are not habit-forming. Not every medication works for every person, however. One group of antidepressants, introduced in the 1980s, is called selective serotonin (ser-o-TOE-nin) reuptake inhibitors (SSRIs). Serotonin is a neurotransmitter in the brain, and these drugs work by altering brain chemistry. They generally have fewer side effects than other drugs used to treat depression. Examples of SSRIs include fluoxetine (brand name Prozac), paroxetine (Paxil), and sertraline (Zoloft). Other types of antidepressants, including groups of drugs called monoamine oxidase inhibitors (MAOIs) and tricyclic antidepressants (TCAs), also can be helpful for some people.

Lithium (Eskalith, Lithobid) is a medication that can be very effective in treating bipolar disorder. However, lithium does not work for everyone. For these people, doctors sometimes prescribe another mood-stabilizing medication, such as carbamazepine (Tegretol) or divalproex sodium (Depakote). The proposed kit will analyse which medication to be given to the patients.

1.11 Treatment for depression

Psychotherapy

Psychotherapy, or "talking therapy," involves a therapeutic relationship between the depressed person and a psychiatrist, psychologist, or mental health counselor. Cognitive-behavioral (KOG-ni-tiv-be-HAVE-yor-ul) therapy (CBT) and interpersonal (in-ter-PER-son-al)



Positron emission tomography (PET) records electrical activity inside the brain. With red and yellow showing brain activity, the brain of a depressed person at the top shows a decrease in activity compared to the brain of a person who has been treated for depression at the bottom. Treatment can improve metabolic acticity and blood flow in the brain.

Photo Researchers, Inc.

therapy (IPT) have been shown to be particularly useful. CBT focuses on helping people change their thoughts and actions. IPT helps people focus on resolving problems in relationships that may be triggers for depression.

Electroconvulsive (e-LEK-troe-kon-VUL-siv) therapy (ECT)

ECT, popularly known as "shock therapy," is used to treat severe depression when immediate relief is needed. This treatment, which is performed by a physician, requires hospitalization and anesthesia to keep the person free of pain and injury. Carefully controlled electrical pulses are sent to the brain, causing a brief seizure. Although this treatment is controversial, it can be a lifesaver for someone who is suicidal and needs immediate relie

2. Conclusion

The proposed kit will help the patients to identify the disease at a right time and at regular interval.this device will automatically advice the patients to take the proper medication when the chemical level increases or decreases in the brain.

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