

Case Study Regarding Natural Products and Heart Health

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Case Study Regarding Natural Products

Introduction

Today, the world has experienced an upsurge in the usage of natural products to treat specific diseases. The world has thus experienced a breakthrough in the treatment of particular infections that have brought devastating effects. Today, stroke is the leading cause of death and disability, and presently, there has been an increasing interest in using natural medicine as a treatment option. Therefore, natural products have proved to be potential treatment options for stroke patients. However, there has been a challenge in their usage, which can be attributed to the failure in clinical translation. The paper presents a case study that critically examines the use of natural products in treating stroke.

Background

Natural medicine has excellent prospects for ischaemic stroke treatment, even though several concerns should be addressed. However, the success of certain natural products needs to be researched through animal research before translating to humans. According to Mir (2015), the natural products mediating the neuroprotective effects on stroke need more consideration for investigating the precise mechanisms. Worldwide, stroke has been identified as the leading cause of disability and cause of death. For Ischaemic stroke therapy, the only food and drug administration-approved therapy is recombinant tissue plasminogen activator. Carl & Chunfa (2016) highlights that only 10% of stroke patients are eligible for tPA treatment. Recently, there has been an increasing interest in natural medicines due to ineffective therapeutic strategies for stroke treatment. Therefore, this has triggered many nations worldwide to engage in intensive and extensive research on natural medications. The natural products help the body restore and maintain internal balance by providing external stimulation.

Recently, there has been an analysis of the general effects of specific natural medications on stroke (Almaliti 2013). The studies have established that the natural products have more positive impacts, such as improving the microcirculation in the brain and offering protection against Ischemic or reperfusion injury. The natural products reduce oxidative stress and neuroinflammation and also modulate microglia polarization.

Ischaemic stroke promotes oxidative stress by producing excessive reactive oxygen species (ROS). Oxidative stress is associated with a wide range of damage by oxidizing the lipid acids, proteins, and DNA, leading to the death of cells (Monahan 2019). The downstream impact on the macromolecules is diminished explicitly by the natural products by targeting the pathways upstream from ROS production. In cerebral ischemia, oxidative stress is considered a primary factor of brain injury. After a stroke, Norrving (2014) explains that the oxidative effects are caused by the excessive ROS, leading to the stimulation of the peroxidation of lipids, proteins, and nucleic acids. Therefore, the DNA is damaged, and extreme effects lead to mitochondrial dysfunction.

Stroke

A stroke occurs when blood flow to the brain is blocked or severely reduced. Because the brain depends on a continuous supply of oxygen and nutrients to function properly, even a brief interruption can cause significant damage. Without timely restoration of circulation, these disruptions can quickly become life-threatening, making stroke a true medical emergency (Alhazzani, 2017). After just a few minutes without blood or oxygen, the brain cells begin to die. The brain function is lost immediately, the brain cells die, and one cannot do certain things conducted by the part of the brain that has been damaged (Lapchak et al. 2018). One's ability to move may be affected by stroke and speaking ability. Similarly, one's ability to control emotions, think and remember can also be affected.

The leading cause of stroke is the failure or disruption of blood flow in the brain. Anyone at any age is at risk of stroke. However, certain risk factors increase the chances of stroke. Whereas some risk factors for stroke can be managed, certain risk factors cannot be managed. One of the risk factors that can be controlled is high blood pressure. Blood vessels that supply blood to the brain can be damaged by a blood pressure of 140/90 (Grotta 2016). The second most important risk factor for stroke is heart disease. The primary cause of death among the survivors of stroke is heart disease. However, heart diseases can be managed by taking prescribed drugs. Similarly, people with diabetes are at a considerably higher risk of suffering stroke than those without diabetes.

Smoking doubles the risk of ischemic stroke, placing frequent smokers in a particularly high-risk category for this potentially devastating condition. Similarly, the use of birth control pills has been linked to an elevated risk of stroke, which is why medical consultation is strongly recommended before beginning such medication. A history of transient ischemic attacks (TIAs)—often referred to as “mini-strokes” due to their similar symptoms—also significantly increases stroke susceptibility (Alexandrov, 2011). In addition, individuals with elevated red blood cell counts face a greater stroke risk, as the thickened blood hinders circulation and raises the likelihood of clot formation.

In contrast, certain risk factors for stroke are non-modifiable. Age is a primary example, as the likelihood of experiencing a stroke increases significantly after the age of 55. No preventive measures can alter this factor. Similarly, race has been identified as a non-modifiable risk factor. Research indicates that African Americans face a substantially higher risk of stroke and related disability compared to white populations (Rahman et al., 2020).

Additionally, men are at a higher risk of suffering from stroke compared to women. Further, people with a family history of stroke are at a higher risk of suffering from a stroke.

Other risk factors include social and economic factors. Social status likely increases the possibility of suffering from a stroke. The low-income and the poor are likely to suffer a stroke compared to the rich—similarly, deaths related to death increase (Mir 2015). Therefore, the temperatures, season, and climate highly increase the chances of suffering from a stroke. Lastly, the place where someone lives is also a risk factor. Previous research has established that the people living in the southeastern part of the United States of America suffer more from a stroke.

Symptoms of a stroke

One of the stroke symptoms is weakness or numbness in the face, arm, and legs, and the numbness is usually felt on one side of the body. In the case stroke study, the first patient experienced numbness in the hand and legs, which hindered his movement. Thus, the patient was forced to use a walking frame to aid his movement. Similarly, another symptom of a stroke is difficulty in speaking or understanding. Since stroke interferes with the brain, which is responsible for processing information, the patients are likely to encounter trouble thinking. Often, most of the strike patients become forgetful. Also, another symptom of a stroke is loss of balance. With the destruction of the brain cells, a stroke patient is likely to experience coordination and balance problems, severely affecting the movement from one place to another (Monahan 2019). Therefore, individuals would be forced to use walking aids such as walking frames. From the stroke case study, the male patient got tired quickly, and thus, it is clear that he exhibited symptoms of a stroke.

Stroke results in a strength deficiency, and therefore, the patients may faint at times and experience seizures. Further, with the loss of coordination and balance, the patient in the case study experienced difficulties in speaking. Thus, stroke has the effect of interfering with speech. With the brain's interference, patients suffering from stroke may depict problems with vision,

such as dimness. Likewise, another symptom is severe and unending headaches with no well-established cause (Lapchak et al. 2018). Through such, the patients would portray sickling characteristics primarily if the stroke occurs suddenly. Another common symptom of a stroke is vomiting or nausea. Therefore, there are diverse stroke symptoms, and the symptoms also range from one person to another.

Types of stroke

Scientifically, strokes are categorized into three main types.

Ischemic Stroke

Ischemic stroke is the most common form, accounting for approximately 87% of all cases. It occurs when a blood clot obstructs circulation, depriving a region of the brain of oxygen and nutrients (Fonseca & Ferro, 2021). The symptoms vary depending on the area of the brain affected but often include vision disturbances—such as blindness in one eye or double vision weakness or numbness in the limbs, dizziness, and impaired coordination. Healthcare professionals emphasize the importance of seeking immediate treatment at the first sign of these symptoms, as timely intervention is critical to minimizing long-term damage.

The clots that cause this type of stroke typically begin from the heart before circulating to the other parts of the circulatory system. The clot may be lodged in the artery, or it can break by itself in some instances. Cells of the brain begin to die when the brain does not get enough supply of oxygen (Samaniego & Hasan 2019). When plaque breaks off the artery and travels to the brain, ischemic stroke caused by fatty buildup happens. The arteries may also be narrowed when the plaque buildup in the arteries, resulting in ischemic stroke. When oxygen flow to the brain is severely reduced, global ischemia, which is a more severe type of ischemic stroke, occurs. High blood pressure, high cholesterol, and sickle cell anemia are some of the risk factors for this type of stroke. Similarly, according to Morrison (2014), smoking and diabetes are also potential factors that may lead to this type of stroke. In the case study, the male patient had a

history of diabetes and smoking. Therefore, it is likely that he could be suffering from an ischemic stroke. To diagnose ischemic stroke, a doctor can usually use a physical examination and family history. Similarly, the location of the blockage may be established based on the symptoms. Monahan (2019) asserts that a blood sugar test may, however, be performed on a patient if they have symptoms such as confusion and slurred speech, and this is because low blood sugar is also associated with confusion and slurred speech.

To distinguish ischemic stroke from other issues that may lead to brain tissue damage, such as hemorrhage of brain tumor, a cranial CT scan can also help. To establish when the ischemic stroke began and the root cause, the doctors may use MRI and blood tests for cholesterol and problems associated with clotting. Treatment of ischemic stroke involves the restoration of heart rate and also blood pressure to normal (Dow et al., 2017). Medication can then be used to reduce the pressure in the brain. However, with the increasing inclination toward natural products, the doctors may prescribe a specific dosage of natural medications, which would also work effectively and efficiently. Over the past, the United States of America has developed natural products that have proven effective and provide immediate intervention for stroke. Natural products have also been used in suppressing stroke and reducing its prevalence in the country.

Hemorrhagic stroke

13% of stroke cases are associated with hemorrhagic stroke. The type of stroke is due to ruptures caused by weakened vessels that bleed into the surrounding brain. The surrounding brain tissues are thus compressed by the blood which has accumulated. Subarachnoid hemorrhage and intracerebral hemorrhage are the two main types of this type of stroke (Grotta 2016). The two main blood vessels which rupture to cause hemorrhage stroke are aneurysms and arteriovenous malformations (AVMs). Blood bleeding from the arteries into the brain causes a hemorrhagic

stroke. Therefore, there would be dysfunction of the body parts controlled by the damaged areas.

Symptoms

The symptoms of this type of stroke are extreme and require urgent emergency care. One of the symptoms of this type of stroke is a vision change, a common symptom of stroke (Caplan et al. 2012). Similarly, severe headaches and numbness are also some of the symptoms. Further, difficulty in speaking and loss of consciousness are also some of the symptoms which can be seen. Additional symptoms of this type of stroke may be tremors in the hands, sensitivity to light, and loss of taste in the mouth.

Diagnosis

A thorough medical history and physical examination are involved in diagnosing hemorrhagic stroke. Based on the patient's symptoms, the doctors may strongly suspect bleeding inside the skull. To help determine whether the stroke was due to a clot (ischemic stroke) or bleeding from inside the brain (hemorrhagic) may be established through imaging tests. Magnetic resonance imaging (MRI) or computed tomography (CT) are examples of imaging tests that may be conducted to develop the type of stroke (Sloane et al., 2019). To confirm the diagnosis of a hemorrhagic stroke, an electroencephalogram (EEG) or lumbar puncture may be conducted. Therefore, the tests would help ascertain the exact type of stroke that a patient is having, which would also help in making referrals and the prescription of medications.

Treatment

Immediate emergency medical care is necessary for patients who are experiencing the symptoms of a hemorrhagic stroke. Life-threatening complications may be avoided through prompt medical attention and more widespread damage to the brain. The critical determinants of the treatment for hemorrhagic stroke are the cause, where it's located, and the size of the hemorrhage. Similarly, medicine can be administered to reduce seizures, pain, and swelling.

Also, after establishing the type of stroke, the patients may be given natural medications that have proved to be more effective and efficient. From the case study, the patients felt relieved after a short period, bringing out their effectiveness. The positive attitude that has been witnessed in the United States of America towards natural products has also led to increased usage in the treatment of certain diseases after diagnosis.

The stroke patients have been the beneficiaries of the natural medications, and with their affordability, the patients have found relief (Fonseca & Ferro 2021). Therefore, the United States of America, through the department of health, should prioritize conducting more research on how to make natural products more effective and efficient and increase accessibility to more Americans.

Transient ischemic attack (TIA):

A stroke that lies only a few minutes is a transient ischemic attack. TIA is mainly attributed to a slight shortage of blood supply to a specific part of the brain. The symptoms of this kind of stroke are similar to the other types of strokes. One of the symptoms is numbness and weakness, which lasts for a short period. Similarly, this type of stroke is associated with dizziness and difficulties in walking (Dow et al., 2017). On most occasions, the symptoms only last for one hour but may last for 24 hours in extreme cases. The risk of this type of stroke may be minimized by taking drugs such as thinners, and also surgery may be recommended by a doctor.

Symptoms

The signs exhibited by ischemic stroke are similar to those that TIA demonstrates. One of the symptoms is weakness or paralysis in the face. The numbness is usually felt on one side of the body. Likewise, according to Alexandrov (2011), double vision or blindness in one eye and slurred speech. Depending on the area of the brain involved, one may have more than one

TIA, and the recurrent signs and symptoms may be similar or different.

To fully treat all types of stroke and reduce the chances of recurring, it is vital to change an individual's lifestyle. The natural products can only be fully effective when the patient quits certain habits, which exposes them to stroke. One of the ways of ensuring the effectiveness of the natural products while treating stroke is quitting smoking (Rahman et al. 2020). Smoking is one of the risk factors for stroke, and therefore, to avoid further complications and enhance the effectiveness of drugs, smokers need to quit smoking. Similarly, one should partake in a fully balanced diet with lots of fruits and vegetables. Exercising is also another risk factor that may expose an individual to stroke, and thus, regular exercise would help reduce the prevalence of stroke.

Conclusion

Conclusively, it is essential to develop government policies that control the usage of natural products to avoid misuse and overdose. Therefore, over-the-counter prescriptions should be monitored by the government. From the case study, both the two patients felt relieved after some time, which portrays that natural products are effective. Further, the United States America government should allocate more finances to researching the various natural products to identify their efficacy. Additionally, the United States of America citizens should be educated on the importance of natural products, which would help positively influence their attitudes and concerns. Therefore, it is the role of the government, through the health department, to develop regulations on the usage of natural products and clearly outline the dosage.

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