Prevention to Intervention in the Face of Stroke.

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Stroke is known as one of the leading causes of death and disability in the United States with more than 795,000 occurring each year, a new one every 40 seconds (Centers for Disease Control and Prevention [CDC], 2024). A stroke is caused by overall damage to brain tissue either due to lack of oxygen or increased swelling and pressure. Stroke can heavily affect a person's quality of life due to the loss of brain function and neurological deficits that a patient may encounter after. It is common for a patient to be left with deficits in speech, movement, memory, and motor function. With stroke being one of the leading causes of death and disability worldwide, it is not to be underestimated. Early screening, prevention, and treatment are key to minimizing the detrimental long-term effects of stroke on the brain.

Statement of the Problem

Stroke can occur in two different forms and "About 87% of all strokes are ischemic strokes, in which blood flow to the brain is blocked" (CDC, 2024). Ischemic stroke results from inadequate blood flow to the brain due to an occlusion in an artery which deprives brain tissue of oxygen and causes permanent tissue death. An ischemic stroke can be further classified as either thrombotic or embolic. Thrombotic being caused by a thrombus which is a stationary blood clot that stays in the same area it formed in. Whereas embolic is caused by an embolus which is a piece of an original blood clot that travels from its original place until it becomes lodged. It is also possible for someone to experience a transient ischemic attack, which occurs when blood flow to the brain is temporarily occluded but does not cause permanent brain damage. The other lesser common form of stroke is known as a hemorrhagic stroke, which is caused by bleeding into the brain due to a ruptured blood vessel. A hemorrhagic stroke can then be further divided into an intracerebral hemorrhage, or a subarachnoid hemorrhage based on where the bleeding is occurring (Bussard, 2023).

It is commonly known that if someone starts to experience sudden arm numbness, at least one person will begin to panic. This is because it is one of the most known and acknowledged early symptoms of a stroke. While this symptom is not to be taken lightly it is also not the only telltale symptom that may occur. An easy way to remember all the early symptoms associated with stroke is the mnemonic BE FAST. Which stands for Balance, Eyes, Face, Arm, Speech, and Time. These symptoms present as unsteady balance, blurred/loss of vision, drooping of the face, numbness of the arm, difficulty with speaking or being understood, and time stands for calling emergency services as soon as possible. The faster a person is brought into the hospital the more brain function and tissue that can be preserved.

Through research it was found that “Stroke reduces mobility in more than half of stroke survivors age 65 and older” (CDC, 2024). This is usually due to the paralysis and weakness that commonly occurs after a stroke. If stroke occurs on the right hemisphere, then left sided deficits are present. Vice versa, if stroke occurs in the left hemisphere then right sided deficits are present. Vision changes, inadequate depth perception, loss of coordination/balance, memory deficits, headache, speech difficulty, and behavioral changes such as depression are common after stroke (Clinicalkey, 2024). Stroke itself left untreated would not only affect the actual patient but would also heavily affect the nursing community. Without being able to treat stroke death would most likely occur in thousands of patients every year which could be extremely detrimental to the mental health of the nurses taking care of these patients. This could eventually lead to an increase of depression and anxiety in the nursing community.

Risk Reduction/Treatment of the Problem

Stroke can be influenced by non-modifiable risk factors such as age, gender, anatomy, medical conditions, ethnicity, and family history. However, stroke is often a result of modifiable

risk factors such as diet, exercise, and tobacco/alcohol consumption. Diets high in cholesterol, obesity, lack of exercise or living a sedentary lifestyle, and high amounts of tobacco/alcohol consumption greatly increase the risk of stroke. Educating high risk populations on the risks they are facing with stroke can greatly decrease the prevalence of stroke. Studies have shown that decreased education on stroke and its risk factors leads to a higher prevalence of ischemic, large-artery, and small-vessel stroke, as well as with intracerebral hemorrhage (Harshfield et al., 2021). Research shows that “Hypertension is ubiquitously the major modifiable risk factor for stroke, accounting for one-third of stroke in developed countries and two-thirds in developing countries” (Deiner & Graeme, 2020). An efficient way to decrease the chances of stroke is by controlling high blood pressure which can be done through diet, specifically the DASH diet. DASH focuses on increasing fruits/vegetables and decreasing foods with high sodium, added sugar, and saturated fat. A systematic review found that adherence to the DASH diet reduced blood pressure in both normotensive and hypertensive adults. It also found that following this diet led to a decrease in waist circumference and triglyceride concentration in hypertensive patients. These positive health modifications can greatly decrease the chances of a stroke in adherent patients due to the positive effects on controlling hypertension (Theodoridis et al., 2023). Other common ways to decrease hypertension are by increasing exercise, smoking cessation, and decreasing alcohol consumption. A very commonly used way of preventing stroke especially ischemic stroke is the daily use of aspirin for its antiplatelet effects. A meta-analysis was done using 135,641 participants in 2022 that examined the effects of daily aspirin administration. It was found that aspirin significantly decreased the risk of cardiovascular events such as ischemic stroke, without a significant increase in risk of hemorrhagic stroke (Gdovinova et al., 2022). Smoking cessation is another important way to greatly decrease the risk of stroke. Smoking

tobacco severely damages blood vessels and contributes to atherosclerosis, which increases the risk of an occlusion occurring. Providing patients with resources such as support groups and smoking cessation counseling along with the use of nicotine patches/gum can increase the chances of a patient decreasing tobacco consumption which in return decreases the chance of stroke.

The easiest way of evaluating risk for stroke is through the determination of predisposing factors. This is done by determining diet, smoking habits, alcohol consumption, hypertension, cholesterol, exercise, family history, and more. Each risk factor the patient is experiencing, the more likely they are to experience a stroke. For example, a patient with uncontrolled hypertension who eats an unhealthy diet, does not exercise, and has high cholesterol is at a huge risk for stroke as they are experiencing multiple predisposing risk factors.

While prevention is a huge part of stroke, it is inevitably going to happen and that is where having successful treatment options are needed. When treating ischemic stroke, the main goal is to address the clot that is occluding blood flow to the brain. The most common treatment of this is the implantation of intravenous thrombolytics, which go in and dissolve the clot causing a return of oxygen to brain tissue. The most popularly used intravenous thrombolytic is known as tPA, which is commonly used as the first line treatment for an ischemic stroke (Baig & Bodle, 2023). On the other hand, treatment for a hemorrhagic stroke focuses on controlling bleeding and decreasing blood pressure. Controlling the bleed can be done through surgical procedures such as a craniotomy, endoscopic aspiration, surgical clipping, or catheter aspiration. Stabilization of blood pressure and decrease in intracranial pressure is also key alongside controlling bleeding. This is done by gradually lowering blood pressure with the use of beta blockers until a reading of 150/90mmHG is reached. Along with raising the head of bed to 30 degrees and using osmotic

agents to pull fluid away from the brain which in return decreases intracranial pressure (Unnithan et al., 2023).

Planning of Teaching Content

The biggest takeaway for the public with any lesson on stroke should be prevention and early identification. It is important for the public to know what their lifestyle choices can lead to, and how they can implement changes such as changing to a lower sodium diet to reduce their risk of stroke. This can be taught to the public through things such as commercials, pamphlets, and informational handouts. Health fairs and community events are key to providing information to the public for them to take home and entice further research on risk. It could also be extremely beneficial for BE FAST to be taught to anyone of around high school age during their mandatory health classes. While it may seem unusual to teach everyone in health class this mnemonic, it could possibly save a person's life someday. If more of our population knows the signs to look out for it could increase the amount of people taken to the hospital within enough time to preserve brain function during a stroke. Props such as models of the brain, fake blood clots, and fake arteries with atherosclerosis could be used to show the public what can't be seen with the public eye and open their eyes to what stroke can truly do.

Conclusion

Stroke consistently stays one of leading causes of deficit and disability in the United States every year. Finding effective modes of treatment and prevention is key to the reduction in number of strokes yearly, and the prevention of brain damage when stroke inevitably occurs. With the use of community teaching and outreach programs for public education and prevention, the prevalence of stroke could be decreased greatly in the United States.

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