Ischemic Cerebral Stroke Case Report, Complications and Associated Factors

Dr. Mahmoud Abdul Hameed Shahin

Al-Ghad International Colleges of Applied Medical Sciences, Al-Qassim- KSA

Corresponding Author: Dr. Mahmoud Abdul Hameed Shahin
mahmood81us@yahoo.com

ABSTRACT

Cerebral stroke (CVA) is a medical emergency that can cause permanent neurological damage or even death. According to the WHO statistics, stroke was the second most frequent cause of death worldwide in 2012 and the main cause of disability. The present study reported 82 year-old female case admitted to the medical department of the Jordan University Hospital through the ER with hypertension, right side weakness, global aphasia, tongue heaviness, dysphagia and was diagnosed with ischemic stroke. Even though more data is emerging about CVA, more efforts are needed to understand risk factors, treatment options, associated complications and stroke-related complications. In this case, the treatment options were discussed as well as some complications associated with ischemic cerebral stroke. In conclusion, post-stroke infection is common among hospitalized patients as a result of compromised immunity; however, this infection may take different forms like pneumonia, urinary tract infection or other forms of infections. Utilizing proper measures for prevention, early detection and management using proper antibiotics are of vast importance for patients post cerebral stroke. On the other hand, Gallbladder stones and cholecystitis are common complications developed after cerebral stroke and prolonged immobility for bedridden patients. CK-MB elevation post stroke is not likely to be of a cardiac origin.

Keywords: Cerebral Stroke, Indications, Associated Factors

1. INTRODUCTION

A stroke sometimes referred to as a cerebrovascular accident (CVA), or colloquially brain attack is the loss of brain function and tissue damage due to a disturbance in the blood supply to the brain tissues. This disturbance is due to either ischemia (lack of blood flow) or hemorrhage (1). Cerebral stroke is a medical emergency that may cause permanent neurological damage or even death. Furthermore, the WHO statistics have shown that CVA was the second cause of death worldwide in 2012; however, it was accounting for 6.7 million deaths in that year only (2). In contrast, studies have shown that 17 million people who have had a stroke in 2010 added to another 33 million people who have previously had a stroke were still alive due to proper medical management. Stroke is becoming a leading cause of death and adult disability in the developing countries. It is one of the common health problems in the Middle East region. In Jordan, for instance, there are no accurate statistics about cerebral strokes from Jordanian hospitals or the ministry of health; however, some studies in Jordan were focused on types, complications associated and risk factors of CVA. In 2012, a study conducted over two years on ischemic stroke patients in Jordan found that the mean age was 61.2 years and the most common stroke subtype was lacunar infarction (presented predominantly as pure motor stroke), while cardioembolic stroke was rare. The most common risk factors for atherosclerotic stroke were Hypertension, diabetes mellitus, atrial fibrillation and smoking (3).
2. CASE PRESENTATION

S.N, 82 year-old female patient admitted to the medical department of The Jordan University Hospital through the emergency department with a persistent headache, right side weakness, global aphasia, trouble with speaking, numbness of the face and arm, tongue heaviness and dysphagia, dizziness and unsteady gait. The vital signs were: temperature: 37 C orally, BP: 190/110 mmHg, heart rate: 86 beats/min, respiratory rate was 16 breaths/min. A nasogastric tube was inserted for enteral feeding.

Brain CT scan and MRI showed moderate ischemic infarction of the left brain hemisphere (Fig.1) and (Fig.2). There were no apparent precipitants of thrombosis (i.e., no trauma, intoxication, or dehydration), but an only risk factor for vascular disease was hypertension.

The patient had no past medical and surgical history except for hypertension. She was not a smoker with no significant family history. There was no evidence of an immunologic disease.

A few days after admission, the patient developed alteration in laboratory results and developed a urinary tract infection. On the other hand, it was found that the patient has a cholecystitis.

A general physical examination was completed, the patient was conscious, alert and oriented, no lower limb edema. Lungs were clear to auscultation. Heart rate was normal, and the rhythm was regular, no murmurs or gallops, no carotid bruits and no lower limb edema.

In the neurologic assessment, hemiparesis to face and arm was more than that to the leg. The patient had dysarthria, global dysphasia, and visual field deficit. Cranial nerves examination revealed impaired gag reflex, swallowing problem, weakness of chewing movement, unilateral loss of sensation, reduced control of eye movement (partial gaze palsy) and minor facial palsy.

Motor and sensory examination revealed right arm and leg motor and sensory deficit. Right side hypertonia was noticed with the diminished vibratory sense to the forefoot. The power was 2/5 in the right side and 5/5 in the left side. Hyperactive deep tendon reflex in the right side was noticed with negative Babinski reflex.

Regarding the investigations, brain MRI showed ischemic infarction involving the left temporal lobe below the Sylvian fissure (Fig.2). Area of involvement corresponds to the left middle cerebral artery inferior division territory. The bifurcation of both carotid arteries was seen without gross abnormalities.

Abdominal CT scan revealed a distended gall bladder that is filled with Sludge and multiple gall bladder stones; findings were suggestive of acute gallbladder stone. Cardiology investigations, including electrocardiography, did not reveal any abnormality. On admission, routine blood parameters showed normal blood chemistry with decreased level of...
Creatinine and calcium. Labs revealed normal hematological studies; elevation in CK-MB to 14. LFT was normal while the lipid profile showed a significantly high level of blood cholesterol and triglyceride. However, prothrombin and partial thromboplastin times were not requested.

After 3 days of admission, WBCs increased significantly from 9.7 to 17.7, lymphocytes decreased, and urine analysis showed bacterial growth and proteinuria. ALT, AST, and LDH were elevated after 10 days of the stroke; simultaneously, albumin and total protein decreased below normal.

Based on the medical history, patient’s records, physical exam and lab results, the patient had the following problem list: Ischemic stroke (right side weakness and dysphasia), cholecystitis, urinary tract infection, hypalbuminemia, hypertension, dyslipidemia, leukocytosis, and thrombocytopenia.

Health problems based on the nursing diagnosis include self-care deficit, impaired physical mobility, altered nutrition less than body requirements, non-compliance to the therapeutic regimen, and knowledge deficit regarding cerebral stroke.

The differential diagnoses may include (Ischemic Stroke, Hemorrhagic stroke, TIA, Seizure, Sepsis, Brain tumor, and toxic-metabolic disorders, such as hypoglycemia).

Regarding the management of ischemic stroke, the definitive therapy of ischemic stroke aims to remove the blockage by breaking the clot down (thrombolysis), or by removing the clot mechanically (thrombectomy). While only 1 drug, recombinant tissue-type plasminogen activator (rt-PA), has demonstrated efficacy and effectiveness in managing acute ischemic stroke, other drugs are equally important (4). National consensus panels in the USA have included the use of antihypertensives, anticonvulsants, and osmotic diuretic agents in their recommendations for treatment. Additional agents might be required to handle co-morbid illnesses in many patients with stroke.

Drugs for the management of ischemic stroke can be distributed as Reperfusion, Anticoagulation, Antiplatelet and Neuroprotective (4). Thrombectomy is the emergency surgical removal of emboli or thrombi which are blocking cerebral blood circulation using catheterization. Thrombectomy is often used as the last choice for management because permanent occlusion of a significant blood supply to the brain may lead to ischemia and eventual necrosis of brain tissues (4).

Health education for the patient and family members should be provided regarding the disease process of cerebral stroke, a management protocol, medication regimen, nutrition and feeding, rehabilitation and physiotherapy.

The primary goal of stroke management is to minimize brain injury and promote maximum patient recovery. Early detection and appropriate emergency medical care are crucial for optimizing health outcomes. Once patients are clinically stable, the focus of their care shifts to rehabilitation. Rehabilitation programs are usually facilitated by a team that may include a physician, physiotherapist, nurse, occupational therapist, speech and language therapist, psychologist, and recreational therapists (5). The patient and their family also play an important role in this team. The primary goals of recovery include preventing stroke’s associated complications, minimizing impairment and achieving functional abilities that promote independence in client’s activities of daily living. Current evidence indicates that most significant recovery achievements will occur within 12 weeks following a stroke (5).

3. DISCUSSION

Based on the clinical picture and laboratory results of the case studied, it was found that the patient developed a urinary tract infection and elevation in WBCs with low lymphocyte count 3 days after admission.

In literature, many studies were supporting the risk of infection development for patients post cerebral stroke. In a systematic review and meta-analysis study conducted by a group of researchers in 2011 to estimate post-stroke infection rate and its effect on the outcome, 87 studies were included involving 137817 patients (6). The overall infection rate among patients with cerebral stroke was 30% (24-36%) within 5 days after stroke; rates of pneumonia and urinary tract infection were 10% each. In ICU studies, the rates of infection after stroke were substantially higher with 45% overall infection rate, mainly pneumonia, and urinary tract infections. In studies that included older patients or more females, higher rates of urinary tract infection were reported. On the other hand, pneumonia was significantly associated with death among stroke patients (6). Mortality is higher in these patients, and the severity of the stroke is the strongest determinant of the infection risk.

Many patients develop infections shortly after acute stroke regardless of optimal management. The most
common complications following stroke included chest infection, fever, hypo-albuminemia, arrhythmia, irritable ulcer, gastrointestinal dysfunction, recurrence of stroke, urinary tract infection, and immunosuppression (6). Based on the report of the abdominal CT scan, it was found that the patient has multiple gallbladder stones and cholecystitis. Cholecystitis in patients post stroke was investigated in a few studies around the world. In accordance with that, a recent study was conducted on a large sample size to evaluate the risk factors for acute cholecystitis in the department of surgery at a university hospital in Seoul, Korea. 1059 Patients who underwent laparoscopic cholecystectomy for symptomatic gallstones were taken in the period from 2004 to 2007 and found that the history of cerebrovascular accident (ischemic stroke or cerebral hemorrhage) was identified as an independent risk factor for acute cholecystitis. Approximately 85% of the patients who had a history of a cerebrovascular accident were presented with acute cholecystitis (7). In the same context, the complication rate after the laparoscopic cholecystectomy for the patients with a history of CVA was also higher than for those patients without a history of CVA (7).

On the other side, a study was conducted on a convenience sample of 24 patients with an acute cholecystitis after an acute cerebral infarction. The study found that acute cholecystitis after acute cerebral infarction is rare and has not been fully investigated because patients with acute cerebral infarction often cannot complain of abdominal pain due to loss of consciousness, hemiparesis, and aphasia (8). Among the 1,682 patients with acute cerebral infarction admitted to a hospital in Japan between 2007 and 2012, twenty-four patients only were diagnosed with acute cholecystitis post acute cerebral infarction, and that represents 1.4% only of the total sample population. Acute cholecystitis post an acute cerebral infarction was frequently observed in patients with severe hemiparesis and those who were fasting. 23 (96%) CVA patients out of 24 were bedridden at the onset of cholecystitis (8).

In the study, the mean age of the 24 patients was 74.2 years. The clinical type of the cerebral infarction was atherothrombosis (5 patients), lacunar infarction (7 patients), cardiac embolism (10 patients) and dissection (2 patients). The past history included atrial fibrillation (10 patients), hypertension (20 patients) and diabetes (11 patients). The mean interval between the onset of cholecystitis and admission was 8.3 days (8).

The lab investigations performed on admission for our patient detected a remarkable elevation in serum creatine kinase myocardial subfraction (CK-MB). This CPK marker is known to be a specific cardiac marker for a myocardial infarction; on the contrary, other normal specific cardiac enzymes and isoenzymes, normal ECG and the negative clinical manifestations were not supporting the possibility of myocardial necrosis.

In a study conducted to assess the relationship between stroke and Creatine Kinase-MB elevation compared to troponin T, daily enzyme levels of troponin T & CK-MB for 32 patients with large hemispheric infarction and with no history of coronary heart disease were compared to a control group of 22 patients with neurological diseases other than stroke. The study found that normal troponin T along with elevated CK-MB signifies that CK-MB is not the biological marker for myocytolysis. CK-MB elevations in stroke patients are likely to be non-cardiac in origin (9). Additionally, ECG changes were observed in 32% of patients. ECG changes are suggesting the possibility of the insufficient sensitivity of ECG in detecting acute myocardial injury.

Cardiac enzymes like (CK-MB) which are specific for myocardial infarction loses its specificity in patients with stroke. CK-MB level elevation in these patients does not necessarily indicate any myocardial injury (9). Hypoalbuminemia was recently studied by a group of researchers in Poland. The research assessed albumin level in 705 acute ischemic stroke patients with first-ever ischemic stroke admitted to the stroke unit within 24 h after stroke onset (10). A high frequency of hypoalbuminemia in acute stroke patients was noticed. Hypoalbuminemia is a frequent finding in acute stroke patients, and it was associated with more severe stroke. Additionally, a negative correlation was detected between serum albumin level and the degree of neurological deficit (10). Hypoalbuminemia in acute stroke patients could be a result of malnutrition, underlying disease processes like renal or hepatic insufficiency, uncontrolled heart failure or malignancy (10).

4. CONCLUSION

Post-stroke infection is common among hospitalized patients as a result of the suppression of immunity, which may take different forms like pneumonia, urinary tract infection or other forms of infections. Utilizing proper measures for prevention, early detection and management using proper treatment and
prompt use of antibiotics are of vast importance for patients post cerebral stroke. Additionally, Gallbladder stones and cholecystitis were common complications associated with cerebral stroke and prolonged immobility for bedridden patients. CK-MB elevation post stroke is not likely to be associated with cardiac causes and should be investigated. Hypoalbuminemia is a frequent finding in acute stroke patients, and it was associated with more severe and complicated strokes.

REFERENCES