First Successful Thrombolysis in Ischemic Stroke in Burkina Faso

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Abstract

Authors report a case of success of stroke thrombolysis with streptokinase in a 72-year-old woman. Patient’s son called directly intensive care unit in cardiology for direct hospitalization. The authors emphasize that studies on streptokinase should be conducted in developing countries in order to propose treatment in patients with ischemic stroke pending recombinant tissue plasminogen activator (rt-PA) advent.

ABBREVIATIONS

AM: Ante Meridian; EKG: Electrocardiogram; HAS-BLED: Hypertension Abnormal Renal and Liver Function Stroke - Bleeding Labile INR Elderly Drugs or Alcohol; IV: Intravenous; MRI: Magnetic Resonance Imaging; NHISS: National Institute of Health Stroke Score; SpO₂: Pulsed oxygen saturation

INTRODUCTION

Stroke is an absolute emergency [1]. It remains the second leading cause of deaths globally and first cause of disability [2]. According to the World Stroke Society campaign highlights, one in six people in the world will suffer a stroke in their life time [3]. Around 80% of stroke is ischemic, of which one third is a thromboembolic mechanism [4].

Intravenous thrombolytic therapy has been widely recommended as a standard treatment for acute ischemic stroke in most clinical practice guidelines. With the approval of tissue plasminogen activator (t-PA) for the acute ischemic stroke management, the evolution of this emergency has changed dramatically.

However, lack of stroke unit and financial inaccessibility to tissue plasminogen activator make thrombolysis in stroke virtually unthinkable in our country. Yet stroke is the main pathology in the neurological service of reference in our country. The average time between the onset of symptoms and the first medical contact is 6h and 56min [5]. As other medical emergencies, there is no national strategy for managing strokes in our country. We present the first case of ischemic stroke successfully thrombolysed in our country.

CASE PRESENTATION

Mrs. SK 72 year-old was received on April 30, 2017 in cardiology intensive care unit for acute left side paralysis. In the story Mrs. SK was hospitalized in a Private Medical Structure a week ago because of fatigue, palpitations and lower limbs edema. Undertaken medical investigations had demonstrated a trial fibrillation on severe renal insufficiency (creatinine clearance at 17 ml/min). She benefited from furosemide with potassium supplementation, aspirin and amiodar one as treatment but no anticoagulation therapy. One week after this hospitalization, Cardiologic Intensive Care Unit (ICU) was contacted by the patient’s son for a sudden left side deficit that onsets at 4 AM. Patient was admitted one (01) hour later in ICU in cardiology. On examination, consciousness was clear, colored conjunctiva, blood pressure at 90/50 mmHg, heart rate at 77 bpm, temperature at 36.3 degrees, SpO₂ = 99% in ambient air, a Right pyramidal syndrome and arrhythmia. Cardioembolic stroke was suspected and an emergency brain scan (Figure 1) was immediately performed and eliminated cerebral haemorrhage. The EKG (Figure 2) indicated atrial fibrillation with an irregular ventricular response at 77 cpm. Serum creatinine was 232.49 micromoles/l (clearance of 16.73 ml/min), azotemia at 9.45 mmol/l, blood glucose at 7.09 mmol/l, blood group-rhesus was O+. Final hypothesis was ischemic cardioembolic stroke on severe chronic renal failure. Decision to thrombolysée was rapidly taken and after NHISS score calculation (Which was 20) and exclusion of thrombolysis contraindications, thrombolysis was started at 6 h 58 min AM (2h58min after symptoms onset). Hemisuccinate hydrocortisone was used as premedication to prevent streptokinase immunologic effects. Streptokinase 1500 IU was used during two (02) hours without any incidents or accidents. At 10 hours 10 min AM, there
was a functional recovery at 4/5 for the upper limb and 3/5 for the lower limb and at 12h AM; the muscle strength was 4/5 on both limbs. Complete functional recovery (muscle strength 5/5) was observed the next day.

Cerebral MRI (Figure 3) performed on May 3, 2017 (post-thrombolysis) showed acute ischemia in the superficial and deep territories of the right middle cerebral artery. The patient was discharged after 10 days hospitalization. She is currently an outpatient in neurology, cardiology and nephrology. Atrial fibrillation has been reduced under amiodarone and now she has a first degree atrioventricular block (Figure 4).

DISCUSSION

Management of acute ischemic stroke is a global challenge. It is a race against the clock. Its effectiveness should be based on a well-structured strategy including population, with specific objectives [6]. Time plays against efficiency. Currently, intravenous (IV) administration of recombinant tissue plasminogen activator (rt-PA) within 4.5 hours of symptom onset is the only medical therapy shown to improve outcomes in acute ischaemic stroke [7-9]. It has become the standard of care in many international stroke centres.

Essential requirements for stroke thrombolysis include availability of CT scanning and arrival at hospital within 4.5 hours of symptom onset. However, in developing countries where the prerequisites are met at certain centres, the efficacy and safety of thrombolysis have not been firmly established. Care delays are very long in our context. According to Napon et al. [5], delay from symptoms onset to first peripheral medical contact is on average of 6 h and 56 min. Thrombolysis delay is thus already exceeded.

Recombinant tissue plasminogen activator (rt-PA) therapy
has not been translated into clinical practice in the developing world primarily due to economic constraints. Streptokinase, a lower cost alternative thrombolytic agent, is widely available in developing countries where it is utilized to treat patients with acute coronary syndromes [10]. Thrombolysis advent is very recent in Burkina Faso. Streptokinase is the only available thrombolytic. And we do not have catheterism laboratory in our country. Thus acute ST elevation myocardial infarctions are treated by fibrinolysis using streptokinase. Patients are secondarily evacuated to Côte d'Ivoire, Senegal, Maghreb or France after the acute phase, for angioplasty.

Our patient is certainly an anecdotal case with renal deficiency and HS-BLED score at 5. This is the first thrombolysis in Burkina Faso. But the success of thrombolysis with streptokinase in this case revives the interest of studies on this drug in low-income countries and other alternative treatment ways.

Indeed, given the high cost of rt-PA, alternative therapies should be explored for developing countries. Martinez de Lizarrondo S, et al., experimentally demonstrated that intravenous N-Acetylcysteine administration promotes lysis of arterial thrombi that are resistant to conventional approaches such as recombinant tissue-type plasminogen activator, direct thrombin inhibitors, and anti platelet treatments [11]. We particularly hope that this antithrombotic alternative is very beneficial for low income countries. Clinical studies deserve to be carried out in order to allow the use of N-Acetylcysteine in the treatment of arterial ischemia of thrombotic origin. Staphylokinase is a plasminogen activator of bacterial origin with pronounced fibrin specificity. The first clinical studies suggest that recombinant Staphylokinase constitutes an effective thrombolytic agent. This is also an interesting alternative from rt-PA use [12]. Our patient's child directly called cardiologist for direct hospitalization in cardiac intensive care unit and CT-scan was available on place. That demonstrated the importance of social contribution in stroke care.

CONCLUSION

This is the first case of ischaemic stroke thrombolysis in Burkina Faso. Result is encouraging. Given the high cost of rt-PA, a new trial of streptokinase in acute ischaemic stroke, utilizing stricter inclusion criteria similar to those in more recent thrombolytic studies, appears warranted. With the same idea, the use of Staphylokinase and N-Acetylcysteine must be encouraged through clinical studies. This will make it possible to popularize thrombolysis in low-incomes countries.

REFERENCES