CASE REPORT

Occurrence of Guillain-Barré syndrome as an immune mediated complication after thrombolysis with streptokinase for acute anterior wall myocardial infarction: a caution to be vigilant

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SUMMARY

Guillain-Barré syndrome (GBS) constitutes a heterogeneous group of immune-mediated peripheral neuropathic disorders that can be triggered by a variety of antecedent events. Clinical symptoms are thought to result from streptokinase antibody-mediated damage to the local blood-nerve barrier. We report the case of a 50-year-old man with acute anterior wall myocardial infarction who developed GBS as a manifestation of autoimmune hypersensitivity reaction to the drug 17 days after thrombolytic therapy with streptokinase. The patient was treated with a 5-day course of intravenous γ globulin and his symptoms improved and there was no residual deficit. The case forms a reminder of the autoimmune complications of non-fibrin specific agents that can sometimes be catastrophic and require persistent and vigilant in-hospital and immediate postdischarge follow-up and immediate management.

BACKGROUND

Guillain-Barré syndrome (GBS) is the prototype of immune-mediated peripheral neuropathies which forms a heterogeneous group with varying causation. A feature that is commonly seen in all forms of GBS is a rapidly evolving polyradiculoneuropathy, which is preceded by triggering event most often related to an antecedent infection.¹ There have been reports of the occurrence of similar cases of GBS after intravenous administration of streptokinase.²⁻⁶

We describe a case of GBS in a patient who received intravenous streptokinase therapy for the treatment of acute anterior myocardial infarction (AMI) and developed the symptoms of GBS after a week from the hospital discharge. We wish to publish this case as it is a very uncommon but very serious manifestation of streptokinase therapy, which needs to be kept in mind even after hospital discharge, as the consequence of negligence and ignorance can be catastrophic. It also is a learning experience for the physician and cardiologist who are often unaware that GBS can even occur as a potentially lethal delayed complication of fibrinolytic with agents that are antigenic and non-fibrin specific.

CASE PRESENTATION

We are reporting the case of a patient who was a 50-year-old man who presented to our emergency

department with retrosternal chest pain radiating to the left shoulder and left arm. It was associated with nausea and profuse sweating. An ECG showed ST elevation in V2–V4 precordial leads. Troponin-T was positive and creatine kinase-MB level was elevated to 8 ng/mL. The patient was thrombolysed with 1.5 million units of streptokinase and on the second day of admission a coronary angiogram was performed. The coronary angiogram revealed that the left anterior descending artery had proximal 90% stenosis that was subsequently taken up for angioplasty and was stented with Xience V (everolimus eluting DES) 3×18 mm stent. The patient was discharged in good general condition 5 days after coronary care unit admission.

Twelve days after discharge, the patient returned again reporting general lethargy and the sensation of pins and needles in his hands and feet from the previous day early morning. Detailed medical history of the patient revealed that there was no exposure to any drugs or toxins. Additionally, there was no evidence of any upper respiratory or gastrointestinal infection within the last 2 months. Medical history was also negative for arterial or venous embolism, connective tissue disease and vasculitis. The patient then developed progressive muscle weakness of his lower extremities as well as distal sensory impairment without bladder and bowel involvement. The weakness progressed and involved respiratory and bilateral facial muscles. He also reported difficulty in swallowing of liquid and solid food.

On physical examination the muscle power of extremities was decreased and the patient had a reflexia. The patient was conscious and alert and the funduscopy was normal.

INVESTIGATIONS

Blood cell counts and results of biochemistry tests were within the normal range. An MRI of the brain was normal. The patient was admitted to the intensive care unit (ICU) with clinical suspicion of GBS. A cerebrospinal fluid (CSF) analysis revealed a cell count 6 cells/mm³, protein 220 mg/dL and CSF-to-serum glucose ratio of 0.70. CSF cultures were negative. The patient subsequently developed respiratory failure and was intubated and mechanically ventilated. Nerve conduction velocity showed the following findings:

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1. Absent nerve conduction velocity of deep peroneal and ulnar nerves.
2. Absent sensory nerve action potential of bilateral median, ulnar and superficial peroneal nerves.
3. Absent bilateral H reflex and low frequency F waves.

These findings were suggestive of acute generalised peripheral sensory motor polyneuropathy.

TREATMENT

The patient was treated with five doses of intravenous immunoglobulin (Ig).

OUTCOME AND FOLLOW-UP

His condition gradually improved and 1 month later he was discharged from hospital with muscle power returning to grade 4 of 5 in all extremities.

DISCUSSION

The causation of GBS is a case of thrombolysis with a fibrinolytic agent is a rare entity and has seldom been reported.^{2–6}

GBS is a disease of an unknown aetiology but has been reported in association with viral infections, systemic lupus erythematosus, Hodgkin's disease and other situations like lymphomas.⁷ The mechanism of causation of GBS is known to be immune-mediated.

Streptokinase is an antigenic protein that is obtained from group C streptococci. Streptokinase is used as a fibrinolytic therapy for its cost effectiveness especially in developing countries. In the developed world the use of fibrin-specific agents is much more common and these agents are less immunogenic. Streptokinase may not be as effective as its newer congeners but is cost effective and is of use when percutaneous coronary intervention is not available. Streptokinase has always been proposed as the drug of choice in ST elevation MI in developing countries where cost concerns are important and the fibrin-specific congeners are beyond the affordability of the masses. Streptokinase also has some non-cardiac uses as in case of pulmonary embolism and deep venous thrombosis.

In our case a patient who had been inflicted with acute anterior wall MI developed GBS 17 days after receiving streptokinase. This is not the first case to have reported a correlation of streptokinase with the precipitation of GBS and other immune-mediated complications most of which are often acute.^{2–6}

The actual cause of occurrence of GBS in this case is difficult to predict accurately as it could be an incidental event with no correlation with the medications or treatment or it could be mediated by some other drug or agent that was received by the patient during the course of hospitalisation—the association of which has not yet been described, although in this case the patient was not administered any other possible agent to which the incidence of GBS could be incriminated upon.

The protein nature of streptokinase can precipitate immunological reactions.⁶ This is probably the basis of development of GBS after streptokinase therapy.

Kaiser *et al* has reported that after streptokinase therapy the titres of IgG, IgM and IgA immunoglobulins were elevated 64, 16 and 4 times, respectively, in comparison to controls. Nerve damage results from the damage caused by antibody to the blood–nerve barrier.^{7, 8}

There has been a case report of occurrence of GBS with the use of reteplase.⁹ There has also been the report of the occurrence of GBS in a case of acute stroke which was treated with rTPA¹⁰ and so we can ascribe the occurrence of GBS only to the immunogenic response evoked by agents like streptokinase as these cases have also occurred with fibrin-specific and non-immunogenic lytic agents. Whether any other mechanism is also involved in the causation of GBS besides the immune response to lytic agents and which are the incriminated antigens, needs further evaluation.

To conclude GBS can be seen late in the course of AMI suggestive of triggered autoimmune mechanisms. After the exclusion of other likely causes, this possibility should be considered in patients who develop signs and symptoms suggestive of GBS in the form of paraesthesia and muscular weakness after 10–30 days of infarction, especially if thrombolysed with antigenic lytic agents like streptokinase.

Learning points

- ▶ Guillain Barre syndrome (GBS) can occur as a potential life-threatening rare complication of thrombolysis.
- ▶ Early detection and appropriate management is paramount important for this rare complication.
- ▶ Postdischarge follow-up of such patients should be performed to prevent late onset catastrophic complications.
- ▶ Intravenous immunoglobulin or plasmapheresis is the treatment of choice for GBS.
- ▶ Fibrin-specific drugs should be used as far as possible for thrombolysis in acute myocardial infarction as these are non-antigenic but are not cost effective which is a concern in the developing countries is.

Contributors All authors have contributed to the drafting of the manuscript and were involved in the patient care.

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