Case Report

Ischaemic Stroke with Ovarian Hyperstimulation Syndrome

Amna Qazi¹, Aamir Nazir Ahmed¹, Mah Parveen Qazi², Faika Usman³, Arsalan Ahmad³

Department of Medicine¹, Department of Gynecology and Obstetrics², Section of Neurology³, Shifa International Hospital and College of Medicine, H-8/4, Islamabad, Pakistan.

Abstract

Ovarian hyperstimulation syndrome (OHSS) is a rare and serious complication of hormonal treatment for induction of ovulation. Haemoconcentration owing to the large fluid shift from the intravascular to the peritoneal cavity resulting in increased blood viscosity that can lead to arterial and venous occlusion. Thromboembolic stroke, cerebral venous thrombosis and systemic arteriovenous thrombosis have been reported in OHSS. We report a case of a 30-year-old female who had undergone successful in-vitro fertilization and presented in the emergency department with sudden onset of left hemiplegia. Her CT scan showed a full thickness right MCA territory infarct. The patient was treated with oral aspirin, intra venous plasma expanders and Mannitol. Her repeat MRI showed haemorrhagic conversion of infarct. She made a good recovery and was independent in activities of daily living when seen for follow up after six months.

Introduction

Ovarian hyperstimulation syndrome (OHSS) is considered to be a rare but serious phenomenon arising as a complication of hormonal treatment for induction of ovulation. OHSS is usually more severe during the first trimester of pregnancy. In its most severe form, this syndrome is characterized by massive ovarian enlargement and the formation of multiple ovarian cysts, fluid shifts resulting in extravascular accumulation and intravascular volume depletion, renal failure, hypovolaemic shock and in some cases, death. Thromboembolic stroke, cerebral venous thrombosis and systemic arteriovenous thrombosis have been reported in OHSS. The causes of thromboembolic phenomenon in OHSS remain unclear but haemoconcentration owing to the large fluid shift from the intravascular to the peritoneal cavity, results in increased blood viscosity that can lead to arterial and venous occlusion. Very few cases of cerebral arterial infarct secondary to OHSS are found in literature. To our knowledge, OHSS has not been reported from Pakistan. We report a case of OHSS with middle cerebral artery territory stroke secondary to in-vitro fertilization.

Case Report

A 30-year old married female presented to the emergency department with complaints of sudden onset left sided weakness of the body. (There was no history of any other symptoms). She had undergone successful in-vitro fertilization at a private clinic ten days prior to admission. In the emergency department Her pulse was 92/min regular, temperature 37°C, basic relevant work-up showed an AsT of 63U/L, elevated WBC count of 16,300/µL and haematocrit of 43.40%. Beta HCG level was 84.2mIU/ml.

On the day of admission, she was oriented and followed simple commands. She had a slurred speech. Her

References


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motor examination showed marked weakness of the left half of body (MRC grade 1/5). Deep tendon reflexes were brisk on the left side with an extensor plantar response on the left. CT scan of the head showed full thickness right MCA infarct. She was given aspirin 75 mg Q O.D. and haemaccil 500 cc over 5 hours, a normal saline bolus of 500cc. injection Mannitol 200cc q 8 hourly and Injection Ceftiaxone 1 gram I/V q 12 hourly. An urgent gynecological consult was done. Ultrasonography abdomen showed moderate ascites, right sided pleural effusion and large multicystic ovaries (right ovary 152mm x 98mm x 106 mm, left ovary 101mm x 98mm x 91mm) in both adenexa. She fulfilled the criteria for diagnosis of OHSS\(^1\) based on the clinical features, elevated beta HCG levels, ovarian enlargement and ascites on sonography and an elevated haematocrit. On the second day of admission her neurological examination showed improvement in speech and motor power on left side. The patient complained of mild headache. MRI of the brain was ordered. MRI showed small haemorrhage in the infarct (Figure). Carotid Doppler revealed mild carotid arteriosclerosis. Ascitic tap was negative for malignant cells. The daily routine lab tests including CBC and LFT's showed improvement over the next few days (Table). Anti DNA, hepatitis B and C serology were negative. Over the next five days she showed a steady improvement and was discharged home.

She came for follow-ups regularly and was last seen in February 2006. She was independent in activities of daily living.

**Discussion**

The incidence of OHSS is reported to be between 0.3% and 6% with the risk being increased by pregnancy.\(^1\) A recent review of the literature found 54 cases of thromboembolic disease associated with ovulation induction therapies and two thirds of these patients had OHSS. Most of the complications are venous occlusive disease of the upper limb, head and neck veins. The most common mechanism of stroke in OHSS reported in the literature is large artery occlusion, usually of the middle cerebral artery.\(^4\) Our patient also had full thickness right middle cerebral artery infarct.

Management of OHSS is often close observation but may require hospitalization for IV hydration with IV fluids and administration of human albumin 25%\(^5\) and supportive care. The successful use of rt-PA to lyse a cerebral arterial thrombus resulting from OHSS has been reported by Elford K et al.\(^6\) Our patient was given IV hydration and aspirin. Anticoagulation or thrombolysis was not considered because of the large size of the infarct. An ultrasound guided ascitic tap was done for abdominal ascites. The drainage of ascites by paracentesis and self-transfusion of fluid is a good therapeutic option in patients with severe OHSS.\(^5\)

Cerebrovascular complications are by far the most serious side effect of OHSS.\(^7\) Cases have been reported in literature\(^7,8\) that resulted in severe cerebral infarcts secondary to in-vitro fertilization. Rarely, fatal cerebral infarcts involving in-vitro fertilization have also been reported.\(^9\) To our knowledge this is the first such case in Pakistan.

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**References**

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Researchers are still trying to determine the best treatment of depression has been explored while it is yet not clear how TMS may help relieve symptoms of depression.

This procedure is invasive in the sense that anaesthesia and muscle relaxants are used which could have their potential side effects. Transcranial Magnetic Stimulation (TMS) was first developed in 1985 and being used by few centers around the world. Its public use in Pakistan is largely unknown though there are some anecdotal reports of its use in one or two centers. It is a technique of gently stimulating the brain utilizing a specialized electromagnet placed on the patient's scalp that generates focused magnetic pulses. It reduces brain activations and stimulates at higher frequencies. It is used for patients with major depression of refractory nature and its use in other psychiatric and neurologic disorder is being investigated.

FDA has yet not approved TMS for any psychiatric treatment at the present time. In Canada, it has been approved for treatment of depression among patients who have not responded to medications. The researchers are focusing their interest because of its unique features like: being non-invasive, can easily be focused on small areas of brain and can change brain activity. Historically, the therapeutic potential of TMS was not realized until the repetitive stimulator (rTMS) which can generate up to 30 pulses per second was available in 1990s. The side effects of rTMS include mild headache which responds to mild analgesics, and potential hearing damage, which can be prevented with ear plugs. It appears that the long term side effects are unlikely. Its role in treatment of depression has been explored while it is yet not clear how TMS may help relieve symptoms of depression. Networks of brain regions are thought to play a role in mood regulation. Researchers are still trying to determine the best dosage stimulation and the best are to stimulate. The National Institute for Health and Clinical Excellence (NICE) in their guidance mentions "current evidence suggests that there are no major safety concerns associated with TMS for severe depression. There is uncertainty about the procedure's clinical efficacy, which may depend on higher intensity, greater frequency, bilateral application and/or longer treatment durations that have appeared in the evidence to date. TMS should therefore be performed only in research studies designed to investigate these factors." The TMS was found equally effective as ECT in population with depression but no psychosis. In terms of cost, a study concludes that ECT is more cost-effective than rTMS in the treatment of depression. Regarding its comparative efficacy, Eranti S et al had mentioned that rTMS was not as effective as ECT; a rebuttal in the form of correspondence by Janicak et al had raised concerns about limitations of the study in question and indicated that it was premature to conclude that ECT was more effective in non psychotic patients with depression. They suggested a need for large, randomized trial in ECT-naïve patients that also examines potential predictors of response. It has been demonstrated that rTMS has, compared to unilateral ECT no adverse memory effects. A novel form of treatment called magnetic seizure treatment (MST) in which stimulation parameters are reached that can reliably and reproducibly induce therapeutic seizures in the same setting as the one used for ECT has been developed. A recent trial comparing ECT with MST demonstrates fast recovery of orientation and superiority over ECT on measures of attention, retrograde amnesia and category fluency. With the ongoing research on TMS, so far it has been said that its use is divided into two broad categories: diagnostic and therapeutic. For diagnostic purposes, it has a role in stroke, spinal cord injury, multiple sclerosis and motor neuron disease. Plasticity of brain can also be measured now with rTMS as abnormality in

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