

Anterior Myocardial Infarction in Late Pregnancy: A Case Report

Sara Mirzaeian¹, Seyedeh Azam Pourhoseini¹, Mohammad Hossein Sakhaee², Reza Jafarzadeh Esfehiani³

¹ Department of Obstetrics and Gynecology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

² Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

³ Department of Medical Genetics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Received: 03 Jan. 2020; Accepted: 06 Jun. 2020

Abstract- Myocardial infarction (MI) in pregnancy is a rare and critical topic. In time diagnosis and management is mandatory for preventing both mother and fetus from possible mortality and morbidities. Both traditional cardiovascular risk factor and some factors which are present during pregnancy are related to MI during pregnancy. Management of ST-segment elevation MI during pregnancy is almost the same as other women. In the present report, we have discussed a case of anterior ST-segment elevation MI during the late third trimester of pregnancy, which ended up in a successful vaginal delivery. However, in the post-partum period, the patient developed severe bleeding and uterine atony, which was managed medically and with the massage.

© 2020 Tehran University of Medical Sciences. All rights reserved.

Acta Med Iran 2020;58(6):294-296.

Keywords: Pregnancy; Myocardial infarction; Angiography; Post-partum

Introduction

Myocardial infarction (MI) in pregnancy is a relatively rare finding and is seen in of 3 to 10 cases per 100000 deliveries (1). The rate of maternal cardiac death has been increased from 1.01 to 2.31 per 100000 maternities from 1985 to 2008 (2). While pregnancy itself may increase the risk of MI, an increase in mother's age, and the presence of other conventional cardiac risk factors such as hypertension and diabetes will definitely increase the risk (3). Increased parity, eclampsia, preeclampsia, and postpartum infections are some of the mentioned risk factors for MI in a pregnant woman, and the main cause of MI during pregnancy is coronary atherosclerosis following non-atherosclerotic causes (2). While MI in pregnancy is a rare and important topic, there are not enough evidences and guidelines available for management of these patients. In this report we will discuss a case of MI in late pregnancy which was complicated by sever postpartum hemorrhage.

Case Report

A 38-year-old multiparous woman in her 37th weeks of gestation referred to the emergency department because of nausea, vomiting, diaphoresis, and sudden

severe retrosternal chest pain without any radiation. The patient didn't have any history of previous cardiovascular disease but had a history of hypothyroidism. She was addicted to opium and had normal blood glucose and lipid profile. The history of MI was present in the patient's mother at age 50. According to the patient's electrocardiogram, anterior MI was diagnosed, and angiography was scheduled in a well-equipped center in another city. While the only available thrombolytic agent was streptokinase, the patient received 1000000 units of the drug and transferred to Ghaem Hospital, Mashhad, Iran angiography Unit. The patient arrived with stable vital signs and underwent angiography. The angiography result indicated a single vessel disease and ASA (80 mg, single dose), clopidogrel (75 mg, single dose), and heparin (1000 U/hr.) was prescribed. The patient was allowed to have a cesarean section only with spinal anesthesia, and any Valsalva maneuver was prohibited, according to the cardiology consultant. The patient was in a stable condition without chest pain for about 24 hours. On the second day of admission, labor contraction (3 contractions in 10 minutes), as well as 50% effacement and 3cm cervix dilatation, was prominent in physical examination. So, the patient was transferred to the labor ward and gave vaginal birth to a healthy girl under the supervision of both cardiologist

Corresponding Author: S.A. Pourhoseini

Department of Obstetrics and Gynecology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
Tel: +98 5138012477, Fax: +98 5138430569, E-mail address: pourhoseinia@mums.ac.ir

and gynecologist. After the delivery of the placenta, which was intact without any sign of abruption, severe, and active vaginal hemorrhage begun. Two units of pack cell, as well as five units of fresh frozen plasma, were ordered. According to the prescription of the gynecologist, rectal misoprostol (800 mg), as well as 5 mg protamine sulfate and 80 mg oxytocin, were administered. There was not any sign of placenta residue or uterine rupture, and vaginal canal examination was also normal. The bimanual uterine massage was performed because of uterine atony. The patient transferred to the cardiac intensive care unit after one hour of uterine massage, and the bleeding stopped. After 4 hours of transfer, uterine atony accrued again, and the uterine was treated by 90 minutes of massage again. Four hours later, uterine atony developed again, and the uterine massage was performed for 120 minutes, and ten units of oxytocin, as well as 5 units of fresh frozen plasma, was prescribed. Single hand uterine compression was performed for 4 hours, and the bleeding stopped. The patient transferred to the cardiology unit in stable condition (systolic blood pressure: 110 mmHg, diastolic blood pressure: 70 mmHg, pulse rate: 94 bpm, respiratory rate: 24 bpm) with normal urine output and uterine was contracted by the administration of integrin (120 micrograms per hour for one day) and when ejection fraction reached from 30% to 45%. The patient underwent angiography again, and a left anterior descending artery stent was placed according to dissection. Two years follow up the patient and her child were in good

Discussion

Although MI during pregnancy is a rare topic, but it should remain the main concern for both clinicians and nurses in all patients presenting with chest discomfort. In time management is necessary for maintaining myocardial function and achieving a successful delivery (3). An increase in plasma volume, as well as cardiac output during pregnancy, will result in coronary ischemia. These changes are more prominent during the third trimester, and most cases of myocardial infarction are seen in this time period as our case (3). The pathogenesis of MI in pregnancy can be divided according to the patient's age. Women who are younger than 35-year-old are more likely to develop MI because of atherosclerotic causes than nonatherosclerotic causes such as thrombosis or coronary artery spasm (3). This rule was applicable to our patient, which was older than 35-year-old. Damage to the heart and patient clinical

presentation influence from different factors such as the number of involved vessels and branches, presence of collateral vessels, and oxygen demand during and after infarction. In most cases, the presence of prominent angina is an indicator of significant ischemia and cellular death (3).

Diagnosis of MI during pregnancy is as same as MI in non-pregnant patients, which is mostly based on ischemic symptoms such as angina, shortness of breathing, and sweating. Electrocardiography is the cornerstone for the diagnosis of MI in the emergency department as its inexpensive, rapid, and easy to perform (3). Unlike our patients, which was presented with chest pain and sweating, some pregnant women may present with atypical presentations such as dyspnea, indigestion, nausea, vomiting, and epigastric pain. Delayed diagnosis is usually because of these atypical symptoms and low index of suspicion of MI in this group of patients (4). The management of pregnant patients is approximately the same as other patients. Treatment can be initiated by 2-3 lit/min oxygenation, and pain management may be considered by using morphine sulfate. However, neonatal respiratory depression is one of the most important concerns about using morphine sulfate shortly before birth (3). Clopidogrel is a platelet aggregation inhibitor with unknown teratogenicity, which can be given during pregnancy if the benefits outweigh risks (5). Nitrates and anti-arrhythmic drugs are also used despite their effect on systemic blood pressure (3). Although there was not any contraindication for using anti-arrhythmic drugs, however, we decided not to use these drugs because of ongoing hemorrhage and possible risk of further hypotension. Percutaneous coronary intervention (PCI) is the best choice in capable patients. PCI with Stent Implantation is superior to balloon angioplasty (4). If there is not any contraindication for systemic thrombolysis, these medications may also be used during MI. Antiplatelet therapy and antithrombotic therapy are the two main arms of MI treatment (3). Low molecular weight heparin (LMWH) and unfractionated heparin (UFH) effect are easy to reverse and won't cross the placenta. In our patient, we tried to reverse the effect of heparin by using protamine sulfate after delivery. Because of complications of antithrombin therapy, planned labor induction is beneficial for reducing the risk of bleeding. While arrhythmias, myocardial ischemia and maternal death are reported to be associated with bolus doses or infusion of oxytocin; however, induced labor with controlled doses of oxytocin and under careful monitoring of cardiac and

Anterior myocardial infarction in late pregnancy

fluid status is applicable (5). According to possible effects of synthetic prostaglandins such as coronary vasospasm and mentioned effects for oxytocin, some authors prefer spontaneous onset of labor (6). If there is no obstetric indication for cesarean section, vaginal delivery is preferred because of its lower rate of bleeding and thromboembolic events (5). In susceptible patients, it is reasonable to delay delivery because of increase mortality rate in 2-3 weeks after infarction (2).

Antithrombotic therapy in pregnant women is always considered a risky choice as there is not enough evidence available for the safety of these drugs. However, in patients who are in their late stages of pregnancy, there is not any worry about the teratogenicity of such medications. Although the placenta drug delivery will still be the main concern, possible maternal complications are the other issue (7). While most of the deliveries were uneventful, hemorrhagic events, as same as our case, are the most common complication of thrombolytic agent use (7).

Although MI in pregnancy is a rare clinical condition, the physician and nurses should always keep in mind that there could be even more important reasons for pregnant women complications. Performing an electrocardiogram in each pregnant woman with traditional risk factors of cardiovascular disease presented with retrosternal chest pain along with checking for other gastrointestinal problems seems necessary. Although PCI is the best way of managing acute MI, however thrombolytic agents such as

streptokinase may be useful when coronary interventions are unavailable.

References

1. James AH, Jamison MG, Biswas MS, Brancazio LR, Swamy GK, Myers ER. Acute myocardial infarction in pregnancy: a United States population-based study. *Circulation* 2006;113:1564-71.
2. Wuntakal R, Shetty N, Ioannou E, Sharma S, Kurian J. Myocardial infarction and pregnancy. *Obstet Gynaecol* 2013;15:247-55.
3. Kennedy BB, Baird SM. Acute Myocardial Infarction in Pregnancy. *J Perinat Neonatal Nurs* 2016;30:13-24.
4. Pacheco LD, Saade GR, Hankins GD. Acute myocardial infarction during pregnancy. *Clin Obstet Gynecol* 2014;57:835-43.
5. Ismail S, Wong C, Rajan P, Vidovich MI. ST-elevation acute myocardial infarction in pregnancy: 2016 update. *Clin Cardiol* 2017;40:399-406.
6. Regitz-Zagrosek V, Blomstrom Lundqvist C, Borghi C, Cifkova R, Ferreira R, Foidart JM, et al. ESC Guidelines on the management of cardiovascular diseases during pregnancy: the Task Force on the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC). *Eur Heart J* 2011;32:3147-97.
7. Gartman EJ. The use of thrombolytic therapy in pregnancy. *Obstet Med* 2013;6:105-11.