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Pregnancy related acute myocardial infarction: Current trends in treatment and future prospects

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Abstract

Acute myocardial infarction in pregnant women is an uncommon but potentially devastating complication with significantly increased rates of maternal and perinatal morbidity and mortality. The treatment of acute coronary syndrome in pregnancy is a unique clinical challenge. Published data on the use of thrombolytic drugs, percutaneous coronary intervention, coronary artery bypass grafting and optimal medical management of ischemic heart disease in pregnancy are limited. This article attempts to review acute myocardial infarction in pregnancy, regarding the basic treatment principles, the timely and correct application of which can yield the best possible result for the mother and the fetus and the newborn.

Keywords: Medication; Thrombolysis; Percutaneous Coronary Intervention; Coronary Atrery Bapyss Grafting

1. Introduction

Pregnancy-related heart disease is a major threat to both the safe outcome of pregnancy and childbirth, as well as for the long-term cardiovascular health of these women [1]. The acute myocardial infarction is characterized by the sudden obstruction of a coronary artery caused by the rapid creation of a thrombus on an atherosclerotic plaque and is triggered by the random rupture of its capsule. The abolition of coronary circulation and the consequent lack of oxygen supply to the corresponding part of the myocardium cause scar-forming necrosis, which then cause a disturbance to the functional ability of the heart, simply maintaining the anatomical integrity of the left ventricle [2].

The risk of acute myocardial infarction, although young in young women of childbearing age during pregnancy, due to the normal changes that characterize it, including blood hypertension, the risk increases significantly [3]. However, despite the increasing incidence of the disease observed in recent years during pregnancy and immediate postpartum period, acute myocardial infarction in pregnant women is an unusual but potentially destructive complication, with significantly increased rates and mortality [4]. Pregnancy associated acute myocardial infarction occurs at a frequency of approximately 0.06 to 10 cases per 100,000 births worldwide [5]. It is estimated that, although the risk of acute coronary episodes is significantly increased with age, pregnancy-related acute myocardial infarction is a multifactorial disease resulting from various predisposing factors and is only partially attributed to the older age [6,7].

In general, the risk factors that favor the occurrence of coronary heart disease cause endothelial damage to the level of coronary vessels, through which the inner vascular jacket of the circulators of inflammatory cells are entitled together with the low-fat lipoprotein particles. The macrophages then consume oxidized lipoprotein and, as the inflammatory

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process is converted into foam cells, the fat strip creates, with the ultimate result of the formation of atherosclerotic plaque, which is completed by the formation of the fibrous capsule and smooth. Atherosclerotic plaques with thin fibrous cover and specific composition features are the fragile and so-called "vulnerable" plates, the rupture of which leads to platelet concentration in the area and the formation of thrombus in one or more coronary arteries, and the challenge is very likely to the point. The end result is the sudden and critical decrease in blood flow to the heart region which causes other degree acute myocardial ischemia and the manifestation of acute coronary syndrome. In the case of myocardial infarction, necrosis of cardiomyocytes causes a strong local inflammatory reaction and scarring within a few weeks [8,9].

This article based on recent literature attempts to review myocardial infarction into pregnancy, mainly with the basic principles of dealing with these pregnant women, the timely and proper application of which can produce the best possible result for the mother and the fetus - newborn. However, it is emphasized that as the bibliography available for the management of these pregnant women remains limited to date, the immediate therapeutic approach of the pregnancy -related myocardial infarction is mainly based on recommendations and guidelines derived from non-pregnant women.

2. Management

The treatment of acute coronary syndrome during pregnancy is a unique clinical challenge (Table 1). In order to effectively manage and ensure the optimal care of the pregnant woman with acute myocardial infarction, close collaboration between obstetricians - gynecologists, cardiologists, neonatologists and anesthesiologists is considered essential for both pregnant and pregnant women. Ideally the pregnant woman is best to be hospitalized in an intensive care unit and drawing a plan for the emergency delivery of a potentially viable fetus in the event of a sudden deterioration of her condition [10]. Despite the significant diagnostic and therapeutic improvements achieved in recent years, acute pregnancy -related myocardial infarction often has an unfavorable outcome, as emergency treatment is difficult due to significant restrictions on ionizing radiation during coronary article, which is potentially harmful to the fetus even at low doses [11].

Table 1 Therapeutic approach to the pregnancy -related acute myocardial infarction

1.	**Medication**
	Morphine
	Nitroglycerin
	Acetyls -album acid
	B - receptors inhibitors
	Anticoagulants
2.	**Thrombolysis**
3.	**Percutaneous Coronary Intervention**
4.	**Coronary Atrery Bapyss Grafting**
5.	**Timing of Labor**
6.	**Way of Labor**

2.1. Medication

The most appropriate medication for pregnant patients with ischemic heart disease or acute myocardial infarction remains unknown, although it should not generally differ with some mildly disclosures from the acute coronary syndrome guidelines [12]. Low doses of aspirin inhibit thromboxane synthesis and act protective-antiplatelet, while high doses have been associated with fetal complications, such as perinatal mortality, delayed fetal development, premature and premature convergence. It is estimated that the full dose of aspirin (325 mg) can be used up to the 32nd week, while aspirin in low doses (80 mg) can be safely used throughout pregnancy [13,14]. Metoprolol is preferred by B-inhibitors during pregnancy. Angiotensin converting enzyme inhibitors and angiotensin receptors should be avoided in pregnant women. Similarly, statins administration should be avoided during pregnancy contraindicated [14].

Also, few are known today for the safety of other antiplatelet agents in pregnancy, including clopidogrel and ticopidine. Clopidogrel, although still the most widely used thenopyridin during pregnancy, despite cases of cases have shown a correlation between the use of the clopidogrel of maternal thrombocytia, maternal bleeding and fetal loss [15]. Current guidelines do not provide several recommendations on adapting the double antiplatelet treatment to pregnant women. Also, the data from the use of Ticagrelor in human pregnancy is almost non-existent. It refers to the bibliography incident of a myocardial-related myocardial infarction that was successfully treated with Ticagrelor before and after the primary transdermal coronary intervention with stent implantation, but also the only case of a pregnant woman who was successfully treated by the use of a bridging anti -staircase with Tirofiban anti-staircase. Ticagrelor, in order to make the Caesarean section [16].

2.2. Thrombolysis

Clinical experience with thrombolytic therapy in pregnancy is limited. The data so far are based on reports or series of cases rather than clinical trials. The risks and benefits to the mother and the fetus must be weighed, but in any case intravenous thrombolysis should not be considered an absolute contraindication even at the beginning of pregnancy [17]. In general, the use of thrombolytic factors in pregnancy today is estimated to be associated with a relatively low rate of complications, which in any case must be offset by the risk of serious clinical conditions, including acute myocardial infarction [18]. In addition to the relatively high mortality associated with these conditions, other indications for the therapeutic selection of thrombolysis against surgical treatment (transdermal coronary intervention and aortic bypass surgery) are not clear in the majority of reports. It is estimated that the increased risk of bleeding, increased maternal mortality, increased risk of premature childbirth and fetal loss are complications of thrombolytic therapy that have clearly been described in the literature [19]. On the basis of the scientific data to date, there is no consent of researchers who have particularly dealt with the subject regarding the optimal management of pregnant women with acute myocardial infarction and thrombolytic treatment. Various attempts to deal with the condition have been described in numerous cases of incidents using intraceanic thrombolysis, suction catheter and stent placement with a variety of success [20].

2.3. Percutaneous Coronary Intervention

Percutaneous Coronary Intervention (PCI) has been well documented in recent years [21]. In any case, however, the reduced risk of bleeding observed after transdermal coronary intervention against thrombolysis must be offset by the risk of ionizing radiation for the fetus. It is a given that the use of radiation required by the method of executing the method can cause concern, both to the healthcare professional and the pregnant woman and affect decisions on the execution of transdermal coronary intervention. Pregnancy should not be a contraindication to transdermal coronary intervention, but on the contrary, as a lifesaving procedure it should be performed when necessary. Management should be determined by an interdisciplinary team consisting of cardiologists, obstetricians, anesthesiologists and neonatalists, and patients should be hospitalized in an intensive care unit that can provide meticulous mother care and obstetric care. It is estimated that the best time to take place is after the fourth month during the second quarter, after the fetal organogenesis is completed, while allowing a longer distance between the fetus and the chest than in the last months of pregnancy. The external armor of the abdomen is a common practice applied to pregnant women to avoid fetal exposure to radiation, but its value may be limited as the dose absorbed by the fetus is the result of internal dispersion rather than direct radiation of the fetus [22,23].

2.4. Coronary AtreryBapyss Grafting

Surgical revolution with Coronary AtreryBapyss Grafting (CABG) in pregnancy is rarely recommended, as percutaneous coronary intervention is rarely recommended to treat most pregnant women with acute ischemic heart disease. However, transdermal coronary intervention is associated with a low success rate and high likelihood of complications and often requires coronary artery bypass surgery. The main indication seems to be the automatic spasm of the coronary vessels, since transdermal coronary intervention in these patients is associated with a low success rate and a high likelihood of complications [24]. Although hundreds of cases of cardiopulmonary bypass have been mentioned in the bibliography to date since it was first used during pregnancy in 1959, aortic bypass surgery after pregnancy after myocardial infarction is still a challenge in daily clinical practice. Based on the latest bibliographic data, it is estimated that cardiac surgery is inherently dangerous for both the mother and the fetus with mortality rates close to 10% and 30%, respectively [25]. Congenital malformations are estimated to occur more frequently in those cases where the procedure is performed during the first trimester of pregnancy [26]. About the long -term results and the management of anesthesia in combination of caesarean section and surgery in pregnancy, the information available is few and do not allow the export of safe results [27].

2.5. Timing and Way of Labor

Finally, the main purpose of its case of myocardial infarction should be to postpone childbirth, if possible, for two to three weeks, as increased hemodynamic requirements during childbirth increase myocardial demand, risk of ischemia and maternal mortality [28]. The type of childbirth chosen depends primarily on the hemodynamic state of the pregnant woman. Vaginal childbirth is associated with less blood loss and a lower risk of infection, while caesarean section may be associated with an increased risk of ventilation and thromboembolic disease. Caesarean section under regional anesthesia appears to be preferred in the case of severe heart disease, such as severe aortic stenosis and pulmonary arterial hypertension in order to avoid prolonged hemodynamic pressures associated with vaginal childbirth and in any case. Early childbirth release may have a viable fetus, always compensating for the risk of prematureness with the risk of maternal and fetal complications from the continuation of pregnancy [28]. The use of oxytocin and ergonomic derivatives should be avoided in order to minimize the risk of coronary vessel spasm [29].

3. Conclusion

Acute coronary syndrome during pregnancy, including myocardial infarction is a rare non -obstetric, but potentially life-threatening complication, with significantly increased rates of parent and perinatal morbidity and mortality. Early diagnosis and treatment is vital. The good and complete scientific training of the group of doctors who will be called upon to manage this emergency is necessary in order to avoid deteriorating underlying disease and to ensure the smoother outcome of pregnancy. It is necessary today all healthcare professionals, and especially those of the Emergency Department, as well as the healthcare personnel of the maternity hospital to be able to recognize the predisposing risk factors and signs - symptoms of the disease so that timely treatment can ensure the best A powerful result for both the mother's health and the health of the fetus and the newborn.

Comp with ethical standards

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Disclosure of conflict of interest

The authors declare no competing interests.

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