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Özet

Bu olgu sunumunun amacı, iyi nörolojik sağ kalım için efektif resüsitasyon ve terapötik hipoterminin önemini hatırlatmaktır. Kırk yaşında bilinçi kapalı bayan hasta acil servise getirildi ve ventriküler taşikardi (VT) arrest nedeniyle resüsite edildi. Spontan sirkülasyonun geri dönmesinden sonra hipotermik resüsitasyona başlandı. Soğutma işlemi için kapalı multi balo kateter içerisinden soğuk salin geçirilerek yapıldı. 24 saat sonra hasta aynı yöntemle ısıtıldı. Hasta 2 ayın sonunda iyi nörolojik sağkalım ile taburcu edildi. Hipotermik resüsitasyon spontan sirkülasyonu geri dönen komatöz hastalarda iyi nörolojik sağkalım için önemlidir. Acil tıp uzmanları hipotermik resüsitasyon hakkında eğitilmeli ve gerekli ekipmanlar acil serviste bulundurulmalıdır.

Anahtar kelimeler: *Kardiyak arrest, Terapötik hipotermi Resüsitasyon*

Abstract

The aim of this case report is to remind the importance of effective resuscitation and therapeutic hypothermia for good neurological outcome. Case: A 40 year-old unconscious female patient was brought to emergency service and resuscitated because of VT arrest. After return of spontaneous circulation started for hypothermic resuscitation. For cooling process cold saline was circulated via closed-loop multi balloon catheter. Patient reheated by the same method after 24 hours. After two months patient discharged with good neurological outcome. Conclusion: Hypothermic resuscitation is important for better neurological outcome after ROSC of comatose patient. Essential equipments must be provided in emergency services and emergency physicians should be trained about hypothermic resuscitation.

Keywords: *Cardiac arrest, Therapeutic hypothermia Resuscitation*

Introduction

Management of cardiopulmonary arrest is one of the most important subjects of emergency education. Return of spontaneous circulation (ROSC) and minimum neurological damage are the primary goals of the emergency physicians. Brain damage and cardiac instability are the major indicators of the survival of cardiac arrest patients [1,2]. American Heart Association (AHA) and European Resuscitation Committee recommends therapeutic hypothermia for good neurological outcome to comatose cardiac arrest patients after ROSC [3]. The aim of this case report is to remind the importance of effective resuscitation and therapeutic hypothermia for good neurological outcome.

Case Report

A 40 year-old unconscious female patient was brought to emergency service by her relatives. Chest compression was started immediately to the pulseless patient and endotracheal intubation was performed. It was learned that

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she was unresponsive for 10 minutes and first suffered from dyspnea. First rhythm detected on monitor was ventricular tachycardia and defibrillation was performed at 200 Joule biphazic. After a 45-minute cardiopulmonary resuscitation (CPR), patient's spontaneous circulation was provided and then angiography was performed. There was no coronary artery occlusion but dilated cardiomyopathy.

In intensive care unit (ICU) cooling process of mechanically ventilated patient was started for hypothermic resuscitation four hours after ROCS. A central catheter was inserted through the femoral artery and sodium thiopental was administered to patient before cooling process was started. ZOLL Thermogard XP Temperature Management System, Alsius USA machine/device was used in cooling process. Cold saline was circulated via closed-loop multi balloon catheter and core temperature decreased until 32°C (Figure 1). Patient reheated by the same machine and method after 24 hours.

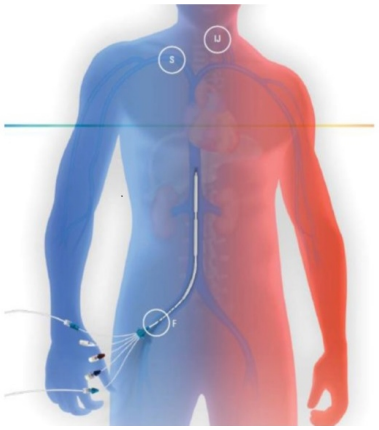

Figure 1
Closed-loop multi balloon catheter (ZOLL thermogard XP Temperature Management System, Alsius USA)

Mechanically ventilator support was stopped after 15 days. Patient was operated because of the pseudo-aneurysm which was occurred during angiography and discharged with good neurological outcome after two months.

Discussion

Therapeutic hypothermia was first used in 1943 for the neurological damaged patients. Severe traumatic brain injury patients who were cooled to 32-34 °C have showed better survival rate and better neurological outcome [4,5]. However some clinical researches recommend therapeutic hypothermia for cardiac arrest patients after ROSC [3].

Modell et al [6] reported a case which a 2-year-old patient was drowned and stayed 20 minutes under water. CPR was performed over 1 hour to drowned boy whose rectal body temperature was 26.7 ºC and Glasgow Coma Score was 3. After 72 hours, patient discharged with intact neurological status. Comparison between standard care and additive therapeutic hypothermia in effectively resuscitated cardiac arrest patients shows that patients who take therapeutic hypothermia group has better outcomes. Accordingly, in VF related cardiac arrest patients who were treated by therapeutic hypothermia showed better neurological outcomes than normothermic patients [7].

In the first six hours of cardiac arrest, decreasing body temperature under 33 ºC and preserve this level for 12-24 hours can inhibit neurotransmitters (especially glutamine and dopamine) which are responsible for tissue injury [8]. This situation maintains the integrity of blood brain barrier, protect ATP storage pool, helps to decrease intracranial pressure and minimize brain injury [9]. AHA also recommends decreasing body temperature to 32-34 °C over 12-24 hour to adult VF cardiac arrest related adult ROSC comatose patient (Class I, LOE B). Induced

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therapeutic hypothermia may be considered to comatose patient after ROSC at initial rhythm in hospital cardiac arrest and initial rhythm of pulseless electrical activity or asistol out of hospital cardiac arrest (Class IIb, LOE B) [2].

In our case, pulseless VT related cardiac arrest patient's ROSC was occurred and hypothermic resuscitation was performed within 6 hours. Patient discharged with good neurological outcome.

Non-invasive (cold helmet, cold blanket, cold peds, ice packs,cold water) and invasive (intracerebral hypothermia, cooling blood with extracorporal circulation, cardiopulmonary bypass, endovascular cooling, cold ringer lactate, cold saline, peritoneal lavage with cold liquid, nasal, nasogastric and rectal lavage, nasopharyngeal balloon catheter, retrograde jugular vein flushing) techniques can be used for hypothermia induction [3]. External cooling techniques need carefully follow up and much more effort. Cardiovascular adverse effects and pulmonary edema can be seen in cold liquid infusion. None of these techniques regarded as an optimal [2]. In our case, endovascular catheter was used for hypothermic resuscitation and any complication was not recorded.

Conclusion

The best technique in cardiac arrest patient is still effective cardiac massage and defibrillation in suitable rhythm. Hypothermic resuscitation is important for better neurological outcome after ROSC of comatose patient. Essential equipments must be provided in emergency services and emergency physicians should be trained about hypothermic resuscitation. Hypothermic resuscitation should be started immediately for proper patients.

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