



Hyperkalemic Cardiac Arrest Reversed By Prolong CPR and Transcutaneous Pacing

KEYWORDS

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ABSTRACT We report a case of 70year old male who presented with 3 days history of fever and acute dyspnea and during treatment he developed cardiac arrest due to asystole . On further evaluation cause for the cardiac arrest was found to have acute renal failure with hyperkalemia . With prolong cardiopulmonary resuscitation ,transcutaneous pacing and anti hyperkalemic measures the patient fully recovered .

BACKGROUND

Urinary tract infection with acute renal failure is a common problem in india¹. Sometime the renal failure complicate with hyperkalemia and if severe it can leads to asystolic variety of cardiac arrest².The treatment options include cardiopulmonary resuscitation and antihyperkalemic measures like salbutamol inhalation, insulin glucose and bicarbonate administartion.As asystole is a serious condition and mortality is very high sometimes additional measures like pacing is necessary.In this article we report a patient with hyperkalemic cardiac arrest who recovered with prolong cardiopulmonary resuscitation and transcutaneous pacing.

This report is intended to increase awareness of proper evaluation of hyperkalemia and prompt decision for pacing in appropriate cases.

CASE PRESENTATION

A 70yr old male was brought to the casualty with complaints of Fever for 3days, Sudden onset of breathlessness for 3 hours.The fever was continous associated with chills and rig-or and burning micturition. Past history , Family history and Personal history – nothing significant.

On examination

Patient drowsy , Pulse-36bpm, BP – 100/60 mm Hg , Respiratory rate30 cycles/min, Temperature 100 degree farenhit ,Pupils - Bil. Equal and reacting , Plantar-Bilateral flexor.

While examining, pt. suddenly deteriorated. At that point of time Pulse-not palpable , BP- not recordable , Cardiac monitor showed asystole. CPR was started as per ACLS protocol. After about 20 minutes monitor showed sinus rythm CPR was stopped . But monitor again showed asystole after 15min . So CPR was started again . At this point of time Cardiologist consultation was sought for transcutaneous pacing and was done after 45 minutes of CPR . After pacing the rhythm becomes normal and CPR was stopped.

Investigations : Hb-11.2% ,TLC-19700 cells/cu.mm ,DC - N 78, L 20, E 1 , GRBS- 190 mg/dl B.UREA-85mg/dl,S.creatinine-3.6mg/dl , S.sodium-129meq/l , S.potassium-8.6meq/l , Urine pus cells-plenty , ABG suggestive of metabolic acidosis The final diagnosis was Urinary tract infection,acute renal failure ,hyperkalemia with asystole.

He was treated for hyperkalemia With 10ml of 10%calcium gluconate over 5min. , 25%dextrose with 10 units of insulin. , Salbutamol nebulization 6 hourly , Inj sodium bicarbonate 50ml over one hour , K bind sachet 6th hourly , Inj cefoperazone 1gm 12 hourly . After 2hrs , Potassium was 5.5meq/l . This treatment was continued on day1

Day2 : Serum k+ was 5meq/l , Pulse-100/min pacemaker rhythm , Bp- 110/72 mmHg ,

Transcutaneous pacing continued , Salbutamol inhalation continued , K bind sachet was Continued.

Day3 . Patientt became conscious and oriented , Serum potassium-3.5meq/l S.creatinine-

2.7mg/dl , Antibiotics and other supportive measures were continued , Pacemaker was removed

Day4 . S.creatinine-2.2meq/l , S.potassium-3.5meq/l , Same treatment was continued for next three days

Day 7. Pt conscious and coherent , S.potassium-3.6meq/l , S.creatinine-1.2mg/dl , TLC-8000cells/cu.mm , Pt was discharged

DISCUSSION

Acute renal failure with hyperkalemia is a life-threatening condition .

Hyperkalemia can cause a marked decrease in myocardial contractility and cardiac conduction defects³ . It is important to recognize the rise in serum potassium in acute renal failure because

if it rises above 8 , it can leads to ventricular fibrillation or asystole²

The treatment of hyperkalemia consists of antagonizing the effects on the myocardium, shifting potassium into the intracellular space and removing it. Insulin and salbutamol effectively promote potassium cellular uptake within 30 minutes and last 4-6 hours, and thus acutely decrease the plasma potassium level. Bicarbonate administration is probably less effective than insulin and beta-agonists and the earliest decrease in plasma potassium occurs 4 hours later. However, substantial effects may still be exerted in patients exhibiting-significant metabolic acidosis.^{4,5,6,7} Our patient responded well to all hyperkalemic measures but as the minimum time to respond all these medications requires 30 minutes the patient developed asystole within first half an hour of therapy

Asystole is the absence of electrical activity in the myocardium .Asystole can be primary or secondary.

Primary causes are asystole-due to intrinsic heart disease. Secondary causes are

Hypoxia , Hyperkalemia , Hypokalemia , Hypothermia , Aci-

dosis, Drug Overdose⁸, Asystole is associated with a poor outcome regardless of its initial cause. In the Goteborg study, out of 1,635 asystolic patients 10% survived to hospital admission 2% survived to hospital discharge⁹

In another study of 185 asystole patients, 9% had survived to hospital admission and none were Discharged¹⁰.

The treatment of asystole started with Confirm of asystole in more than one lead, Continue CPR

Intubation at once, To obtain IV access then Epinephrine 1mg IV push, repeat every 3-5 minutes followed by atropine 1 mg IV, repeat every 3-5 min up to a total of 0.03-0.04 mg/kg and lastly consider immediate transcutaneous pacing (TCP).

Transcutaneous pacing (also called external pacing) is a temporary means of pacing a patient's heart during a medical

emergency. It is accomplished by delivering pulses of electric current through the patient's chest, which stimulates the heart to contract. In a study of 30 asystolic patients 4 patients improved with pacing but nobody was discharged alive.¹¹ In another study among 112 asystolic patients only 2 percent recovered.¹² In our case the patient survived probably due to reversibility of the disease and immediate pacing.

CONCLUSION

In conclusion we reported a case having hyperkalemic asystole who recovered completely with prolong cpr and transcutaneous pacing. Though asystole has a bad prognosis, the patients who do not have end stage heart disease and a reversible cause for hyperkalemia is present, the prompt treatment with transcutaneous pacing may improve the survival. We therefore suggest that early transcutaneous pacing along with cpr is an effective method to treat the hyperkalemic asystole.

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