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Letter to the Editor

Reversible causes of cardiac arrest 4 "Ts" and 4 "Hs" can be easily diagnosed and remembered following general ABC rule, Motol University Hospital approach

Dear editor,

European Guidelines for cardiopulmonary resuscitation (CPR) recommend treating reversible causes of cardiac arrest during CPR [1]. However, in practice while performing CPR often in stressful situations, it is difficult to remember all 4 "Ts" and 4 "Hs" causes (hypoxia, hypokalaemia/hyperkalaemia, hypothermia/hyperthermia, hypovolaemia, tension pneumothorax, tamponade, thrombosis, toxins), especially for medical students, young doctors and doctors not experienced in CPR.

We would like to provide an approach used in our hospital for teaching and performing CPR. This approach helps to easily remember and make the diagnosis of 4 "Ts" and 4 "Hs", just according to the general ABC rule:

1. **A–secure airway** (*hypoxia* is treated by artificial ventilation)
2. **B–secure breathing** symmetrical on both sides of thorax (*tension pneumothorax* must be treated)
3. **C–secure circulation–** point of care echocardiography plays critical role in diagnosis:
   a *hypovolemia* – represented by small/collapsed inferior vena cava and "empty" heart (end diastolic diameter of left ventricle below 35 mm)
   b *pulmonary embolism* – represented by dilated right ventricle, which is bigger then left ventricle
   c *thrombosis of coronary artery* – represented by hypokinetic left ventricle/fibrillation
   d *tamponade* – represented by fluid in the pericardium compressing the heart

Those six causes can be treated during CPR without established intravenous access.

4 **Check for two metabolic causes**, which can be diagnosed only after blood sample is obtained and analysed for:
   a kalaemia (*hyperkalaemia/hypokalaemia*)
   b hydrogen ion (*acidosis*)
5 **Check for two relatively rare causes**, which require specific treatment:
   a *hypothermia/hyperthermia*
   b *toxicity*

This approach in diagnostic process of cardiac arrest is much fancied among our medical staff and we believe that it can also help other doctors during CPR scenario.

Conflict of interest

None.

References

[1] Truhlar A, Deakin CD, Soar J, et al. European resuscitation council guidelines for resuscitation 2015 section 4 cardiac arrest in special circumstances. Resuscitation 2015;95:147–200.

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