Cardiopulmonary resuscitation for sudden cardiac arrest on the field of play: improving our standard!

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Sudden cardiac arrest (SCA) on the field of play (FoP) is a life-threatening event which requires a prompt and coordinated medical response.[1] Guidelines for implementation of an emergency medical plan (EMP) for SCA have been previously outlined by the FIFA[2] and UEFA,[3] but the best available evidence to respond to the unique circumstances of the football athlete with SCA on the FoP continues to evolve.

Prompt recognition of SCA is the first step in an efficient EMP (figure 1). SCA should be considered in any player who presents with a non-contact collapse, recognising that brief myoclonic seizure-like activity (eg, shaking, quivering or twitching) may follow collapse and that continued chest and abdominal movements or gasps may be mistaken for normal breathing.[2]

IMMEDIATE RESPONSE: CHEST COMPRESSIONS AND DEFIBRILLATION

Once SCA is suspected, a prompt response is immediately required by two members of the medical team ideally proficient in advanced life support, including the pitchside doctor, which should enter the FoP immediately with an external defibrillator and a medical bag.[2 3] Once SCA is confirmed, cardiopulmonary resuscitation (CPR) should be initiated and rhythm checked using self-adhesive pads with administration of a first shock if indicated as soon as possible within the first 2 min of collapse.[4–6] We recommend compression-only CPR during the first 2–4 min of resuscitation because during this low blood flow state, oxygen delivery to the heart and brain is limited by blood flow rather than by arterial oxygen content.[6] Therefore, chest compressions are more important than rescue breaths which could reduce efficacy due to interruption in chest compressions and the increase in intrathoracic pressure that accompanies positive-pressure ventilation.[4–6] After shock delivery, high-quality CPR should be immediately resumed with a compression rate of 100–120/min and compression depth of at least 5 cm.[4 5] Importantly, CPR is an aerosol-generating procedure and proper personal protective equipment is recommended during the COVID-19 pandemic.[7]

VIDEO REVIEW

Ideally, in official games, a third member of the medical team (trained in the recognition of SCA in athletes) should have real-time access to an on-field review of video replays from different camera angles to further inform care and decision-making about the collapse. This medical video review platform has already been used for the analysis of head collisions at some UEFA competitions and is a standard practice at FIFA events.[2] Of course, in the setting of a non-contact collapse and suspected SCA, this video review should not delay the on-field assessment and immediate resuscitation. Details from the video analysis can be promptly communicated with the on-field responders via radio or direct exchange.

ADVANCED RESUSCITATION MEASURES AND TRANSFER

A preappointed off-field medical team member is also responsible to activate transport to a predetermined cardiac arrest centre (CAC). If return of spontaneous circulation (ROSC) is obtained at any time point, the athlete should be transferred to the nearest CAC—with 24/7 availability of an on-site coronary angiography laboratory, imaging facilities and an intensive care unit with targeted temperature management capacity—for postresuscitation care.[4 5] However, if ROSC is not obtained after the first or second shock, standard protocols should be followed, including administration of drugs (epinephrine and amiodarone) and advanced airway procedures (laryngeal mask airway or tracheal intubation).[4 5] These procedures aim to simultaneously optimise coronary/cerebral perfusion, which directly influence both ROSC and neurological outcome, and prepare the patient to an eventual FoP extraction. If after three shocks and high-quality CPR

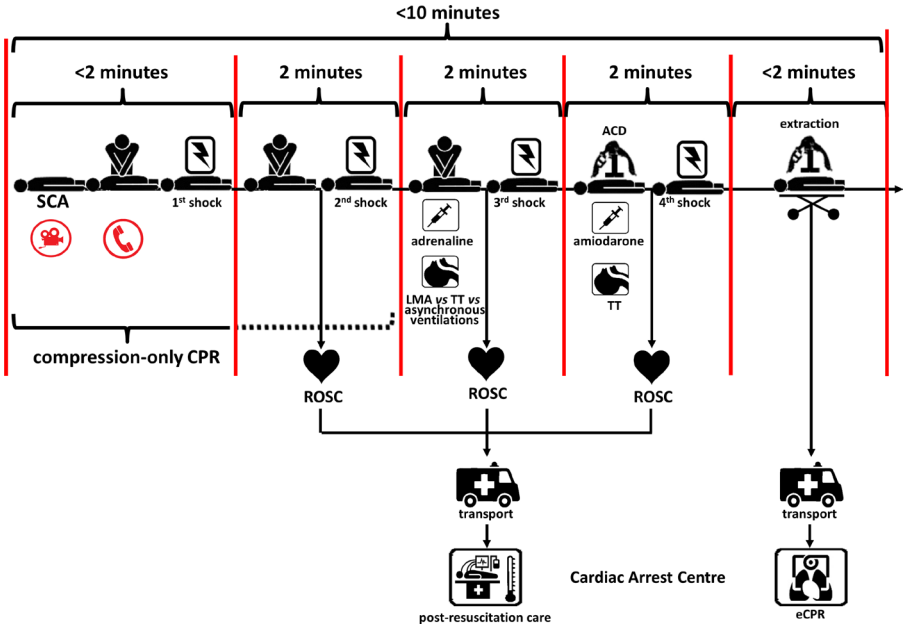

Figure 1 Emergency medical plan for SCA on the field of play. ACD, automatic chest compression device; CPR, cardiopulmonary resuscitation; eCPR, extracorporeal cardiopulmonary resuscitation; LMA, laryngeal mask airway; SCA, sudden cardiac arrest; ROSC, return of spontaneous circulation; TT, tracheal tube.

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sustained ROSC is not achievable, the best evidence supports rapid transfer (time shorter than 30 min) if possible to a CAC with extracorporeal cardiopulmonary resuscitation (eCPR) ability and rapid deployment of venoarterial extracorporeal membrane oxygenation.[8] For FoP extraction, the use of automatic chest compression devices (ACDs) is recommended to support the transport by ambulance or rescue helicopter.[9] While such technology and systems are still not widely available, especially on a 30 min timescale, we propose this benchmark and encourage every effort be made to offer this level of care to SCA victims on the FoP.

REVIEW AND PRACTICE

The EMP should be site-adapted and rehearsed by proficient medical teams to ensure an efficient response and the best chance of survival. FoP SCA survival is maximised with prompt recognition, provision of high-quality CPR, early access to defibrillation, rapid extraction using ACD and transfer to an adequate (preactivated) CAC for eCPR and/or post-resuscitation care.

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