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Letter to the Editor

Out-of-hospital cardiac arrest in school sports in Japan: Possible next steps

To the Editor,

The recent publication by Kiyohara et al.[1] is an exciting addition to the literature pertaining to out-of-hospital sudden cardiac arrest (SCA) and the utility of immediate cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) implementation. This publication contributes to other data regarding defibrillation in school sports and confirms that the availability of AEDs assists in youth survival from SCA.[2] Additionally, this report found the rate of CPR being used in conjunction with AEDs in youth sport increased from 65.8% to 89%, a reassuring statistic for public defibrillation efforts in saving lives.[1] Recent reviews of SCA in sport have identified a sustained lack of knowledge about SCA risk across various activities and regions,[3] thus this study will provide critical information to fill the gap about youth SCA incidence and survival across many activities.

This paper found that approximately 4.7% of SCA cases in this cohort were due to non-cardiac origins.[1] Unfortunately, the authors did not identify what the specific non-cardiac etiologies of SCA were, possibly due to an inability to obtain that information. There is significant variability in the etiologies of SCA in youth athletes, likely due to ascertainment bias, regional variation, and clinical variation.[4] Therefore, reporting these causes in future research would contribute greatly to the gaps in knowledge of youth SCA origins. Moreover, this study found lower combined CPR and AED use in the non-cardiac originated cases. Commonly stemmed from non-cardiac origins like hypoxia, non-shockable rhythms of SCA, such as asystole, are strongly associated with poor outcomes and require prompt treatment of the underlying etiology.[5] Though defibrillation does not cease the erratic dysrhythmia in this population, AEDs can still be used to monitor changes in rhythm during ongoing resuscitation, allowing providers continuous insight into how to treat the affected patient and in special circumstances where travel to a hospital is unavailable.[6,7] Therefore, it is important to reiterate that though AEDs are not being used as often for non-cardiac origins of SCA, they may still serve an important role in this relatively smaller population to improve outcomes.

Interestingly, this article did not mention the status of an emergency action plan (EAP) at schools, which have been previously recommended in places of sport.[8] Identifying the presence and impact of routine practice to SCA response with regular AED maintenance is critical in prompt treatment to improve outcomes.[8] This includes education and training of staff on site; given over 40% of SCA occurred during physical education class,[1] routine practice of the EAP with teachers or even other students could assist in improving youth survival. Finally, further research could identify possible differences in SCA outcomes between schools and sports stadiums with and without an EAP.

Overall, this article and new data presented by Kiyohara et al.[1] should be applauded for their contributions to our understanding of the chain of survival in sport and filling gaps of knowledge about sporting SCA incidence and outcomes in youth globally, and highlights future directions of research.

CRediT authorship contribution statement

Mario D. Bassi: Conceptualization, Investigation, Visualization, and all Writing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. Kiyohara K, Matsui S, Ayusawa M, et al. Basic life support for non-traumatic out-of-hospital cardiac arrests during school-supervised sports activities in children: A nationwide observational study in Japan. Resuscitation Plus 2024;17, 100531. https://doi.org/10.1016/j.resplu.2023.100531.
2. Drezner JA, Toresdahl BG, Rao AL, Huszti E, Harmon KG. Outcomes from sudden cardiac arrest in US high schools: a 2-year prospective study from the National Registry for AED Use in Sports. Br J Sports Med 2013;47:1179–83. https://doi.org/10.1136/bjsports-2013-092786.

3. Bassi MD, Farina JM, Bombau J, et al. Sudden cardiac arrest in basketball and soccer stadiums, the role of automated external defibrillators: a review. For the BELTRAN Study (BaskEtbaLl and soccer sTadiums: Registry on Automatic exterNal defibrillators). Arrhythm Electrophysiol Rev 2023;12. https://doi.org/10.15420/aer.2022.30.
4. Ackerman M, Atkins DL, Triedman JK. Sudden cardiac death in the young. Circulation 2016;133:1006–26. https://doi.org/10.1161/CIRCULATIONAHA.115.020254.
5. Van den Bempt S, Wauters L, Dewolf P. Pulseless electrical activity: detection of underlying causes in a prehospital setting. Med Princ Pract 2021;30:212–22. https://doi.org/10.1159/000513431.
6. Brown AM, Rittenberger JC, Ammon CM, Harrington S, Guyette FX. In-flight automated external defibrillator use and consultation patterns. Prehosp Emerg Care 2010;14:235–9. https://doi.org/10.3109/10903120903572319.
7. Panchal AR, Bartos JA, Cabanas JG, et al. Part 3: Adult basic and advanced life support: 2020 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation 2020;142(16_suppl_2):S366–468. https://doi.org/10.1161/CIR.0000000000000916.
8. Siebert DM, Drezner JA. Sudden cardiac arrest on the field of play: turning tragedy into a survivable event. Neth Heart J 2018;26:115–9. https://doi.org/10.1007/s12471-018-1084-6.

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