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EDITORIAL COMMENT

Sudden cardiac death in athletes – Addressing the silent threat

Morte súbita cardíaca em desportistas - abordar a ameaça silenciosa

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Sudden cardiac death (SCD) in athletes, although rare, remains one of the most tragic and highly visible events in sports.[1,2] The study on SCD in Portugal by Gonçalves et al.,[3] spanning 20 years, offers crucial insights into the incidence and characteristics of these fatalities, and raises important questions about public health, emergency preparedness, and sports safety. With the advent of rigorous screening protocols and improvements in medical understanding, the global conversation around SCD, particularly in young athletes, has grown significantly in recent years.[4,5] However, as highlighted in this study, the path forward demands more robust data collection systems, greater awareness, and enhanced prevention strategies.

The complexity of SCD incidence in athletes

The incidence of SCD varies widely in international reports, and the reasons for these discrepancies are multifaceted. According to this study, SCD incidence in Portuguese athletes was 0.39 cases per 100 000 per year – lower than many international estimates.[1,2,6–9] Comparatively, studies from the United States and Europe have shown incidences ranging from 0.1 to 13 cases per 100 000 athletes per year. These variations are influenced by differences in methodology, population heterogeneity, and, crucially, also the definition of an ''athlete.'' Should amateur participants be included, or should this label be restricted to elite athletes? The discrepancies extend further to age, sex, and the type of sport, which complicates direct comparisons between different studies.

Furthermore, the methods of case identification significantly impact incidence figures. Media-based studies like this one, while valuable, are inherently prone to underreporting. It is well established that only a fraction of cases, particularly those occurring outside of major events or involving lesser-known athletes, may not be reported in the media. The Italian experience, with an internet-based study,[10] also demonstrated similar challenges, wherein lower SCD incidence rates were attributed to potential underreporting. Therefore, while the Portuguese study provides a snapshot of SCD in Portugal, its results must be interpreted within the broader context of the challenges of data collection in this field.

Risk factors: A clear but incomplete picture

The demographic findings of the Portuguese study align with global trends. SCD overwhelmingly affects male athletes, with 93% of the cases reported in men. This is consistent with research indicating that male athletes face a significantly higher risk of SCD compared to their female counterparts. Additionally, the study found that the majority of these events occurred during competition or training, a fact that underscores the importance of pre-participation screening and the need for proper emergency medical responses at sports venues, specially automated external defibrillators (AEDs).[1,2,11]

Interestingly, soccer (football) was the sport most frequently associated with SCD in Portugal, reflecting similar

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patterns in other European nations. In contrast, basketball has been highlighted as the sport most associated with SCD in the United States.[5,8] These regional differences are likely driven by the popularity of different sports in various countries and the distinct physiological demands they place on the heart.

The role of age as a confounding factor in SCD incidence is another critical area of focus. The median age of athletes in the Portuguese study was 27, with a wide age range of 12–70 years. Older athletes, particularly those over 35 years, are more susceptible to coronary artery disease, a major contributor to SCD in this population.[4] In contrast, younger athletes are more likely to suffer from inherited cardiac conditions or electrical abnormalities.[1,5,7] Identifying at-risk individuals across this spectrum requires not only improved screening programs but also a more precise understanding of the interplay between genetic and acquired risk factors.

Limitations of the study and areas for improvement

The study underscores the limitations of relying on media reports for SCD data. The passive data collection method used in this research, while cost-effective and logistically feasible, inherently misses cases that go unreported in the media. Research from the United States[1,9,11] indicates that media-based studies capture between 56% and 70% of actual cases, while Danish studies suggest it is as low as 20% coverage.[6] This underlines the urgent need for a national registry in Portugal and in other countries to accurately track SCD cases, ensuring a more comprehensive understanding of its true incidence and underlying causes.

Moreover, the lack of access to autopsy reports and death certificates in the Portuguese study precluded a thorough analysis of the exact causes of death. While sudden cardiac arrest cases were not included, it remains critical to distinguish between different forms of cardiac-related death for a more accurate epidemiological profile. Additionally, given the significant advancements in post-mortem genetic testing, molecular autopsies could play a pivotal role in identifying inheritable conditions that contribute to SCD, thus enabling early detection and prevention in at-risk individuals.[1]

A path forward: prevention and preparedness

The findings of this study call for urgent action on several fronts. First, the establishment of a mandatory national registry for SCD in athletes would provide a reliable and comprehensive source of data, filling the gaps left by media-based methods. This registry should be accompanied by standardized protocols for reporting, including detailed demographic, clinical, and circumstantial information for each case.

Second, the implementation of universal pre-participation cardiac screening, including electrocardiograms and possibly, when appropriate, advanced imaging techniques, that could help identify athletes at risk before they engage in competitive sports. While controversial due to cost and logistical challenges, these screening programs have been shown to significantly reduce the incidence of SCD among athletes. Italy's pre-participation screening program, for example, reduced SCD incidence in athletes from 3.6 per 100 000 to 0.4 per 100 000.

Lastly, and for me the most important issue, increasing the availability of AEDs and ensuring widespread training in cardiopulmonary resuscitation could save lives when SCD does occur. The success of these interventions is well-documented, particularly when AEDs are used within minutes of cardiac arrest.

Conclusion

Sudden cardiac death in athletes, while very rare, remains a critical issue in sports medicine. The 20-year analysis from Portugal sheds light on the incidence of SCD in a previously understudied population, while also highlighting the need for more accurate data collection methods, such as national registries and mandatory reporting systems. Understanding the risk factors and epidemiology of SCD is essential for developing targeted prevention strategies and improving emergency response measures. As the number of athletes in Portugal and worldwide continues to grow, so too must our efforts to protect them from this unexpected and deadly threat.

Conflicts of interest

The author has no conflicts of interest to declare.

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