A Case of Subtle Coronary Artery Disease in Master athlete: What to Do?

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Abstract

Sports pre-participation screening (PPS) of athletes is the most common method to prevent sudden death and advising them regarding exercise modality prior the competition. Being able to recognize Master athletes at risk of coronary events is an important part of pre-participation screening. Appropriate guidelines have been developed that allow physicians to pro-ceed with confidence in screening and in recommending test-ing for athletes at risk. This anecdotal case report describes the difficulty of sports physicians in making a good decision when in disagreement with their colleagues, who carried out further cardiovascular imaging. In this case latter gave a different inter-pretation in an asymptomatic athlete with inducible myocardial ischemia on Ex-ECG stress test due a subtle LAD atherosclerosis.

Keywords: Coronary artery disease; Athlete; Pre participation screening

Introduction

Besides the therapeutic success that allowed a significant decrease in mortality and morbidity related to HIV infection since the introduction of antiretroviral therapy (ART), complications are potentially serious or even fatal [1,2]. Neurological manifestations are one of these severities [3]. They are frequent, varied, sometimes debilitating and occurs at all stages of the disease. They pose a diagnostic and management problem and remain a major cause of death [2,3-6]. This may be of infectious complications related to the underlying profound immunosuppression or attack of nerve or cerebrovascular cells by HIV [3,4,7]. These data underscore the interest to know the central nervous system manifestations occurring during HIV infection.

Epidemiology

Atherosclerosis coronary artery disease (CAD) is by far the leading cause of exercise-related sudden cardiac death (SCD) in athletes aged > 35 years [1]. A significant number of victims have established risk factors for CAD. Approximately two thirds of community-based Masters Athletes (MAs) have at least one established traditional cardiovascular risk factor with a family history of premature atherosclerotic disease and prior tobacco exposure identified as the most common issues.

Among community-based Masters Athletes, the estimated prevalence of established cardiovascular disease is a approximately 10 % and is accounted for almost exclusively by atrial fibrillation and atherosclerotic coronary artery disease [2]. Considering that a resting ECG has a low diagnostic value for detecting silent CAD, all health professionals use conventional exercise-ECG stress testing (Ex-ECG) to identify athletes with the most severe disease, although this exhibits low sensitivity and specificity in asymptomatic individuals [3]. For these reasons all international guidelines recommend accurate assessment in asymptomatic athletes with risk factors, even though it is well known that a negative Ex-ECG stress test should not provide reassurance in athletes who practice vigorous and sustained exercise. However, the Ex-ECG stress test remains the first choice to evaluate underlying CAD with high risk of SCD in MAs [4]. Furthermore, Computed Coronary Tomography Angiography (CCTA) coronary calcium is probably the best method to identify silent CAD when inducible myocardial ischemia appears during Ex-ECG stress test for PPS. Herewith the author reports an emblematic case of subtle CAD in MAs.

Case Report

A middle-aged amateur athlete came to our centre for Sports Cardiology to undergo a pre-participation competitive screening for a cycling competition. There were no cardiovascular risk factors apart from a smoking habit of ten years before and his family history was unremarkable. The general objective examination, especially the cardiovascular examination, was normal. The resting ECG was within the standard limits (Figure 1-Panel A), while the maximum stress test on the cycloergometer was positive for reduced coronary reserve (Figure 1-Panel B) showing significant signs (marked ST-segment depression in the precordial anterior leads) of inducible subendocardial ischemia at low external workload (150 watts; 7-8 Mets) with the appearance of mild chest discomfort and muscle exhaustion. The ST-segment depression remained at up to three minutes of active recovery. Since the post test probability was estimated as an intermediate grade of coronary artery disease, it was considered appropriate to proceed with computed tomographic coronary angiography because of its high negative predictive value. CCTA (Figure 2) confirmed the presence of coronary atherosclerosis of the anterior descending artery with a complex plaque at the proximal level determining a narrowing > 50% of the lumen and to a lesser degree also of the middle tract. Therefore, invasive coronary angiography was performed, which always showed the stenotic plaque at proximal left anterior interventricular artery (Figure 3), but it was unanimously considered by hemodynamists to be undeserving of coronary revascularization surgery, although no Flow Fraction Rate evaluation carried out. Finally, the athlete was discharged with medical therapy without any precise indication of sporting activity.

Discussion

While habitual exercise reduces the risk of cardiovascular (CV) disease, it does not confer complete immunity [5,6]. MAs, men and women over the age of 35 who participate in organized competitive sports, are a rapidly growing segment of the population, which is becoming increasingly common in clinical practice [7]. Atherosclerotic coronary artery disease (CAD) is the most common cause of sudden death among MAs [8], and recent data suggest that MAs may be at higher risk for CAD than their otherwise similar sedentary counterparts [9,10]. In addition, emerging data demonstrate associations between other forms of CV disease including atrial fibrillation (AF) and non ischemic myocardial fibrosis and exercise exposure in excess of low to moderate levels [1,11,12]. However, lifestyle characteristics, CV risk factors, and their relationships with established CV disease among MAs are not completely understood. To address this knowledge gap, we reported...
Ex-ECG stress testing
Panel A: at rest  Panel B: at peak exercise

Figure 1: Shows normal ECG at rest (Panel A) and abnormal ECG with marked ST-segment depression in the precordial leads at peak exercise (Panel B).

Coronary Tomography Angiography

Figure 2: Shows CCTA findings of a complex plaque at proximal LAD coronary artery with narrowing > 50%.
the present case to explain the difficulty in taking a decision regarding sports eligibility in veterans athletes with asymptomatic CAD and inducible myocardial ischemia. The primary goal of this paper is to develop a comprehensive clinical iter of the PPS in the context of Italian law for MAs with an emphasis on the relationship between the diagnostic Cardiovascular imaging and established disease and the risk of sudden cardiac death.

**Conclusion**

This case highlights all the difficulties of taking a sports fitness decision and eligibility to race in competitions when there are contradictions in the screening tests and in particular in the investigations of cardiovascular image. In fact, it seems evident that although there is a subclinical atherosclerotic coronary disease in coronary CT with certain signs of inducible myocardial ischemia to the Ex-ECG stress test, the final examination, namely coronaryography, leaves many doubts about its interpretative correctness.

This is due the fact that it considers the obstructive lesion of the descending anterior artery not critical and therefore not suitable for an intervention of coronary angioplasty. Consequently, some questions arise that represent the key to understanding the clinical case and in particular the role of the sports doctor certifying the competitive suitability for sport competition. What to do in controversial cases like this about sports certifying? Should competitive sports fitness eligibility be granted in the light of the interpretation of the hemodynamic cardiologist or should the case be re-evaluated by another hemodynamic cardiologist? The clearly positive stress test for inducible subendocardial ischaemia with a CCTA report of proximal stenotic atherom asia of the anterior descending coronary artery certainly cannot be considered a false positive. It follows that legal medical liability in these controversial cases cannot be attributed only to certifying physicians, but also extended to the various consultants. So, who is to manage asymptomatic Master athletes with a CAD diagnosis?

**Conflicts of Interest**

The author has no conflict of interest to declare.

**References**


