

Infectious mononucleosis skin rash without previous antibiotic use in a collegiate athlete: A case report

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Abstract

Background: A nineteen-year-old male Division I soccer player presented with an abdominal rash while otherwise asymptomatic. Laboratory testing revealed the diagnosis of infectious mononucleosis (IM). Most rashes associated with IM are the result of antibiotic therapy. This case was a novel presentation of a non-antibiotic induced rash leading to the diagnosis of IM. **Intervention:** The physician recommendations were to cease sport-related activity for three weeks due to possible splenomegaly. Adequate fluid intake, rest, and analgesics as needed were directed. Additional laboratory testing was ordered to rule out a concomitant bacterial infection. Mild symptoms consistent with infectious mononucleosis were noted by the athlete one-week post-diagnosis which were successfully treated with over the counter non-steroidal anti-inflammatory drugs. A follow-up three weeks post-diagnosis showed reduction in rash and no symptoms. The athlete was cleared to participate in a return to play conditioning program. **Outcome:** Upon successful completion of the conditioning program the athlete returned to full participation four weeks after the initial diagnosis. The rash disappeared approximately two weeks after the athlete's return. **Uniqueness:** This case is unique because the rash was not attributed to antibiotics which is inconsistent with many skin eruptions associated with IM. The high incidence of infectious mononucleosis in the adolescent population requires allied health professionals to readily identify the wide array of its presentations.

Keywords

Epstein-Barr virus; eruption; antibiotic; return to play

Abbreviations

IM: Infectious mononucleosis; EBV: Epstein-Barr virus; RTP: Return to play

Introduction

Infectious mononucleosis (IM), caused by the Epstein-Barr virus (EBV), is a prevalent upper respiratory tract infection among adolescents and often referred to as the kissing disease due to the common mode of viral transmission through saliva [1,2]. Symptoms of IM include fever, exudative pharyngitis, ma-

laise, lymphadenopathy, palatal petechiae, rash, and splenomegaly [3]. Primary EBV infection in the pediatric population has been associated with dermatological or cutaneous manifestations including erythema multiforme and Gianotti-Crosti syndrome [4]. Clinical diagnosis of IM can often be achieved with the heterophile antibody test (monospot) [1,2]. Serology for antigens specific to EBV (IgM, IgG, and EBNA) is vital for determining a primary, past, or reinfection [1,2]. Physical examination or diagnostic imaging for splenomegaly only provides limited information for making clinical decisions [2,3,5]. Treatment of IM is typically limited to symptom management consisting of adequate rest, hydration, and analgesics [1-3]. Intervention involving medication may include steroids, but should be reserved for severe cases of IM-related complications [1-3,6]. Additionally, judicious use of antibiotics is advised for those with IM as some patients will develop a rash following the treatment [3,4,7]. The skin symptoms may develop due to the viral infection, but most examples found in literature are associated with concurrent antibiotic therapy [8,9].

The incidence rates of an antibiotic-induced skin rash in patients with IM are cited in some texts to be as high as 100% [10,11]. Data reflecting recent cases show antibiotics such as amoxicillin resulted in eruptions in up to 29.5% of patients with IM [10]. Notably, an adolescent presented with a skin eruption several days after the treatment of a fever and sore throat with antibiotics and was subsequently diagnosed with IM [8]. Few cases of skin eruptions without significant prior antibiotic history were observed in the literature [6,12]. Reports of non-antibiotic induced skin rash in EBV-infected patients have been as high as 23.1%, though the authors attributed these findings to possible selection bias of hospitalized subjects [10]. The incidence of non-antibiotic induced skin rash has not yet been well documented. Moreover, the impact of this presentation on an athlete's return to play (RTP) is not well known.

The current evidence-based protocols for returning an athlete with IM to sport are general and could present challenges to physicians and athletic trainers when managing an EBV-infected athlete [2,3,5]. Concerns for an athlete with IM typically revolve around the risks for splenic rupture and the presence of a fever while general guidelines include three to four weeks of rest followed by a gradual return to activity. [2,3,5]. Studies of patients with IM show the spleen usually reaches its maximum size three weeks after diagnosis and gradually returns to normal thereafter, but it is unclear as to when all spleens will return to baseline [5]. A patient's level of physical conditioning is expected to decline during their illness [3]. Individualized RTP protocols could be beneficial due to the variability of symptom severity as well as the difficulty in determining the degree of deconditioning that has taken place. Documentation of these protocols may contribute towards the current evidence-based approach to RTP guidelines for an athlete with IM.

Case Presentation

Patient: A nineteen-year-old male Division I collegiate soccer player presented to the athletic training staff with a maculopapular rash on the lower and upper right abdominal quadrants continuing to the right flank. The athlete's history showed they have no known allergies, no history of similar skin conditions, and was not under care for an injury, illness, or skin infection. Additionally, he indicated no current use of prescription, over the counter, or illicit drugs. The chief complaint was the abdominal rash and was not accompanied by other signs or symptoms. Physical examination revealed no remarkable abnormalities

(vitals, lymphadenopathy, petechiae, presence of exudate, abdominal pain, etc.). The athlete was referred to the University's health services for further evaluation after which they received a rapid strep and monospot test. Further serology showed positive results for antigens IgM and IgG which are consistent with a primary EBV infection. Physician instructions were to cease all soccer-related activity for three to four weeks, rest, keep fluid intake high, and take over the counter medication if symptoms arise. No ultrasound examination for splenomegaly was ordered. No medication was provided for the rash. It was non-pruritic, did not cause discomfort, and was left untreated.

Intervention: The athlete was excused from participation in all soccer-related activities for three weeks pending a physician follow up. One week post-diagnosis the athlete complained of symptoms consistent with IM including mild pharyngitis and feelings of malaise and myalgia which were treated with over the counter non-steroidal anti-inflammatory drugs. No other interventions for the illness took place. The athlete was asymptomatic for approximately one week and the area of the rash had reduced significantly leading up to the follow-up appointment with the physician. They were cleared for one week of physical conditioning due to their asymptomatic presentation. The regimen was to be carried out under the supervision of the athletic training and strength and conditioning staff as part of the athlete's RTP protocol. The physician instructions for the conditioning week included avoiding activities that may increase the risk of contact to the abdomen. No additional testing took place during the follow-up examination.

The conditioning week consisted of cardiovascular endurance training, bodyweight resistance exercises, and sprint training. Rate of Perceived Exertion scale was used as an indicator of exercise intensity to adjust workloads and rest periods appropriately. Bodyweight resistance exercises performed include squat jumps, lunges, planks, pushups, mountain climbers, and burpees. These were performed in circuits limited to three to four per session while keeping exercises per circuit and circuit lengths moderate. Sprints were performed at varying distances of seven to fifteen meters with rest times between thirty and ninety seconds. Low-intensity aerobic exercise was the focus for the initial three days. The following three days focused on moderate-intensity cardiovascular endurance training and bodyweight resistance exercises; and the last day of conditioning introduced sprint training and high-intensity bodyweight resistance exercises.

Outcome: In the first week following the initial IM diagnosis the athlete was able to perform daily activities such as attend class, observe practice, and complete schoolwork. The mild symptoms they developed resolved towards the end of the second week post-diagnosis and did not significantly interfere with the athlete's ability to perform the previously mentioned daily activities. Complications regarding the athlete's illness or conditioning were not experienced during the RTP protocol. Four weeks post-diagnosis the athlete was cleared by the physician for return to full participation in soccer. There was not a second follow-up examination performed. The athlete remained asymptomatic from that point forward, though it took approximately two additional weeks for the rash to disappear.

Discussion

This athlete's case differs with other reports of IM-related rashes as most events found in literature are caused using antibiotic therapy. Antibiotic induced skin eruptions in EBV-infected patients will typically

occur several days following the use of antibiotics for treatment of symptoms resembling bacterial respiratory tract infection [3,4]. Hypotheses for the mechanisms of eruption include an immunologic hypersensitivity reaction to the drugs or involved metabolites [4,10]. One case involved a concurrent antihistamine prescription with a similar purported immunologic response [6]. Another article cites a case of skin eruption in a patient with IM implying the rash was caused directly by the virus [12]. In the case presented it may be suggested the skin eruption is related to the virus, though distinguishing the relationship between the two is not the intention of this case report. Overall, it's clear that the source of skin eruptions associated with EBV and IM are not completely understood.

After a review of the athlete's history there was no indication of current or recent antibiotic use unlike previously cited sources. Additionally, the athlete initially presented with no signs or symptoms of an accompanying viral or bacterial respiratory tract infection which is contrary to what has been observed in past cases. However, the outcomes were similar and a full recovery without further complications was achieved by using comparative interventions.

The RTP guidelines regarding athletes diagnosed with IM are somewhat general since symptom severity varies and are typically self-limiting. Some recommend an athlete diagnosed with IM to cease contact sports and vigorous activity for three to four weeks as this time frame is most commonly associated with splenic injury [2,3]. Serial diagnostic imaging has proven to be effective in diagnosing splenomegaly and is recommended in favor of physical palpation [5]. Though, the clinical applications of imaging in assessing risk for splenic rupture are still of questionable value [2,3]. A gradual introduction of non-contact activity is recommended after three weeks as long as the athlete is afebrile and asymptomatic [2,3]. Some literature suggests early return to light exercise poses little to no threat and RTP can be individualized for each patient [3]. The RTP protocol for this athlete reflected the key points outlined in research. After completing a gradual return to their prior activity level, the athlete was cleared for full participation by the physician. The presence of the skin eruption did not impact the athlete's treatment or RTP protocol.

Infectious mononucleosis is a prevalent and self-limiting illness among young athletes. The information presented can contribute to available sources of evidence of dermatological manifestations associated with EBV as well as current evidence-based protocols involving athletes with IM and their return to physical activity and competitive sport. This case shares similarities to previous incidents of children and young adults experiencing acute IM. The uniqueness lies in the presence and resolution of a skin eruption occurring parallel to a primary EBV infection without the involvement of antibiotics.

It is important to understand the manifestations of EBV and the clinical presentations of IM in the susceptible population of young athletes. Cases of IM involving non-antibiotic induced skin rash appear to be rare but uneventful with regards to further complications. Athletes diagnosed with IM may benefit from individualized reconditioning based on their symptom severity to optimize RTP. The high incidence of IM in the adolescent population requires allied health professionals to readily identify the wide array of presentations and refer appropriately to begin treatment and management.