Dangers of Youth Sport Specialization

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Abstract

Introduction: Year-round training in a single sport at a relatively young age is increasingly common among youth athletes.[1] Contributing factors may include a parent's desire to give their child an edge, labeling youth as *talented* at an early age, pursuit of scholarships or professional contracts, and increase of private league (club) sports teams.[2] Risks of early specialization include: overuse injuries, muscle imbalances, degenerative disorders, acute traumatic injuries, social isolation, and dependence on athlete identity.[3-6] **Purpose:** The purpose of this review was to examine evidence of the injury risks associated with specialization in sports at an early age. Evidence from this review can aid educational efforts for athletes, parents, and coaches. **Methods:** Peer-reviewed literature was obtained by using the search terms *youth sport specialization, sport specialization injury risks,* and *psychological effects of sport specialization* in SportDiscus, PsychInfo, and Google Scholar, resulting in 40 articles. Articles were reviewed for common themes. **Results:** Research suggests specializing in one sport during youth development increases risk of short and long-term injury.[3,7] Acute and overuse injuries may include muscle strains and ligament sprains. Overuse injuries may include apophyseal injuries, osteochondrosis, epiphyseal injuries, stress, muscle imbalance, and ligament or tendon trauma[8,9]. Research suggests athletes may develop psychological challenges, growth impairments, and physiological imbalances due to early specialization. **Conclusion:** Athletes, parents, and coaches can benefit from increased education on the adverse effects of specialization at a young age. An increase in overall fitness, body coordination, muscle strength and conditioning, healthy bone growth, and psychological health may be achieved by participating in cross training and adequate rest seasons. These improvements may collectively decrease injury predisposition in young athletes. Future research should include long-term research studies to investigate adverse effects of early sport specialization on the body and mind of athletes.

Introduction

As organized sports participation in the United States continues to grow annually, beyond 30 million children, studies of epidemiological patterns of injury have increased[2]. It has recently been shown that more than 2.5 million sports injuries were reported annually in patients 24 years and younger, and at least half of the incidences reported to the emergency room were overuse injuries[2]. As defined by the American Medical Society for Sports Medicine (AMSSM) position statement, overuse injuries occur due to repetitive submaximal loading of the musculoskeletal system when rest is not adequate enough to allow for structural adaptation[1]. A contributing factor to the epidemic of overuse injuries is youth specialization. The American Orthopedic Society for Sports Medicine (AOSSM) defines early specialization as focusing on one sport to the exclusion of other sports training that occurs more than eight months per year, prior to age twelve[11]. Youth sport participation provides benefits to the athlete that include increased self-esteem, peer socialization, and general fitness, but when specialization occurs, the young athlete is at risk for a number of detrimental health effects[9]. This poster will review the risks identified in the research literature associated with youth sport specialization in athletes age six to fourteen.

Methods

40 articles were examined and reviewed for common themes that included the risk of youth sport specialization in regards to injury prevalence, injury risks, psychological factors, and external pressures on the athlete.

Results

Specializing in one sport during youth development may increase risk of short and long-term effects including:

Acute injuries:

Specializing in a single sport may predispose young athletes to acute injuries. These injuries, such as sprains and strains, can result from muscle strength and tension imbalances[12]. Imbalances are often seen in athletes that over-train a specific skill set, training pattern, and physical movement. For instance, over-development of the quadriceps muscle group with a lack of hamstring group development predisposes athletes to acute hamstring strains. In addition, young athletes participating in baseball or softball hit and throw predominantly from one side. This results in a repetitive rotational pattern in one plane and direction, which can lead to increased muscle tension and imbalances, misalignment, and risk of sprains and strains[10,13].

Overuse injuries:

Specialization in youth sport may also increase risk of overuse injuries[6]. As discussed above, when youth over-train specific muscle groups while growing apophyseal and epiphyseal injuries may occur. Common apophyseal injuries include Osgood Schlatter's disease, Sindig-Larsen-Johansson syndrome, and Sever's disease[14]. Osgood Schlatter's disease is a common occurrence in growing adolescents caused by the rapid change in bone, muscle, and tendons. This may result in inflammation at the patellar tendon insertion site on the tibial tuberosity[14]. Epiphyseal injuries, such as a Salter-Harris fracture, can occur from repetitive stress in adolescents during training[15]. Specialization and elongation of this repetitive stress poses a risk to the structural integrity and health of adolescent growth plates[15]. Other overuse injuries may include tendonitis, tenosynovitis, microtrauma (stress fractures), and weakening of ligaments and tendons leading to increased acute injury risk.

Long term effects:

Young athletes in multiple sports had higher values of neuromuscular control during landing phases of athletic movements, compared to athlete in sport specialization groups[16]. Neuromuscular control and general motor skill development are important factors in decreasing injury risk[17]. Adolescents who play in one sport year-round do not have the opportunity to explore other physical activities. This can be projected as a potential predisposing factor to burnout, degenerative disorders, or a sedentary lifestyle in adulthood[18]. In addition, young athletes may develop an athletic identity with one sport, leading to potential psychological risks if injury, failure to perform, or other factors remove this identity[18].

Discussion & Conclusion

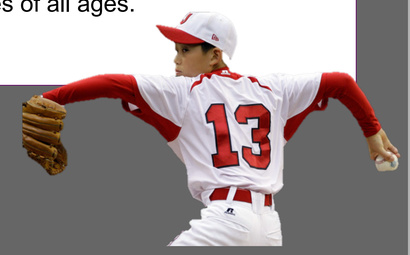
Due to research suggesting predisposing factors of youth who specialize in sports at a young age, attention should be directed towards the decision to specialize. Young athletes may want to specialize for intrinsic reasons and a desire to be the best, but there are often other external pressures[2]. These may include the incentive of college scholarships and professional teams, parents who want their child to succeed for scholarships or their own personal interests, and club coaches looking for talent to further their team's success[2].

Young athletes may feel this external pressure in addition to their own desires, and develop an athletic identity specific to their sport. This can lead to psychological effects such as burnout, loss of interest in other activities, and increased stress and pressure to perform at a high level[18]. Cross training and participating in multiple activities during development aids the physical and cognitive skills necessary for excelling in a primary sport in the future[16,19].

Through cross training, youth can increase motor control, coordination, balance, and early muscle strength development through functional movement, which helps reduce the chances of acute and overuse injury[20]. To avoid the risks of specialization, athletes, parents, and coaches should be educated on the benefits of cross training and multiple-sport participation.

As athletic trainers, we have the ability to positively impact young athletes and their community. Often, the athletic training focus is on high school, college, and professional athletes, but a large portion of the athletic population is within the crucial development stage of youth (6 - 14 years old). Injury risk may be decreased by educating athletes, parents, and coaches when youth become serious about sports and consider specializing in one year-round. This may be achieved by athletic trainers attending and speaking at sport pre-participation meetings, holding seminars at elementary and middle schools, and connecting with physical education teachers who facilitate a range of activities within their school curriculum.

By educating the community on dangers of sport specialization, athletic trainers can have an integral part in the prevention of injury, decreasing the prevalence of long term health effects, elongating athletes' career, and promoting the well-being of athletes of all ages.



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