Essentials of Sports Injury Prevention & Rehabilitation

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Lecture - 30
Injury prevention in adolescent athletes & Women athletes - Part 01

Good morning friends, myself Dr. Atul Sharma. I am your guide for essentials of sports injury prevention and rehabilitation. This is the seventh week and this week we are going to study about adolescent or young athletes and female athletes. So, let us start with the adolescent or young athletes.

Young athletes are those who are less than 18 years of age and their skeletal maturity is yet to be completed. So, they are very peculiar and they are considered in junior or sub junior levels. They can participate in the senior also, but if their categories are junior and sub junior like in gymnastics they participate in senior level tournaments also. So, what are their peculiarities? One should be extra careful about when he is or she is dealing with the young athletes.

So, let us start. The first and foremost thing about the young athlete is that, their ossification centers for the bones are not yet fused. So, their bones are still growing, their muscles are not fully developed, they are emotionally very tender, they are not emotionally so independent, they cannot take their own judgment, they require their parents or guardians to monitor them. The bones generally grow till the age of 18 in males, and in females generally 13 to 15 as their growth spurt occurs. In the female athletes, the first growth spurt comes around 9 to 10 years of age, and the other 13 to 15 years of age.

Same in the male athletes, the first growth spurt around 11 to 13, and the second one around 16 to 18 years of age. These are the growth spurt now which they gain their height, they develop their physical appearance also like pubic hair, axillary hair, the body become more muscular in the male. In the females the thelarche and menarche got started and the menses cycle gradually regularized, and the ovulation also started in the later cycles also. So, these athletes are adapting to become adults. The motor skills like endurance, speed, agility are yet to be developed and they are emotionally tender. In these athletes there are still two kinds of athletes, like those who develop their bone maturity quite early, the other ones are late maturers, their bones are still not developed and they are less in height they still have a chance to grow.

Those who mature early, in the junior and sub junior levels they perform better as per their height and weight; and those who are late maturers. it's not necessary, but they are the ones who develop later on and they perform well in the later aspect. But on the skill aspect, they both are equal. Early matures are older than their age. They are bigger in size, mentally they are the same age they have not grown up so early so mature so they can take their decision legally, and late matures, they attain puberty late, looks younger and performance remains an issue. Now we talk about the young athletes, how they are different anatomically from the adult athletes, physiologically and psychologically. The bone growth in the bones are not fully developed, the epiphysis that is secondary ossification centers are not fused, there is still chance to grow, their bone mass is still less and the secondary sexual characters are yet to be developing, their molar teeths are not developed, and the bones are shorter in length, and the bones will grow in girth also in the thickness also. Physiologically, their VO2 max is still less, but it is as per their weight and their weight according to age and weight they are near about only but still this thing has to be grown.

Their capacity and their thermoregulation center or thermoregulator system is not fully evolved, and there are more chances in the young athletes to develop heat related issues like heat stroke, heat exhaustion. They are more prone to this, and as I just informed you also keep the emotional aspect. They can't take legal decisions independently, they are not fully mature, they're still a kid, they also suffer from the injuries which they suffer are the traumatic injuries and non-traumatic injuries. Traumatic injuries are fractures, growth plate disturbances, avulsion fractures and green stick fractures. Apart from this, there is a sprain and strains also those occurs in the adult non-traumatic, they also suffer from the type 1 diabetes, asthma and anemia also. So first we discuss about the fractures, though the chances of fractures are very less in the flank because their bones are more flexible. Traumatic injuries or fractures fractures are the discontinuity of the bone, it may be open or closed fractures, it can occur to anybody and in any sports, but the peculiarity in the young athletes are the growth plate disturbances, where the secondary ossification centers or the growth plates can be disturbed, and it is not easy to diagnose those fractures and it required a specialist help and for this close monitoring of that is also required. And generally for the assessment, it requires bilateral X-rays, because the specialist has to compare with the normal limb and the abnormal limb also, where the and that player has suffered injuries. The fractures in the young adult or young athlete required close supervision of a specialist. Growth plate disturbances are quite common also, as I just told, require close supervision and the avulsion fractures are much more common in the young adults rather than the elder ones, because the differences where tendon or ligament in tendon insert they are not well grown, and the power in the tendons are much more. So, this mismatch of the power causes avulsion fractures, while in young athletes there is a rupture of tendon rather than in the young athlete there is an avulsion fracture where the chip of bone comes along with the tendon and tendon generally does not break. In the green stick fracture, one side of the bone just got and few parts of the bone got generally these fractures, and the young athletes unite well and

do not cause any kind of residual abnormality.

So, non-traumatic diseases in the young athlete: Diabetes is quite common in the young athletes, not common but in the entire diseases the type 1 diabetes, heart diseases are quite common. Non-traumatic diseases, diabetes, asthma, heart diseases and anemia are common diseases which adolescent athletes may or may not be suffering from. They start from traumatic injuries after greenstick fractures. In the traumatic injuries you might have heard about these diseases as well as Osgood Schlatter or osteochondritis. They are the diseases with the growth plate disturbances, and they are different from the normal fractures other injuries which adults also face like fractures. It requires a plaster and correct correction also.

When we put plaster for the young athlete, the rotational part also has to be considered, because if some rotational injuries occur, so lifelong that disability will be there. And in osteochondritis and Osgood Schlatter, the intensity of the sports and sometimes that particular sport has to be changed. It requires rest and sometimes intra-articular injections also. So, it requires a special treatment, and generally patient gives history of overloading and with a trivial trauma. And trivial trauma is a thing which bring patients to the doctor and initially they insist this started with this trivial trauma.

But gradually when you interact they start saying no it was persistent before, that it was milder but now it has aggravated. So, parents also have to be vigilant, and they also have to be very careful about the loading of their kids. So, that optimum loading should be there, but if with the overloading some pain and limping or if he is having difficulty in some moment, so it should be referred to as early as possible. And like few of those who are predisposed for diabetes or heart disease or asthma they should consult with the doctors. And, there is an athlete or parents who bring their child into the club. The coach and the administration should ask them for their basic medical examination of their kids to rule out any congenital disorders like type 1 diabetes, any heart disease like valve disturbances.

There is any ophthalmology or other diseases. So, the doctor who is examining the kid to participate in the competitive sports should check for the murmur, any bronchial sounds or the anemia, all the joints and the secondary ossification centers like tibial. Then tenderness in the trochanteric or greater trochanteric area or tenderness in the spine. These should be checked, and the range of motion at all the joints has to be examined at the time of an examination should also include their height and weight chart, their growth, their birth charts also. The delivery was normal or it was caesarian, the birth weight and how this kid is progressing, their height, weight chart and every yearly this chart has to be maintained.

So, the growth pattern should be monitored; whether he requires any nutritional support or the nutrition is on the right path. Complete blood count should be checked once in a year, or

whenever he complains of deterioration of performance then he requires counseling and all the stakeholders like coach, their parents and his colleagues, his peers also has to be counseled. He is eating properly or he is just ignoring or he is not taking part or something is troubling him. Simultaneously, one has to be checked for the deficiencies like Rickets or like bossing of the wrist and these things have to be examined. Their sessions should be documented, the practice of athlete diary should be maintained in their diary.

So, in the later age and when they become a professional athlete, they should maintain their athletics diary in which they should maintain about how they have performed training, how many tournaments they have participated, what is their performance and about their diets also they have to enter each and everything. If he is a javelin thrower, how many javelins he has thrown today and what were his training sessions, how many exercises, how many repetitions of particular exercises he has done. So, all these habits have to be developed at a young age. And week activities should be gradually increasing and as per the age wise recommendations, like up to 14 years of age only 10 kilometers per week has to be allowed, and as the bone matures, after 16 years, half marathon can be allowed and after 18 years or 17 years of an athlete, he can participate in full marathon. Till the time his heart and the other physiological like VO2 max is reaching up to maximum level. It is not that 17 year athlete, he just started training and all of a sudden he participated in a full marathon.

It also depends on the training age. Training age means that the age from which he has started his training of that particular sport. It does not mean he has been playing other games since the age of 9. Now he has switched over from another game. So, his total sports history is from 9 years, but his training age for that particular sport has now changed from the day he started playing that sport.

And during childhood, all apart from that main game, the other game should also be encouraged. So, the overall development of a kid, the other body parameters, like if he is a judo player, but he required speed and endurance and agility. So, all these parameters have to be monitored and if he plays only one game, so that particular bones or particular range of motion only get developed, the other parts will not be so well developed. So, these young athletes have to be encouraged to play other games or other exercises also.