

Essentials of Sports Injury Prevention & Rehabilitation

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Lecture - 34

Injury prevention in adolescent athletes & Women athletes - Part 05

Good morning friends, myself Dr. Atul. This is our seventh week and lecture five. Today we are going to study about the types of exercise which one has to do during the pregnancies and what type of exercise one has to do during pregnancy. So any pregnant lady comes to you or she comes for the consultation as a healthcare professional, or as a gym professional one should advise for the complete evaluation by the registered practitioner or a gynecologist.

So she can evaluate her and tell about her condition, how is the fetus, and how is the condition of her cervix, whether it is competent and where is the placenta is placed and the normal blood markers, like she is not suffering from anemia, she is not suffering from any heart ailment or she is not suffering from some any other diseases which might have a negative impact on the exercises. So, when you examine all these parameters, then she came to you and now it is you have to ask her or to do certain tests like, first you have to check her VO₂ max level by walking method, or if she is an elite athlete or she is an athlete, she must be knowing, and she can tell “this is was my basic parameter before conceiving, and after conceiving I want to evaluate myself, and these are my medical checkup records”. So then, you can conduct the various tests which are clinical or outdoor tests like nine minute run, or nine minute jog test which can tell about the VO₂ max level or beep test also. So you have to evaluate her VO₂ max, and then advise her on aerobic activities. Aerobic exercise should be in a gradual manner, and if she is totally novice, and she has just a sedentary life, so first you have to start with a little bit of activities like just walking for a 500 meter, then if she is not able to walk and go for 500 meter in a particular time, then you have to ask her to just walk at her speed and that is for at least 20 minutes or 10 minutes in a day, and then gradually increase; and after every month you can or after every quarter, you can ask her to report to the her gynecologist or as per schedule advised by the gynecologist. And, after aerobic training in which you can ask her to walk you can ask her to do a little jog on the softer surfaces.

Jog means not a high impact jogging or running on a track, she can do a brisk walk also. Cycling and other things are not advisable during the pregnancy, so try to avoid those who are not well accustomed to cycling. Weight training is also required, because it stimulates the skeletal

muscles and it reduces the insulin resistance. So weight training start with the lower weights or lower resistance band, and in a proper range of motion, and it is a complex exercise rather than the joint specific or a particular muscle specific exercises, and major group has to be affected rather than the smaller group; and the stretching exercise is generally to be avoided when there is an extreme stretch is required, and doing yoga up to a level where stretch is too much or then it is not advisable. But yoga in general those asanas, which are comfortable but those that give pressure on the womb, those exercises are advised to be avoided. And, as I earlier mentioned, a high intensity exercise like sprinting or climbing hills or down stairs or jumping in a pool should be avoided. So we have studied about the pregnancy in athletes and exercise and benefits of exercise in athletes, or a normal human being. Now we just discussed briefly about the female athletes, what problems they face and how we can overcome those problems as soon as young athletes, because of their high intensity exercise they go under the amenorrhea, and bone loss and the same happens after the menopause also. As soon as the menopause occurs, the estrogen hormone is not up to the that level, and these are the hormones which protects bones and bone resorption and bone remodeling does not occur, and so the bone loss starts very fast, and the chances of stress reactions or fractures are quite high.

So, after menopause the female athletes or those who are planning to do some exercise their calcium intake has to be high, and all of a sudden don't start doing high impact exercises like running on a hard surface, or lifting a heavy weight. All these exercises should be in a gradual and progressive manner, and when you are planning to do all these exercise, wear a proper gear; like if lady who is planning to start running on a hard surface, so first she should start walking, then she should go for the brisk walk once after 15 days of without complaint, and then after a month she can go for running with the proper cushioning sole and with the regular calcium supplements. The elderly athletes, they have to maintain their hydration, the color of urine is a better indicator for the hydration part, and the color of urine should be like a lemonade, freshly prepared lemonade, and they should be adequately hydrated. Apart from aerobic exercises, elderly athletes should do weight training exercises initially with the free weights and light weights; the number of repetitions are more and the weight is less. And gradually, as the body allows, then they can increase the weight and later on they can use the resistance band, and as I just mentioned low resistance and high repetitions; and after every quarter or after a half year they should undergo for the medical checkup for their bone density or their hypertension by the blood pressure, their complete blood cell count, and if they are suffering from diabetes, they should check for their insulin level or their fasting and postprandial glucose levels. Complete exercise chart: include balancing exercises and pelvic floor exercises. As the age progresses, urinary incontinence is quite a common problem in the old ladies, so pelvic floor exercises improve the bladder control and the incontinence is reduced. Balancing exercise also provide them as the age progresses the old age not only male or it also includes females also the balancing so if the strength training is a part of their regular exercises, it improves their balancing also. So now, just a small talk on the breast care of the female athletes. So, female

athletes have to take care of her breasts also; and the common problem in combat sports is a contusion. So, the extra pad should be provided when an athlete is participating in a combat sport; so the contusion and the other direct trauma to the breast can be prevented. Those who are involved in endurance events, affects the nipples, they are very soft organ, and they got chipped off, so one should be wearing proper size bra, and before starting any endurance event, she should apply a petroleum jelly and she should cover her nipples with the tape so the friction doesn't occur and she should wear a snugly fit bra, seamless bra with separate cups and with the support from either y-shaped or crisscrossed support. It should not have a hook. So, one has to be very careful while selecting a sports bra, and before starting any endurance event, she should apply a petroleum gel, and if it is quite cold then she should cover her nipples with the tape.

We have just read about the adolescent and young athletes, and these are the athletes who are not fully matured enough, and they are generally playing the junior and sub junior or youth category; their bones are not fully grown their secondary sexual characters are yet to appear, their secondary ossification centers are not fused, and they are prone for certain diseases which only occur during the childhood like Osgood-Schlatter disease, these are the diseases which occurs exclusively in the young or adolescent athletes, and these athletes are two types of those early mature and late mature early matures are ones they as compared to their peers, their bone growth or their height all of a sudden grows, and they are taller and they are more muscular as compared to similar age of the other kids, and late mature they grow slowly and attain maturity quite late. Those who are early mature, generally in combat sports or where their body must allow them to perform better they perform better in those sports, and while late matures if they are more skilled and once they attain puberty they grow up in size; so they perform at that level also. So main difference between them is, there anatomical bone growth, physiological motor skill and endurance capacity has to increase, and psychologically they are more tender. They don't take emotional decisions, so they required a guardian support and good support also and a good thing has to be taught during this time so lifelong they will be imbibed to that.

Common injuries are traumatic injuries and non-traumatic injuries. Non-traumatic injuries are the diabetes, asthma and heart disease and epilepsy also and those adults who are youth or sub junior athletes, they are suffering from some disease or these disease, their coach has to give extra care and regular medical checkup, and they should be aware about their disease, and what red flag signs they have to be informed or they should be aware, if this thing is occurring, I have to inform my doctor, or I have to give take these medications. So, they have to be very cautious, and in the traumatic injuries they are quite peculiar, they are related with the growth plates or like osteochondritis, avulsion fracture because they are rather than tendon got ruptured with a bone get avulsed from the joints. And, when coaches is starting their training their basic medical examination should be; he should ask their parents his basic medical examination should be carried out, and he should ask for their weight charts, their birth weight and everything, whether delivery was normal, or it was a c-section; and other things whether any congenital disability or any congenital deformities are not there; and doctors can check for the any sign of deficiencies

like Ricketts or other childhood disorders. The coach should be devoted; it's not like a hundred players and one coach. In the young athlete, the coach and player ratio should be very less so each and every athlete can be monitored personally. Aerobic activities, it imparts gradually and like a guideline 10 kilometer run should not be allowed before age of 13 or half marathon not before 16 years of age and full marathon not below the 18 years of age or around 17 years of age. When you are introducing the weight training, it should be on the low weight or low resistance and high repetitions; and it is up to the 80% of the 1-RM, and they should be gradually increase the skill training and these training should be as a part of enjoyment, than his interest towards these sports will increase, otherwise, if it is not enjoyable for them, they leave that sports and then they shift and we will not develop those skills or they will not develop affinity towards sports. One has to be extra careful about the dietary part of the kids. They are more prone for the snacking on commonly available snacks like chips, burgers or any aerated carbonated drinks like Pepsi, Cola or other high energy drinks.

So these things should be avoided, and rather they should in snacks with the roasted gram, roasted peanuts and in limited quantities protein intake. If they are doing a heavy exercises, their protein intake can go up to 2 gram per kilogram body weight. and fat should be between 20 to 30 percent of their dietary intake, and the rest of carbohydrate and minerals and vitamins should be included. So they have to eat daily green leafy vegetables; if they are non vegetarians, then they can eat non vegetarian food; and if they are vegetarian they have to eat a green leafy vegetable in a sizable amount, and the fruits. Because of peer pressure and wrong body image, they might suffer from the eating disorders like bulimia nervosa and anorexia nervosa. These are the tips which I have already described in details.

We discussed about the female athletes, there is a skeletal difference, body composition and physiological training performance, in the strength there is not much difference between the male and the female counterpart. But the skeletal difference is that they are less in height, they have narrow shoulders, and their pelvis are wider to carry the uterus and to carry the pregnancy. Menarche is our first menses, and menopause is the last menses. Menarche generally occurs between 9 to 13 years of age, and menopause generally occurs between (above it's hereditary and sometimes it's because of some disease it occurs early), also but in general 45 to 45 or after 45 years of age. After Menarche, the body starts creating estrogens, and estrogen improves the bone health and cardio protective hormone it is, and as soon as after menopause and this hormone stops secretion in higher quantity so the bone resorption is started, and the cardio protective phenomena also is stopped after menopause. So, one has to be extra careful and similar happens when athlete who all of a sudden increase her training load or sedentary girl started doing heavy exercise all of a sudden, so their menses stops occurring. And the same thing happens like estrogen withdrawal, estrogen is not available so the bone resorption is started very fast, and bone remodeling doesn't occur, so chances of a stress fracture are quite high. So, one has to be extra careful when they start doing heavy exercises all of a sudden, so they have to take care of about their energy intake. It should be proper and high, at least their body fat composition more

than 20% if it is around 26%, chances of amenorrhea will be very less. Major difference between the male and female is heart size, their basal low basal metabolic rate, they are low in global and all because and all these play and there's because of that their vitamins is also less; but otherwise the strength if the same weight and same height is there, and they are asked to do the same strength training, they can perform the same strength training.

Menstrual cycles, I have elaborated in detail. Then, the excess exercise and menstrual circulation. Female athlete triad: it is composed of low energy that leads to amenorrhea, and that amenorrhea leads to osteoporosis. Pregnancy and exercise: pregnancy is a natural phenomena, it's not a disease, so it should not be considered or it should not be treated like a disease. During pregnancy, chances of musculoskeletal injuries and low back pain are high because of their biomechanical change, because of the growth in uterus size and because of that biomechanics got changed and that led to lower back pain. High intensity exercise during the pregnancy, it may lead to fetal injuries fetal distress, intrauterine growth retardation, prematurity and fetal malformations, because of high wall or because of the hydration, increased body temperature that may lead to fetal malformations. The benefits of exercise: doing it in the pregnant lady or the she will gain less weight, she can better cope up with the labor, less chances of gestational diabetes, reduction of preeclampsia. And, what are the contradictions? Some are the absolute, and some are the relative; like anemia and obesity, but morbid obesity is absolute and the types of exercise one can do in the during pregnancy is aerobic exercises, strength gaining exercise, weight training exercises, yoga; but high stretching one should avoid; and high intensity exercise like jump from the height or high speed cycling or skiing or para jumping or sprinting they all are contraindicated. Elderly female athletes, again they are more prone to the musculoskeletal injuries because of estrogen withdrawal, and but if they keep doing exercises and they maintain the calcium supplement or calcium homeostasis up to the level; the chances of stress reactions are less and injuries because of balance and will be less, and they must have to do pelvic floor exercises. And in the last, I have just about the nipple care, so those athletes who are involved in high endurance events, they should wear a sports bra which is made up of a good absorbent material and seamless, and on the back should be either y-shaped or a crisscross and when if they are participating in the marathon or long duration exercises, they should apply petroleum jelly on the nipple, and if they have a problem with the still they have a history of cuts and because of a heavy intensity exercise they, should protect cover that nipple with soft tape also.

Thank you so much dear friends, and all the very best.