Sports And Performance Nutrition

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Lecture-29: Immunity and gut health

Hi everybody, today's lecture we are going to be discussing immune function for athletes. Good immunity is the most essential armor for an athlete. So which are the factors that can influence immune function? What role does gut health play for boosting immunity and what are the nutrients that can help support immune function? Let's get started. You are born with mechanisms or innate immunity which can help you cope with antigens. We have very recently dealt with a pandemic where the COVID virus taught us innumerable lessons. Taking a vaccine is an example of what can be an acquired immunity.

A mild dose of virus can stimulate cascading metabolic reactions and trigger antibody production in the body to kill the pathogens. Physical status of an athlete is influenced by several dynamic parameters. The exercise induced inflammation can lower immune function in athletes or individuals who have higher training load or physical activity. In addition to this exercise strain and stress nutritional deficiencies can also add to this.

From exposure to pollution to other lifestyle habits, erratic sleep pattern, cigarette smoking or abuse of alcohol can also lower nutrients which can thereby impact immunity. So the body's ability to always keep you in the pink of health is essential especially if you have high training requirement or practice regular physical activity. Demanding physical activity coupled with poor eating habits can pose a real challenge to immune function. If you remember the first initial chapters on energy availability, a basic calorie intake is extremely important for athletes to keep healthy and that is about 45 kilocalories per kg of lean body mass and if it's younger children to support their growth in adolescence you may even need over double the amount of calories excessively skimping on food and cutting calories without any logic can lower exercise performance. Also a poor calorie intake can not only exaggerate nutrient deficiencies it will also lower immunity.

Similarly adequate carbohydrate consumption particularly even during intense exercise can keep the stress hormone cortisol in check. Cortisol's function is the flight and fight response. So it mobilizes glucose faster can even lead to the loss of muscle mass. Chronic or long term increase of this stress hormone can also lower immune function. Hence athletes must take care to consume enough carbohydrates before during and after workout that can blunt this cortisol effect.

Going back to the protein chapter the antibodies themselves are made up of protein so is the hemoglobin the red pigment in blood which gives you oxygen. So consuming good quality proteins in daily diet can optimize immunity. Foods written antioxidants and polyphenolic compounds such as catechins or theanine found in green tea and black tea or even matcha tea can be a good addition in daily diet for those who participate in exercise regularly. The

flavonoids found in dark chocolate are also powerful antioxidants they also help improve the good bacteria in the gut called Bifidobacterium. A quick reminder here of why you need to consume a lot of fresh fruits and vegetables.

Vitamin A is found in dark green leafy vegetables, yellow, orange and red colored fruits. So it's a very powerful antioxidant it scavenges or lowers the free radicals reduces the oxidative stress which can lower immune function. Thus meals including a lot of colorful fruits and vegetables helps improve exercise recovery. Antioxidant consumption of fresh fruits or even salads containing vitamin C can also help lower stress hormone. Cortisol is a long term or a hormone found in chronic stress.

Of the last ace vitamins is vitamin E which has a similar powerful antioxidant function. omega 3 can be very very useful not only to lower the inflammation which is exercise induced it protects the heart and also improves muscle recovery post workouts. Do keep in mind it's equally important to lower the intake of omega 6 rich foods which are vegetable oils. The ideal ratio to balance the omega 6 and omega 3 should be about 2 is to 1 where the consumption of vegetable oil is 2 times. Unfortunately in our diets because it is difficult to get the potent omega purely from the marine source being fish such as sardines, mackerel, Indian salmon or if you remember the vegetarian form called the alpha linolenic acid where the conversion can be very little as 5% and hence vegetarians need to consume large amounts of walnuts, chia seed, sea algae, kelp to make up to this.

So Indian diets can have a ratio of sometimes even 4 to 1. So the best thing to do is lower the omega 6 from the vegetable sources such as sunflower oil or safflower oil. Look at hot healthy oils which we have discussed at length in the chapter of the fundamentals of fats. By using rice bran oil, cold pressed mustard oil, till oil or even olive oil you can look at improving this ratio. For those athletes who are frequently falling ill, consuming about 10 to 20 grams of the amino acid glutamine can improve gut immunity and also health particularly if they are highly over trained and exhausted.

Having protein rich foods that give you vitamin B6 pyridoxine or vitamin B12 cobalamin can support energy metabolism or nerve conduction by upholding health. In the chapter or lecture on minerals we have discussed the individual functions, food sources of several of these minerals listed here. Iron is the core of hemoglobin or the red blood pigment. Iron is the core of RBCs and the hemoglobin is the red pigment. So the oxygen that we breathe will combine with hemoglobin and carry oxygen and also other nutrients in the blood.

The oxygen which is much needed for the contracting muscle in physical exercise is being supplied by blood. The red pigment hemoglobin binds to this oxygen and gives oxygen to break down energy for exercise. So it is very important to address iron deficiency which can be very common in athletes. For the immune function some minerals also play a very important role. Therefore consuming balanced meals and a chunk of pumpkin seeds daily can give you good amount of daily requirement of zinc.

Zinc is very important in injury to keep high testosterone levels in male athletes and also help wound healing. If the athlete has frequent episodes of upper respiratory tract infection, zinc can also support the athlete's immunity where it can help lower the proliferation of viruses. One Brazil nut consumed daily or in lieu or as an alternative if you cannot afford Brazil nuts which are imported and expensive. Even consuming a few handful of nuts like cashews or

almonds, pumpkin seeds can give you selenium which can help immune function. If you do not consume good quality proteins you can have low levels of B vitamins and that can lead to fatigue.

Coming to a very interesting topic on gut health. How athletes can take care to build good bacteria in the gastrointestinal tract which can have several benefits. Gut microbiota or microbiome the small little bacteria which is present in the entire gastrointestinal tract can influence immunity. Good bacteria lower bad bacteria and ensuring good gut health can also be the first line of defense where they kill the unfavorable bacteria. Taking care to optimize the gut health can lead to improved nutrient absorption.

Good bacteria can influence the way the body digests macronutrients, lower the appetite can help lower weight or bring down your level of obesity. The happy hormone or what keeps you calm and cool which is serotonin is mostly absorbed in the gut. Hence good bacteria can help you respond to a stressful situation better by adding or colonizing the good bacteria. We can lower symptoms of feeling low by keeping anxiety at bay. By consuming foods that can increase good bacteria in the gut we can lower anxiety symptoms and the probiotics are also known to improve symptoms in certain conditions as irritable bowel syndrome.

So the routine and regular consumption of foods that can help colonize good bacteria can influence brain function and that is called the gut and the brain axis. Serotonin is also a sleep hormone so by improving gut health and enhancing the absorption of serotonin you can also improve the quality of sleep. Other than probiotics which we will just talk about in a few minutes or varied in a diverse diet can improve good bacteria. The more the number of good bacteria the better is your brain function also immunity. How do you improve gut health? Number one you can consume a rich plant-based diet which offers high fiber.

These fibers are called prebiotic. The good bacteria ferment on these fibers and multiply in numbers. The second way to consume good bacteria is probiotics. Probiotics have live bacteria and this can improve gut health. By regular consumption of probiotics by taking care of the first two you can ensure the third way to add to gut health improvement.

The breaking down or the byproducts that are formed after the probiotics perish can also influence immune function by improving gut health. Plant foods offer various types of fibers. The soluble fiber as the name suggests mixes with water and forms a jelly. This fiber can be found in fruits such as oranges or even pulses, banana, onion, garlic, oats, barley and flax seeds. So these are also the prebiotic or fibers that help the good bacteria grow.

The insoluble fiber is found in whole grains, skin of fruit vegetables, the skin of pulses and these cannot be digested in humans but they help ease bowel movement. Resistant starch is another important way to improve good bacteria. Green bananas called plantils, cooling rice and cooling potatoes not only reduces the calorie consumption from these meals where the starch is converted to resistant starch. Interestingly resistant starch also feeds good bacteria. So next time you have some leftover rice or even roti you know there can be some good news by consuming that.

Do keep in mind you need to consume high fiber with adequate amount of water. The fiber will absorb water and swell otherwise it can lead to a lot of bloating of lattice and this gas can be inconvenient. The good bacteria ferment the fibers in the intestine and also yield small

amount of energy. In this fermentation process the short chain fatty acids which are formed also regulate certain neurotransmitters. Probiotics are good bacteria that we find in food.

The consumption of probiotics improves the mucosal membrane of the intestine. They also lower the bad or unfavorable bacteria and improve immunity. The good bacteria have a profound influence on the brain, lungs, even skin. You can still relate to the pandemic where we understood the gut and the lung axis having a good gut health supported a better lung function for those athletes who frequently catch a cold or suffer from upper respiratory tract infections. Making an effort to consume fresh probiotic foods can improve their lung health thereby lowering the episodes of upper respiratory tract infections and in my practice I have noticed this improvement in several cases.

So how can you add good bacteria into your diet? By consuming raw or unpasteurized vinegar with the mother you get some good bacteria. In most Indian meals curd is always a part of a balanced diet. Cucumber contains lactobacillus and its regular consumption can also be very cooling on hot summer days. Pickles or even vegetables that are soaked in brine can contain good bacteria. The simple practice which was traditionally followed by soaking leftover rice in water and by consuming it on empty stomach early morning next day was a very economical and simple way to add good bacteria in daily diet.

Early consumption of good bacteria or probiotics lowers inflammation. So this way good bacteria or probiotics can improve exercise recovery, improve mood and also exercise performance. Also for those athletes who have gastrointestinal issue or have GI issues like loose rule when they travel during tournament or due to anxiety can consume probiotic foods or even a probiotic supplement that can ease these symptoms. Collection of probiotic foods and supplements also can lower diarrhea which can be induced by antibiotic intake. If you remember in the vitamin chapter when I emphatically talked about vitamin D not only being important for musculoskeletal health but this hormone plays a very important role as an immune modulator.

From better exercise recovery to having more muscle mass, lowering blood sugars to keeping you happy and upbeat vitamin D has a direct impact on immune function and vitamin D is very difficult to get only from food. Even exposure to daylight when the UVB rays are higher between 10 and 12 pm can sometimes not lead to optimal complicated formation of vitamin D in the skin, liver and kidney because the carbon particles of the automobile exhaust can deflect the UVB rays and hence in urban cities vitamin D can be a pandemic by itself especially in athletes or individuals with higher training load or duration it's important to address vitamin D deficiency that way athletes can ensure better sports performance. I cannot emphasize enough of how the simple process of sleeping through the night can influence immunity. In the recent chapter I discussed about going to bed on time when growth hormone releases midnight and for recovery from exercise for the repairing and rebuilding of the muscles to taking care of optimal growth in young children growth hormone can take care of many functions sound sleep lowers cortisol the stress hormone and also the appetite stimulating hormone called ghrelin helping weight loss. Practicing breathing pranayama and other yoga or asanas is not only important for movement and flexibility yoga and meditation techniques can improve mindfulness focus attention and cognitive abilities and while we focus to optimize the intake of foods which can support gut health and immunity it is equally important to

moderate and restrict indulgences in alcohol excessive consumption of processed food or white sugar and smoking that can lead to inflammation.

To summarize adequate intake of energy carbohydrates fats the good fats such as omega-3 a rich diet with colored fruits vegetables dark green leafy vegetables can uphold immunity a varied fiber rich diet can support the growth of good bacteria thereby improving gut health which can improve immune function. Optimal gut health can lower upper respiratory tract infections in athletes with high training load. I hope this lecture could give you at least a few new takeaways and I appreciate your patience and thank you for listening. Hi my name is Nina Venkatesh I'm an international swimmer I just participated at the Asian Games last year in China I've been swimming for quite a while now and I've realized that it's not just about the sport and the effort you put in in the water it's about everything that you do on a daily basis especially nutrition it played a very big role for me to elevate my game in the sport I never took care of my diet whatsoever but once I met Gita ma'am I realized how important nutrition is and it was the key factor that I was missing in my career more specifically on gut health. Gut health is the foundation for everything your mental health and your physical health a very strong immune system healthy sleep improved mood and the list goes on and as I said I've realized that it's the little things you do every day that help you in the long run it's not just the work you put in as an athlete is not just the work you put in in the sport but everything else from the gym to your nutrition to your sleep and your physios the list goes on and on.

Gut health is extremely important if that is not healthy then as I said it's the foundation for everything then your overall health as a human being wouldn't be healthy either.