Lecture 51:

Post – Exercise Exhaustion

Post – Exercise Proteinuria

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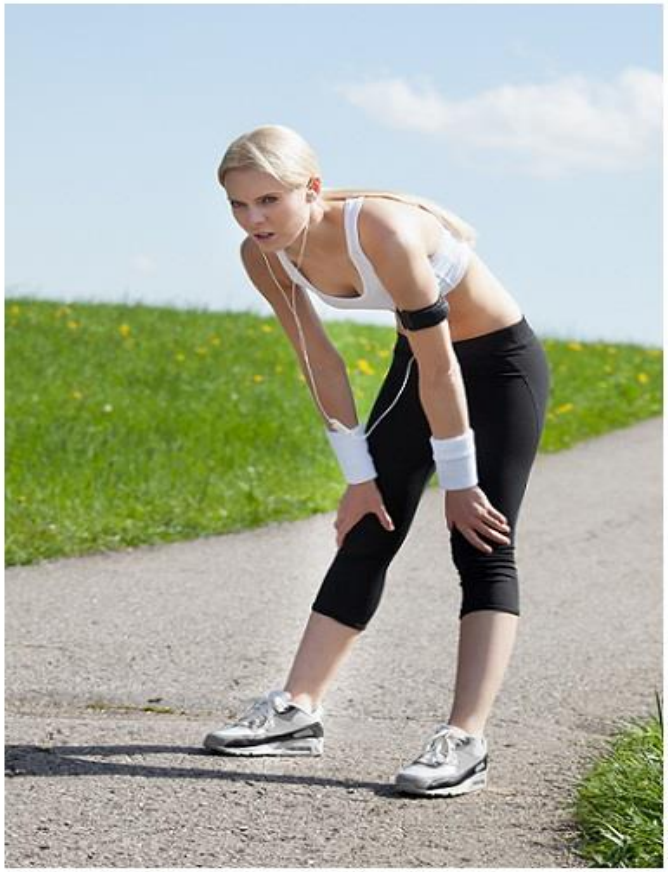
Post – Exercise Exhaustion:

- **Severe muscle weakness and exhaustion after a competition or a training session - which is inconsistent with intensity and volume of competition or training - is called post – exercise exhaustion (PEE).**

It is characterized by:

- **severe exhaustion after exercise or competition.**
- **lack of energy**
- **decreased muscular tonicity.**
- **muscle cramps especially in the calves.**
- **lack of interest in doing other chores.**
- **loss of interest in next training session.**
- **muscle soreness.**



Potential causes of PEE:

- 1) Decreased potassium level in the muscles.
- 2) Rhabdomyolysis followed by a sudden increase in potassium level.
- 3) Overtraining syndrome.
- 4) L – Carnitine deficiency.
- 5) Magnesium deficiency.

Potential risk factors for developing PEE:

- 1) Newly joined members of a fitness clubs (new Gym-goers).
- 2) Vegans and vegetarians.
- 3) Elite athletes who train hard to get ready for a competition.
- 4) Those who suffer from a chronic diarrhea.
- 5) Those who inadequately recuperate from their previous training sessions or competition.
- 6) Caffeine consumers: caffeine depletes potassium from the body.

- 7) High doses of vitamin B12 and folic acid.
- 8) Laxative abuse.
- 9) Licorice ingestion.
- 10) Medical conditions:
- - hypokalemic periodic paralysis.
- - Cushing`s syndrome.
- - anorexia nervosa.
- - hyperaldosteronism.
- - congenital adrenal hyperplasia.

- 11) **Medications:**
- a) **Insulin**
- b) **Diuretics.**
- c) **Antibiotics (penicillin, nafcillin, oxacillin, carbenicillin, and ticarcillin).**
- d) **Theophylline.**
- e) **Alpha – Blockers.**
- f) **Thyroid hormones.**

Nutritional Supports:

- a) Water: drink 2 – 3 liters a day and keep the body fully hydrated.
- b) Have sufficient complex carbohydrate before training.
- c) Consume foods high in potassium: sweet potato, banana, dried apricots, and spinach.

- **d) Avoid having caffeine before exercise.**
- **e) Magnesium: 200 – 400 mg daily.**
- **f) L – Carnitine: 2000 – 4000 mg daily.**
- **g) Potassium: 250 – 500 mg daily. *Caution:* if you are on medications for high blood pressure, dialysis, or suffering from kidney diseases, you should consume potassium under the supervision of your doctor.**

- **h) BCAA (branched-chain amino acid): 3 grams 30 minutes before training, 3 grams during training, and 5 grams within 30 minutes after training.**
- **i) Calcium: 1000 mg a day.**
- **j) Pyruvate: 5 – 10 grams a day.**
- **k) Adaptogens: take two of them as per your choice and availability.**
- **l) A high – quality Multivitamins-Multiminerals.**

Post – Exercise Proteinuria:

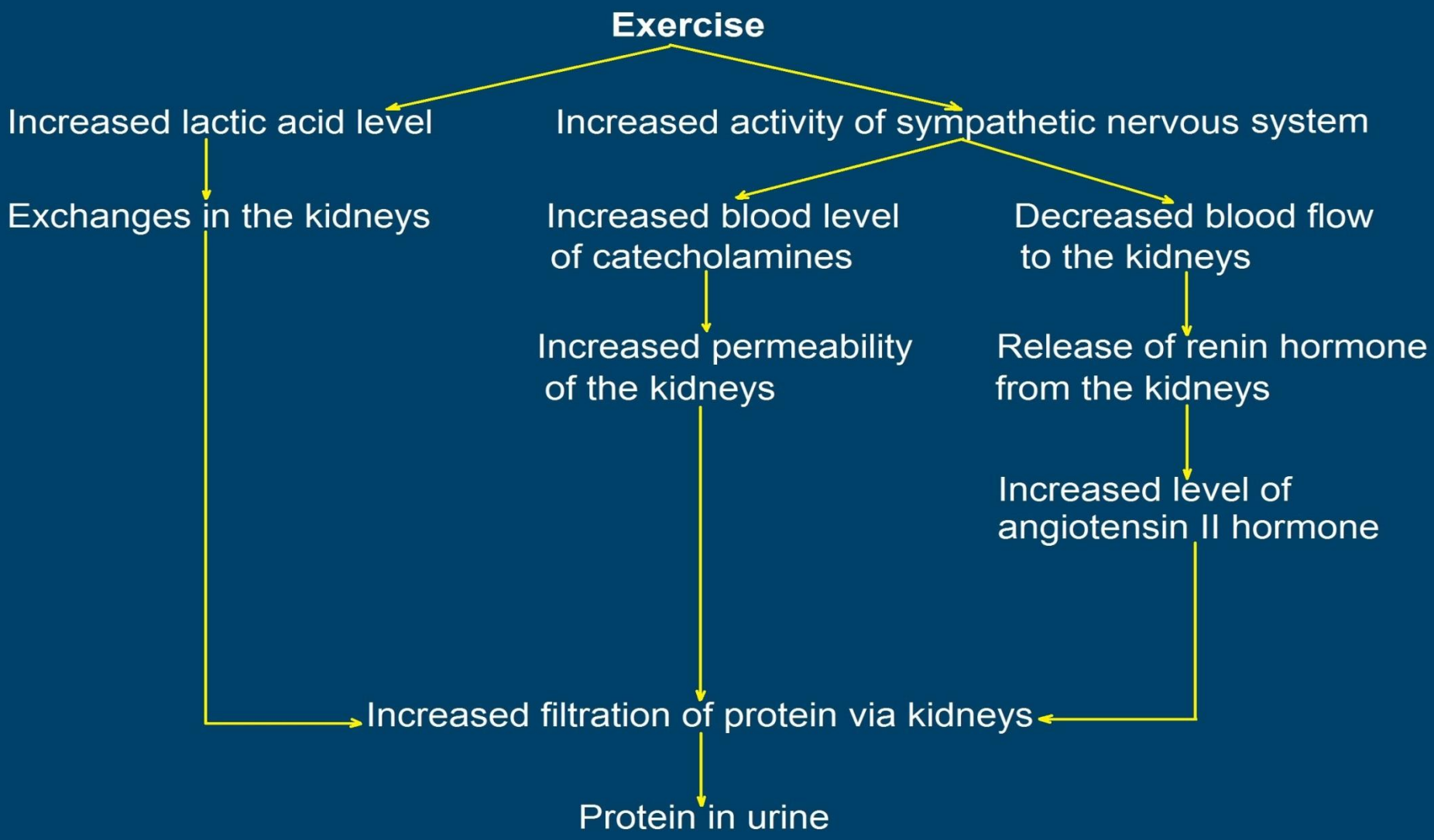
- A healthy person usually excretes up to 150 mg of protein per day through urine.
- The appearance of excess protein in urine especially after a strenuous training session is a common concern of many athletes and gym – goers.
- Post – exercise proteinuria (PEP) is generally a benign and transient condition that lasts 24 to 48 hours.

- **Post – exercise proteinuria is commonly seen among athletes involved in aerobic sports, such as runners, soccer players, cyclists, and swimmers.**

- **It is usually the result of the intensity of exercise rather than the duration.**

- **PEP is usually biphasic:**
- **The first phase of increased protein secretion is within 30 minutes after exercise. It is due to hemodynamic changes and saturation of renal tubules that lead to proteinuria.**
- **The second phase is about 24 hours after exercise and results from oxidative stress on renal glomeruli.**
- **PEP is considered a functional proteinuria and the exact mechanism is unknown. However, few theories have been suggested.**

Pathogenesis of Post - Exercise Proteinuria



Potential risk factors for PEP:

- a) Obesity.
- b) Acromegaly.
- c) Diabetes.
- d) Amyloidosis.
- e) Congestive heart failure.
- f) Fever.
- g) High blood pressure.

Management of PEP:

***PEP lasting more than 48 hours requires a medical attention*.**

- **The following athletic and nutritional advices may help with PEP:**
- **a) Reduce intensity of your exercise.**
- **b) Keep your body fully hydrated and drink 2 – 3 liters a day.**
- **c) Decrease your protein intake.**
- **d) Avoid alcohol and caffeine.**

- **e) Follow an alkaline diet.**
- **f) Increase taking lime, lemon, citrus fruits, and vinegar.**

- **According to few studies, not only does not creatine supplementation increase PEP, but also may decrease it by reducing lactic acid buildup.**

Homework:

- 1) Describe the risk factors potentiating post – exercise exhaustion.

- 2) Describe your approach to post – exercise proteinuria.