LOOKING DEEPER ON URINE FORMATION

by:
Rowena V. Cabrera
Master Teacher I, Limay Senior High School

Filtration and Reabsorption: These are the stages that our urine undergoes through the nephrons. In the first one, which is filtration, the useful substances of our bodies and the wastes are removed from the blood. While in the stage of reabsorption, the useful substances will reenter our blood for filling the needs of our body. And to know them more, let us discuss them separately.

The first stage, filtration, happens in the Bowman's capsule and glomeruli. There, our blood will enter the glomerulus under pressure. This pressure forces our filtrates (including the urea, water, glucose, amino acids, and salts) through the walls of our glomerulus, which are narrow into the Bowman's capsule. Our kidneys release one hundred eighty liters of filtrate every 24 hours. On the other hand, Graham (2021) stated that, "Our kidneys only eliminate a maximum of 1500 ml of urine a day." This happens because our bodies need to retain some of the water that we can still use together with the helpful nutrients and salts from the water. If our kidneys let them banish, our bodies will be at risk.

In reabsorption, this second stage will occur in our renal tubule after leaving the Bowman's capsule. In the process of reabsorption, as the name implies, it reduces the volume of filtrate while, yes, it sends back the essential substances to our blood. By doing this, 99 percent of water, salts, and amino acids, get back to us. And because of this reabsorption, the substances that will remain in our filtrates will be so concentrated. Our blood is reabsorbing the substances by the capillaries that surround our tubules. This reabsorption process is so crucial in us as a means of conserving the water in our bodies.

The glucose, osmosis, salts, and amino acids need active transport for them to get back. To do this, the energy for this active transport called ATP is supported by our mitochondria which can be found in the cells of our renal tubules. The microvilli, which significantly boost the surface area where reabsorption happens, are lined with the tubules. When this enlargement of the site occurs, a tremendous amount of water and substances will be enough for the stage of reabsorption.

References:

Lumen Anatomy and Physiology. Physiology of Urine Formation. https://courses.lumenlearning.com/nemcc-ap/chapter/physiology-of-urine-formation/. Retrieved July 31, 2020

Graham, J. The formation of Urine. Jama Internal Medicine. September 20, 2021.