Glomerular Filtration

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The kidney is a vital organ of the human excretory system, involved in the filtration of blood and the formation of urine (Field, Harris, & Pollock, 2010). It comprises of special internal structures which help it perform these function. These structures are called nephrons which consist of several components such as glomerulus, proximal and distal convoluted tubule, a loop of Henle, collecting duct, and associated capillaries. The glomerulus is the main part involved in the filtration of blood plasma (Tryggvason & Wartiovaara, 2005). Now the question is, how is it achieved? It is achieved through the process of Glomerular Filtration which is a first step in the formation of urine (Tryggvason & Wartiovaara, 2005). To know the process, we first have to understand the structure of Glomerulus.

 Various capillaries are intertwined in a cluster to form the structure of glomerulus (Field et al., 2010). Blood enters into the capillaries via efferent arterioles. The glomerulus is surrounded by the cup-shaped structure called Glomerulus capsule which is composed of two layers of squamous epithelial cells: inner visceral and outer parietal. The outer visceral layer is made up of podocytes that act as a slit allowing the filtrate to pass through. This slit is highly specialized and allows the transport of selective molecules such as mineral ions and inhibits the movement of large molecules and cells such as albumin, red blood cells, and platelets. At the other end of the glomerulus, efferent arterioles are present through which the glomerular filtrate leaves and enters into the proximal convoluted tubules where it is reabsorbed into the blood.

 Now, let me tell you about the mechanism through which this glomerular filtration occurs. It takes place via the process of renal ultrafiltration (Field et al., 2010). The blood vessels present in the glomerulus exert hydrostatic pressure which acts as a force to drive the movement of filtrate out of capillaries into the slits. The difference between the hydrostatic pressure and Osmotic pressure determines the glomerular filtration rate which is a rate at which the filtration occurs (Field et al., 2010).

References

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