Potassium (K^+)

- Vital for proper cell function, particularly in the heart and muscles.
- Helps move nutrients into cells and supports metabolism.

Potassium predominantly functions as an intracellular ion. The sodium-potassium adenosine triphosphatase pump plays a crucial role in maintaining the balance between sodium and potassium by extruding sodium in exchange for potassium, which enters the cells. In the kidneys, potassium filtration occurs at the glomerulus, while reabsorption takes place in the proximal convoluted tubule and the thick ascending limb of the loop of Henle.[1] Potassium secretion is facilitated in the distal convoluted tubule, with aldosterone enhancing this process. Additionally, potassium channels and potassium-chloride cotransporters located at the apical membrane of the tubules contribute to potassium secretion.[2] Imbalances in potassium levels can lead to cardiac arrhythmias. Hypokalemia is defined as serum potassium levels falling below 3.6 mmol/L, and its symptoms may include weakness, fatigue, and muscle twitching.[3] Hypokalemic paralysis, characterized by generalized muscle weakness, can occur in both familial and sporadic forms. Conversely, hyperkalemia is identified when serum potassium levels exceed 5.5 mmol/L, potentially leading to arrhythmias. Symptoms of hyperkalemia may include muscle cramps, muscle weakness, rhabdomyolysis, and myoglobinuria.[4]

References

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