Acid-Base Balance

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The human body has to balance acid-base inside the body to maintain pH. Physiological adaptations are been employed by the human body to maintain homeostasis. The average pH for optimal functions of the body is 7.35 to 7.45. According to various research studies, it has been observed that the human body works best in this pH. The biological processes such as oxygenation of the blood and biochemical reactions require an average pH of 7.40 for the functioning (Nagami & Hamm, 2017). It has been suggested that biochemical metabolites often get interrupted at neutral pH. The human body has experienced various kinds of acid-base anomalies due to incorrect balance. It includes metabolic alkalosis, respiratory acidosis, metabolic acidosis and alkalosis of the respiratory tract. To balance the state, the human body counterbalances the acid-base in the opposite condition. For instance, if metabolic acidemia occurs, then the body induces a process of alkalosis of the respiratory tract to neutralize the condition. To compensate for the acid-base balance, the pH of the body is neutralized as a result of a counterbalance reaction to 7.4.

Urine is a by-product of the body released by kidneys via a process of urination. Urine is produced to balance the nutrients and pH of the body. It is composed of organic and inorganic constituents mainly toxic (Chen et al., 2019). Abnormal constituents in the urine indicate conditions of disorders. For example, the presence of proteins in the urine refers to proteinuria (Nagami & Hamm, 2017). Normal constituents of the urine are sodium 1.17 g/L, creatinine 0.670 g/L, chloride 1.87 g/L, urea 9.3 g/L and potassium 0.750 g/L. other constituents are organic and inorganic hormones, metabolites and proteins (Nagami & Hamm, 2017). Certain infections and conditions of the kidneys alter the quantity of constituents of urine and as a result, malfunctioning occurs that caused diseases.

The human body is adapted to balance the concentration of urine volume through processes and hormones of the body. The major hormone to balance the composition of the urine is an antidiuretic hormone. It is a hormone secreted by the posterior pituitary gland and it increases the absorption of water in the kidneys. When plasma osmolality increases, the antidiuretic hormone is produced by the posterior pituitary gland and the signals are sent via osmoreceptors (Nagami & Hamm, 2017). In turn, osmolality is decreased and urine volume is also decreased. Some commonly consumed diuretic ingredients are caffeine, water, alcohol, and certain medications.

Certain abnormal conditions of the body that occurred as a result of an imbalance of metabolites such as oliguria is an abnormal condition in which the amount of urine is decreased due to kidney damage. Hematuria is a condition in which kidney excrete red blood cells in the urine. A higher level of glucose is excreted in the urine due to a higher level of glucose and is usually occurs in diabetic patients. For example, any shock or damage to the kidney may alter the functioning of the antidiuretic hormone and the absorption of water is disturbed by the urine. In many circumstances the amount of sodium and potassium is also disturbed in water is absorbed significantly by the kidneys (Chen et al., 2019). Metabolic disorders such as diabetes, polyuria, and dehydration are some conditions that are the result of metabolites imbalance by the kidneys. Certain genetic disorders or biological malfunctioning can also result in metabolic disorders. For example, Nephrogenic diabetes insipidus affects levels of antidiuretic hormone in the body. Therefore, the human body and its metabolites work optimally if the constituents and metabolites are in balance (Chen et al., 2019). The functions and physiological processes disturbed even as a result of minor changes in the metabolites in the blood because blood functions as a buffer to balance the constituents of metabolites in the body.

# References

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