American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 09 PAGES: 54-57
OCLC – 1121105677
Crossref doi Google Scholar WorldCat MENDELEY

Publisher: Oscar Publishing Services

Journal Website: https://theusajournals.com/index.php/ajbspi

Research Article

BIOCHEMICAL CHARACTERISTICS OF RAT SALIVA UNDER CONDITIONS OF DYSBACTERIOSIS

Submission Date: Sep 20, 2024, **Accepted Date:** Sep 25, 2024,
Published Date: Sep 30, 2024
Crossref doi: https://doi.org/10.37547/ajbspi/Volume04Issue09-05

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ABSTRACT

Dysbiosis is a condition characterized by the disruption of the normal ratio of microorganisms in the body, which can lead to various physiological disorders. This study investigates the biochemical changes in the saliva of rats under dysbiosis induced by antibiotics. A comparative analysis of the control and experimental groups revealed significant alterations in the levels of albumin, immunoglobulin IgA, electrolytes, and organic acids. The results indicate that dysbiosis leads to an increase in the levels of albumin and electrolytes, as well as a decrease in immunoglobulin IgA, suggesting potential impairments in immune response and metabolism. The findings underscore the importance of maintaining normal microbiota for health and may serve as a foundation for further research in the prevention and treatment of dysbiosis.

KEYWORDS

Dysbacteriosis, Saliva, Rats, Biochemical changes, Albumin, ImmunoglobulinIgA, Electrolytes, Organic acids, Antibiotics, Microbiota, Digestion, Immune response, Inflammation, Metabolism, Homeostasis.

INTRODUCTION

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Dysbacteriosis is a condition characterized by a disruption of the normal ratio of microorganisms in the body, which can lead to various physiological disorders. This condition is most often associated with a change in the composition of the intestinal microflora, which negatively affects metabolism and immune function. Saliva plays an important role in the processes of digestion and protection of the body, as it contains enzymes, antibodies and other components responsible for maintaining homeostasis. Studying biochemical changes in the composition of saliva in rats with dysbacteriosis can provide important data on the mechanisms underlying this condition, as well as its impact on the overall health of animals.

Purpose of the study

The aim of this study is to investigate the biochemical changes in the saliva composition of rats with antibiotic-induced dysbacteriosis. The study aims to identify changes in the levels of key salivary components such as albumin, immunoglobulin IgA , electrolytes and organic acids, and to understand the impact of dysbacteriosis on physiological functions of the body.

METHODS

Wistar rats were used for the experiment, divided into two groups: control and experimental. The experimental group received ampicillin for two weeks, which led to the suppression of normal microflora. Saliva was collected using a non-invasive method based on stimulation of salivation. Spectrophotometry and chromatography were used for analysis, allowing the concentration of proteins, electrolytes and organic acids to be determined.

RESULTS AND DISCUSSION

The results of the study showed significant changes in the biochemical composition of the saliva of rats with dysbacteriosis.

1. Changes in protein levels:

Albumin concentration increased by 30% in the experimental group compared to the control. This may indicate inflammatory processes and the body's systemic response to microbiota disruption. The level of immunoglobulin IgA decreased by 40%, indicating a decrease in the local immune response and potential vulnerability to infections.

2. Electrolyte composition:

Sodium and potassium levels increased by 25% in the experimental group, which may reflect changes in water and electrolyte balance. Calcium levels decreased by 15%, which may be associated with metabolic and intestinal dysfunction.

3. Organic acids:

Lactate levels increased by 20%, which may indicate metabolic changes and increased glycolysis under stress conditions. These changes in saliva composition may have a significant impact on digestion and the body's defenses.

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Table 1

Indicator	Control group	Experimental group	Change (%)
Albumin level (g/L)	30	39	+30%
Immunoglobulin IgA (g/l)	1.5	0.9	-40%
Sodium (mM)	140	175	+25%
Potassium (mM)	4.5	5.6	+25%
Calcium (mM)	2.5	2.1	-15%
Lactate (mM)	1.2	1.4	+20%

The obtained results show that dysbacteriosis causes significant biochemical changes in the composition of rat saliva. Increased levels of albumin and electrolytes may be associated with activation of inflammatory systems and stress reactions. A decrease in IgA indicates a weakening of the local immune response, which may increase the risks of infectious diseases and aggravate the consequences of dysbacteriosis.

It is also worth noting that changes in the level of organic acids, such as lactate, may indicate a metabolic disorder associated with changes in the microbiota. Lactate is a product of anaerobic metabolism and can accumulate under conditions of hypoxia or other metabolic disorders.

It should also be mentioned that saliva has many functions, including participation in the initial stages of digestion, protection of teeth and mucous membranes, and participation in the immune response. Changes in the composition of saliva may indicate the need for the body to adapt to new conditions and may be important markers of the health of animals.

CONCLUSION

The study revealed significant biochemical changes in the composition of rat saliva during dysbacteriosis. These changes emphasize the importance of normal microflora for maintaining health and homeostasis of the body. The data obtained may be useful for

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developing methods for the prevention and treatment of dysbacteriosis in both animals and humans. Further research is needed to more fully understand the mechanisms underlying dysbacteriosis and its impact on various physiological systems.

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