شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

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HANAA ALY

Histological and Immunohistochemical Study on The Protective Role of Propolis on the Spleen of The Physically Stressed Rats

Thesis

Submitted for Partial Fulfillment of Master's Degree in Histology and Cell Biology

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Abstract

Introduction:

Stress is a generic term that summarizes how psychosocial and environmental factors influence physical and mental well-being. The effects of stress on the immune system are complex and depend on the nature and duration of stress. Recently, the attention of researchers has been attracted to the use of propolis in many therapeutic fields including protection of the body from the effect of stress.

Aim of the work: To study the effect of immobilization stress on the structure of spleen of restrained rats and the protective role of propolis.

Materials and methods:

Thirty-two male rats (6-8) weeks old were used in this study. The animals were randomly divided to 4 groups, as follows: Group I (Control group), Group II in which rats were treated daily with propolis (3g/kg) by gavage for 10 days. Group III (stress group): in which rats were subjected to restraint stress test 2h/day for 10 days. Group IV (stress group with propolis):in which rats underwent the restraint stress test as in group III and were treated daily with propolis (3g/kg) one hour before the start of the immobilization. At the end of experiment all animals were sacrificed; spleen specimens were collected from all rats and were subjected to microscopic &immunohistochemical studies. Histomorphometry study and statistical analysis were also done.

Results:

Compared to group I, some specimens of group III showed atrophy of spleen with significance decrease in surface area of PALS & CD3 +ve cells immune reaction. These results were accompanied by significant decrease in surface area of the follicle with apparent decrease in CD20 +ve B lymphocytes immune reactivity. Moreover, apparent increase in CD68 immune reactivity in white pulp was recorded. Other specimens revaled thickened fibrosed splenic capsule and septa, widening and congestion of splenic sinusoid and prominent hemosiderin laden macrophage.

Meanwhile group IV showed general improvement in spleen architecture with daily propolis intake.

Conclusion:

Propolis is effective as a protective measure against the effect of restrained stress on spleen in adult rats.

Key words:

Spleen, Propolis, Restraint stress, Rats, Immunohistochemical study.

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List of Abbreviations

Abb.	Full-term
ANOVA	One-way analysis of variance.
H&E	Haematoxylin and eosin.
IL-6	Interleukin-6.
MZMQ	.Marginal zone macrophages.
MAP	Mean arterial pressure.
MMM	Metalophlic macrophages.
NKT	Natural killer T cells.
PALS	Periarteriolar lymphatic sheaths.
RBC	Red blood cells.
RPMQ	Red pulp macrophages.
SPSS	Statistical Package for the Social Sciences.
TEM	Transmission electron microscopy.
WBC	White blood cells.
WP	The white pulp.
FDC	Follicular dendritic cell.

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INTRODUCTION

Stress is a generic term that summarizes how psychosocial and environmental factors influence physical and mental well-being. The interaction between stress and immunity has been widely investigated, involving the neuroendocrine system and several organs **(Fabiane et al., 2017).**

The effects of stress on the immune system are complex and depend on the nature and duration of stress and the type of leukocytes **(Daniel et al., 2018).**

As the largest peripheral lymphatic organ, the spleen contains about one-fourth of the body's lymphocytes and initiates immune responses. The initiation of immune response is charged to the white pulp which surrounds the central arterioles and is densely populated with lymphocytes **(Huidan et al., 2016).**

Since prehistoric times, humans have used natural products, such as plants, animals, microorganisms, and marine organisms, in medicines to alleviate and treat diseases **(Shi et al., 2010).**

Propolis is composed of pollen, exudates of trees mixed with enzymes, and beeswax inside honeybees. This substance is

used by bees to fill gaps, cover hive walls and mummify the carcasses of external invader insects **(Nurbani et al., 201٧).**

Honeybee products have a long medicinal history. All cultures have folk medicine traditions that include the use of honeybee products, that is, honey, bee pollen, propolis, royal jelly, beeswax, and bee venom. These products have been found to exhibit anti-inflammatory, anti-bacterial, antifungal, antiviral, and antioxidant activities. It has been also shown that natural honeybee products inhibit tumor cell growth and metastasis and induce apoptosis of cancer cells. Hence, these bioactive natural products may prove to be useful in cancer therapy **(José et al., 2017).**