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شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



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شبكة المعلومات الجامعية

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**ULTRASTRUCTURAL STUDY OF THE EFFECT
OF CYCLOSPORINE A ON PANCREAS
OF ALBINO RAT**

THESIS

*Submitted for the Partial Fulfillment of the requirements
of the M.D. Degree*

In

Basic Medical Science (Histology)

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**FACULTY OF MEDICINE
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2003

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17926

ACKNOWLEDGEMENT

*First of all and above all great thanks to **ALLAH***

*I would like to express my deepest gratitude and thanks to my Prof. Dr. **Nadia Fouad Hassan** Prof. and Head of Histology, Faculty of Medicine, Tanta University for her kind support, continous encouragement, valuable suggestions, endless help and interest in the progress and performance of this work. Indeed this work is the outcome of her great and continous effort.*

*I am particularly indebted to my kind guide Prof. Dr. **Abd El- moneim Zamzam** Prof. of Histology, Former Dean of Faculty of Medicine, Tanta University for his close observation, generous guidance, valuable supervision and great support. he sacrificed a good deal of his time for accomplishment of this work.*

*I am also indebted to my kind guide **Dr. Kawther Abass El- Mehy** Ass. Prof. of Histology for her great support, endless help and effort in performance of this work. Indeed this work is the result of her great and continous help and encouragement.*

To all the staff memebers of Histology Department, Faculty of Medicine, Tanta University, I wish to express my full thanks .

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INTRODUCTION

INTRODUCTION

In the last decades, organ and tissue transplantation operations have been in success in Egypt, since cyclosporin began to be included in immunosuppressive protocols. Cyclosporin A (cyclosporin, cyclosporine, sandimmune) is a powerful immunosuppressive agent of fungal origin. and its main effect is directed to the helper T-cells (*Miach, 1986 and Holt et al., 1994*).

Although cyclosporin has been indispensable as an immunosuppressive agent after organ transplantation, it is known to have a number of potentially serious side effects. These side effects included renal and hepatic dysfunction, hypertension, neurotoxicity, lymphoma, abnormal glucose homeostasis and gingival hypertrophy (*Kahn, 1989 and Ferns et al., 1990*).

Pancreas is one of the most important and complex organs in the body. The exocrine part of the pancreas secretes enzymes that affect the digestion and absorption of nutrients. while the endocrine part releases hormones that regulate the metabolism of the breakdown products of food within the body (*Zamzam & Hassan 2000*).

In this study we will evaluate the side effects of cyclosporin A on different cell components of the pancreas, which is considered as one of the most vital organs in the body.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

ANATOMY OF THE PANCREAS

Pancreas is a fleshy soft lobulated gland which lies transversely across the posterior abdominal wall at the level of the first and second lumbar vertebrae, extending from duodenum to spleen. It is formed from head, body and tail (*Sahana, 1969*).

The head of the pancreas is the broadest part which is moulded in and fills completely the concavity of the duodenum. The anterior surface of the head is hidden by the transverse colon, while the posterior surface is grooved by the inferior vena cava, the terminal parts of common bile duct and the renal veins. The neck, is extended upward, forward and to the left from the head and merged into the body. Its anterior surface which is related to the lesser sac and pylorus is covered by peritoneum while the posterior surface is related to the portal vein (*Williams, 1989*).

The body of the adult pancreas is prismoid in cross section from the right end of its superior border and gives rise to an upward projection called tuber omentale.

The body passes from the neck to the left slopping upwards. The concave anterior surface is covered by peritoneum and related to the lesser sac and its posterior surface is devoid of peritoneum and is related to the structures that form the

stomach bed. The tail, is narrow, usually reach the inferior part of the gastric surface of the spleen (*Douglas et al., 1984*).

Vascularization, lymph circulation and innervation of the pancreas:

As the pancreas develops at the junction between the foregut and the midgut, it takes its arterial supply from both guts. The neek, body and tail are supplied by splenic artery of the foregut while the head has a dual arterial supply, by the superior pancreatico-duodenal artery of the foregut and also by its inferior analogue comming from the arteries of the midgut. The pancreas also receives small branches from the hepatic artery (*Williams, 1989*).

The vessels pass in the interlobular connective tissue and give off branches that enter the lobules forming rich capillary networks among the acini and in the islets. The flow of blood through capillaries in both acinar and islet tissue is intermittent. Local blood flow through acinar capillaries is regulated by smooth muscle present in precapillary sphincters and also by endothelial sphincter. Capillary anastomosis were seen between the islets and the adjacent acinar tissue. The venous blood is drained either directly into portal vein or indirectly through the splenic vein and superior mesentric veins (*Fawcett, 1994*).

Lymphatics of the head of the pancreas pass along its arteries to the coeliac and preaortic lymph nodes. While that of the neck, body and tail pass to retropancreatic nodes. They are lined with endothelium (*Douglas et al., 1984*).

Many authors reported that the pancreatic acini and the islets of langerhans are innervated by unmyelinated nerve fibers that arised from the coeliac plexus. These fibers accompany the arteries into the gland and end around the acini. There are many sympathetic fibers in the interlobular connective tissue. Pancreas receives also myelinated fibers from the vagus nerves (parasympathetic) these fibers make synaptic contact with the acinar cells then ramify among the islet cells. This nervous connection of the pancreas play a role in regulation of pancreatic secretion (*Ronald et al., 1985 and Fawcett, 1997*).

SOME HISTOLOGICAL ASPECTS OF PANCREAS

Pancreas is a mixed gland that has an exocrine part and an endocrine part.

Histology of the exocrine pancreas :

The exocrine portion is a compound tubulo-alveolar gland. The acini of this gland are serous and their secretions are collected by a widely branching duct system (*Fawcett, 1997*).

The acini of the pancreas are pear shaped lined by tall columnar or pyramidal epithelial cells (*Johannes, 1984*). Each acinus consists of 40 to 50 cells in a single row around a narrow lumen surrounded by a basal lamina that is supported by reticular fibers from outside (*Richards, 1984*).

The cytoplasm of the acinar cells show prominent basal basophilla because the pancreatic exocrine cell is one of protein synthesizing cells rich in RNA. They show basal striations due to presence of mitochondria alternating with parallel arrays of cisternae of rough endoplasmic reticulum. The apical portion is crowded with acidophilic secretory granules, usually called zymogen granules containing many digestive pancreatic enzymes (protein in nature) and some neutral polysaccharides (PAS+ve) (*Caro & Palade, 1964 and Zamzam and Hassan, 2000*).

The pancreatic acinar cells are differentiated into two types: dark one and light one with no fixed pattern in the