XIVth FEDERATIVE INTERNATIONAL CONGRESS OF ANATOMY

76e CONGRES DE L'ASSOCIATION DES ANATOMISTES

NEW UNIVERSITY OF LISBON
FACULTY OF MEDICAL SCIENCES
Departments of Anatomy and of
Histology and Embriology

24th - 30th JULY 1994

LISBON - PORTUGAL

ABSTRACTS BOOK

EXPERIMENTAL DIABETES AND GLIAL CELLS IN THE OPTIC NERVE.

MOMPEO B., ORTEGA F., SARMIENTO L., PEREZ L.
Department of Morfology, University of Las Palmas de G.C. Spain

it is known that the glial cellular component of the central nervous system, above all, the astrocyte component suffer sustantial modifications as a result of certain aggressions and pathological processes. However, there are few studies which have investigated the modifications produced by the continous hyperglycaemia on the central nervous system. This together with the fact that the visual system is one of the first to be affected by hyperglycaemia led us to choose the optic nerve as substratum for study.

The ultrastructural studies of the optic nerve of spontaneously diabetic BB/W rats have revealed a reduction in the axonal size, together with a thickening of the basal lamina of the capillaries. However, we have found no clear reference to the behaviour of the glial cells in the optic nerve as a result of diabetes.

In our study a total number of 20 two-month old Sprague Dawley rats of equivalent weights was used to carry out the study. Diabetes was induced in half of these animals via an intraperitoneal injection of Streptozotocin in citrate buffer. The rest were injected with the buffer alone and were therefore used as the control group. The animals were sacrificed six weeks later. Sections of the right optic nerve were prepared for electron transmission microscopy. Semi-thin sections were used for the morphometrical cellular studies, and ultra-thin sections were used to ultrastructural analyses of the optic nerve.

Our results show a glial reaction in the optic nerve, which are found on the submeningeal surface and around the blood vessels, and presented in form of an astrocitic hipertrophy. We are able also observe how the macroglial cells (astrocytes and oligodendrocytes) play a role in eliminating mielinic waste, produced in the optic nerve by a degeneration of the myelinic sheaths of the nerve fibres as a efect of the hyperglycaemia.