



Int J Exp Pathol. 1998 Aug;79(4):207-22.

Deposition of advanced glycation end products (AGE) and expression of the receptor for AGE in cardiovascular tissue of the diabetic rat.

Sun M, Yokoyama M, Ishiwata T, Asano G.

Source

Department of Pathology, Nippon Medical School, Tokyo, Japan.

Abstract

Advanced glycation end products (AGE) in tissues are important for the central pathological features of diabetic complication. Although AGE bind to several cell-surface sites, resulting in altered cellular functions, receptor for AGE (RAGE) appears to have a central role. We examined AGE accumulation and RAGE expression in the aorta and heart of rats with streptozotocin (STZ)-induced diabetes, 0, 4, 8, 12, 16 and 24 weeks after STZ administration. Early atherosclerotic findings in the intima and medial thinning were observed in the aorta after 16 weeks of STZ-Induced diabetes. Immunohistochemistry and microscope spectrophotometry showed that AGE deposition increased significantly in the aorta and vessels of the myocardium, depending on the period of hyperglycaemia. RAGE was expressed in the endothelial cells and vascular smooth muscle cells of all animals. The number of smooth muscle cells with RAGE immunoreactivity increased until 12 weeks after STZ injection, and then decreased in rats with diabetes between 16 and 24 weeks. On the other hand, total RAGE mRNA levels in the aorta and heart continued to increase with the duration of hyperglycaemia. Furthermore, AGE-BSA induced RAGE mRNA expression of human umbilical vein endothelial cells in vitro. Taken together, the AGE accumulation might initiate diabetic macroangiopathy through RAGE, and the increase of RAGE expression by endothelial cells could be a reason that diabetes mellitus accelerates atherosclerosis rapidly.

PMID: 9797717 [PubMed - indexed for MEDLINE] PMCID: PMC3230864