

Calcium dynamics during fertilization in *C. elegans*

ABSTRACT

By creating a method to investigate calcium transients during fertilization, numerous experimental possibilities are presented, including identifying the signaling events that interfere with sperm binding and calcium elevation, determining their potential roles, such as completing meiosis, building the eggshell, and setting the symmetry axis of the embryo.

INTRODUCTION

Atherosclerosis is a prevalent condition that may result in death or disability caused by myocardial infarction or strokes. Although the clinical manifestations of the disease have been established, the mechanism of atherogenesis is still unclear. Recent research suggests that the oxidative modification of LDL (LDL-Ox) is one of its key processes involved. However, the biological effects of LDL-Ox have been largely untested in vivo. Given the potential clinical significance of the oxidative modification of these molecules, many studies have attempted to measure their susceptibility to oxidation in vitro (this measure is believed to correlate with the relative sensitivity of low-density lipoprotein (LDL) to oxygen and fatty acids within the arterial wall. Ultracentrifugation, chromatography, electrophoresis, and selective precipitation are among the options for identifying plasma LDLs. Lipid peroxidation is a complex process that involves the chain reaction of free radicals with polyunsaturated fatty acids. Rearrangements of double bonds in conjugated dienes, the generation of hydroperoxide, lipid breakdown into lower molecular weight fragments, and chemical changes in the apo B protein are all part of these reactions. The extent of fatty acid peroxidation can be estimated by measuring thiobarbituric reactive substances (TBARS), which is nonspecific but useful in purified systems. TBARS determination is primarily focused on measuring malondialdehyde (MDA) produced by hydroperoxidation of unsaturated fatty acids with three or more double bonds, and has been extensively studied to determine the role of Fe^{3+} , Fe^{2+} and Cu^{2+} in the oxidative stress domain of LDL; further reduction of oxygen in biological systems yields hydrogen peroxide and superoxide radical. The hydroxyl radical, which is the most reactive oxygen species with the shortest half life, is produced by the reaction between these two species. Catalytic amounts of iron or copper salts can accelerate this kinetically slow reaction. The authors present a straightforward technique for assessing the oxidative susceptibility of LDLs in the presence of Cu^{2+} and H_2O_2 in vivo by means of TBARS.

CONCLUSION

A controlled study on IA patients revealed a similar decrease in DHEAS secretion in RA, SpA, and UIA. The differences in DHEAS concentrations between patients and controls matched for age and sex, as well as previous glucocorticoid usage, current NSAID therapy, duration of disease, and insulin resistance, were attenuated in women and not in men. There should be further research into the role of low DHEAS concentrations in causing IA; more information about how they affect the pathogenesis is also needed, and the impact of poor health associated with such low levels of DHEA (DHEA-hydrogenated Euration Assembly as a Replacement) should also be considered.