ABSTRACT

During oocyte maturation, reactive oxygen species (ROS) are produced. Under physiological conditions, ROS have a signaling function, but when they accumulate, they deteriorate oocyte quality and reduce the chances of fertilization. ROS can cause both single- and double-strand breaks in DNA, incorrect base pairing during replication, and lipid peroxidation, which can lead to apoptosis. In addition to natural metabolic processes, the generation of ROS in the oocyte is influenced by several other factors, such as light in the laboratory, oxygen concentration and pH of the culture médium. ROS are removed by antioxidants (AOX), which act as electron donors, they reduce ROS and thus prevent oxidative stress (OS). AOX are divided into enzymatic (such as superoxide dismutase, catalase and glutathione peroxidase), which are produced in the human body, and non-enzymatic (such as vitamins C and E, glutathione and polyphenols), which are obtained from food, primarily from vegetables and fruits. The oocyte in the human body is a part of the oocyte-cumulus complex (COC), which produces AOX utilized by the oocyte. *In vitro* maturation of oocytes (IVM) is a laboratory technique used in assisted reproduction. Under IVM conditions a large amount of ROS is produced, leading to OS. By adding AOX to the culture of maturing oocytes, it is possible to improve their quality and chances of fertilization.