

# Abstract

Fertil Steril. 2006 Sep;86(3):503-12.

## Oxidative stress in an assisted reproductive techniques setting.

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**OBJECTIVE:** The manipulation of gametes and embryos in an in vitro environment when performing **assisted reproductive techniques (ART)** carries the risk of exposure of these cells to supraphysiological levels of reactive oxygen species (ROS). The main objective of this review is to provide ART personnel with all the necessary information regarding the development of oxidative stress in an ART setting, as well as the sources of ROS and the mechanisms of oxidative stress-induced damage during ART procedures. The impact of oxidative stress on ART outcome and the different strategies designed to prevent it are also discussed.

**DESIGN:** Review of international scientific literature. A question-and-answer format was adopted in an attempt to convey comprehensive information in a simple yet focused manner.

**RESULT:** **The pO<sub>2</sub> to which gametes and the embryo are normally exposed in vivo is significantly lower than in vitro.** This results in increased production of ROS. Increase in levels of ROS without a concomitant rise in antioxidant defenses leads to oxidative stress. Lipid, protein, and DNA damage have all been associated with oxidative stress. **This may ultimately result in suboptimal ART success rates.**

**CONCLUSION:** Many modifiable conditions exist in an ART setting that may aid in reducing the toxic effects of ROS.

PMID: 16860798

