Bovine spermatozoa a suitable cell model for pharmacological studies: Effects of some homeopathic drugs on mitochondrial activity and other important parameters of cells function

D.M. Aziz[1], U. Janowitz[2], U. Schnurrbusch[3] and H. Enbergs[1]

[1]Institute of Physiology, Biochemistry and Hygiene of Animals, Bonn University, [2]Rinder Union West, Borken, [3]Faculty of Veterinary Medicine, Leipzig

ABSTRACT

We used bovine spermatozoa as a cell model for our pharmacological studies because these cells are adult differentiated mammalian cells with all important cell elements. The potential user can get them from artificial insemination stations, where they are stored and kept alive for many years. In this study we tested the effect of 3 commercial homeopathic drugs (Ubichinon Comp.®, Coenzyme Comp.® and Selenium-Homaccord®, Heel, Baden-Baden, Germany) on mitochondrial activity flowcytometrically using Rhodamine 123. To evaluate the possible side effects of the tested drugs on the integrity of the cell membrane, the acrosome and chromatin structure, SYBR-14, Lyso Tracker Green DNA-20 and Acridene orange were used, respectively. Frozen semen from 10 bulls was prepared using routine diluents + homeopathic drugs in two concentrations: 1:9 and 1:4. Sperm mitochondrial activity was increased significantly ($P<0.05$) in the following groups: 1:9 Coenzyme Comp., 1:4 Ubichinon Comp., 1:9 and 1:4 Selenium-Homaccord. There were no side effects of these drugs on the above mentioned cell parameters. In conclusion, the tested homeopathic drugs can be used to stimulate the mitochondrial activity and therefore the oxidative energy metabolism of sperms and also of other mammalian cells. So sperm cells offer an innovative, very sensitive and promising supplement or alternative to the use of cell cultures and laboratory animals for pharmacological studies.