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# Effects of Hepatitis B virus S protein exposure on sperm membrane integrity and functions

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**Background:** Hepatitis B is a public health problem worldwide, but only scant information about the influence of hepatitis B virus (HBV) infection on sperm quality is available. The purpose of this study was to investigate the effect of HBV S protein (HBs) on human sperm membrane integrity and functions.

**Methods/Principal Findings:** Reactive oxygen species (ROS), lipid peroxidation (LP), total antioxidant capacity (TAC) and phosphatidylserine (PS) externalization were determined. The terminal deoxynucleotidyl transferase-mediated dUTP nick end labeling (TUNEL) assays and flow cytometric analyses were performed. (1) After 3 h incubation with 25 μg/ml of HBs, the average rates of ROS positive cells, annexin V–positive/ propidium iodide (PI)-negative cells, Caspases-3,-8,-9 positive cells and TUNEL-positive cells were significantly increased in the test groups as compared to those in the control groups, while TAC level was decreased when compared with the control. The level of malondialdehyde (MDA) in the sperm cells exposed to 50 μg/ml of HBs for 3 h was significantly higher than that in the control ($P<0.05$-$0.01$). (2) HBs increased the MDA levels and the numbers of ROS positive cells, annexin V–positive /PI-negative cells, caspases-3, -8, -9 positive cells and TUNEL-positive cells in a dose-dependent manner. (3) HBs monoclonal antibody (MAb) and N-Acetylcysteine (NAC) reduced the number of ROS-positive sperm cells. (4) HBs decreased the TAC levels in sperm cells in a dose-dependent manner.

**Conclusion:** HBs exposure could induce oxidative stress and apoptosis in sperm cells, resulting in loss of sperm membrane integrity and causing sperm dysfunctions.

## Biography

Professor Tianhua Huang and his group study on vertical transmission of infectious viruses via germ line for 19 years. He is the director of Research Center for Reproductive medicine of Shantou University Medical College, China. He has published more than 160 papers and won the second prize of the 7th Royan International Research Award in 2006. He is Deputy Secretary General of Chinese Environmental Mutagen Society and serves as an editorial board member of several academic journals.

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