Beilage zum diagnose:funk - Brennpunkt
Smartphones & Tablets schädigen Hoden, Spermien und Embryos

Schaubild aus De Iuliis/Aitken´(2009): Zusammenhang EMF und Spermienvitalität und -motiliät[1]

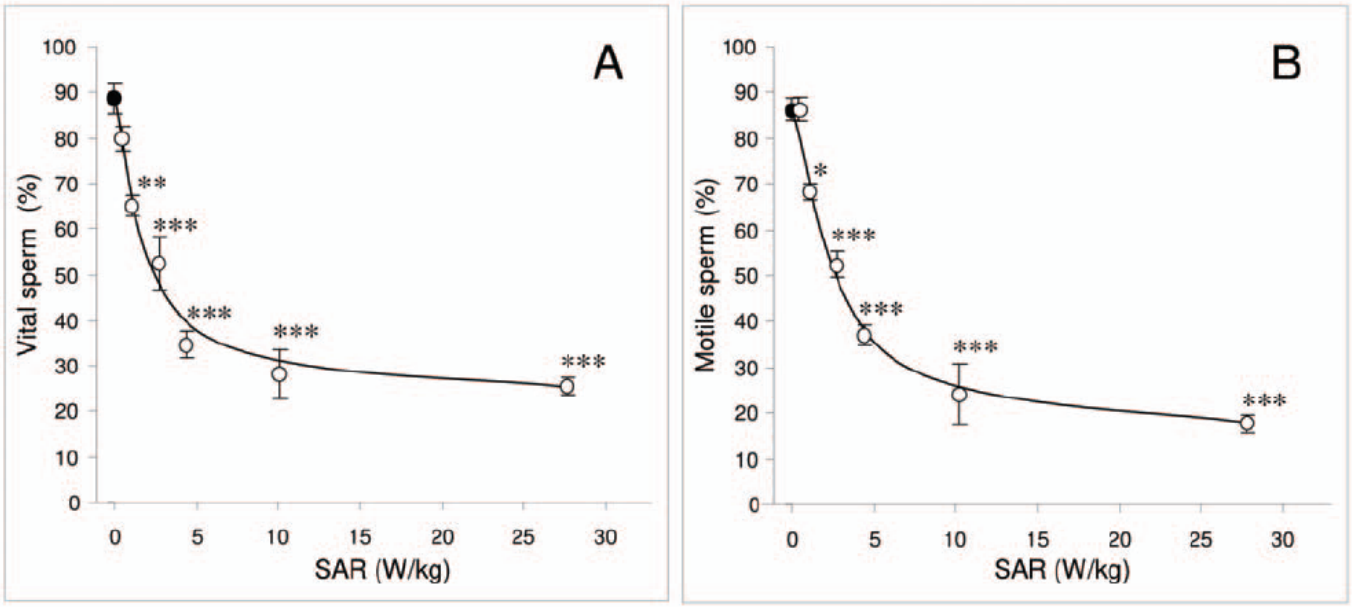

Figure 2. RF-EMR exposure reduces motility and vitality of human spermatozoa, in an SAR dependent manner. Percoll-purified spermatozoa (5×10^6 cells) were suspended in 1 ml BWW in a 35 mm Petri dish and placed within the waveguide while control cells (closed circles) were placed outside the waveguide. Cells in the waveguide were exposed to 1.8 GHz RF-EMR at SAR levels of 0.4, 1.0 2.8 4.3 10.1 and 27.5 W/kg (open circles) for 16 h at 21°C. Both vitality and motility were reduced in a dose dependent manner. **A,** Vitality was significantly reduced at a SAR of 1.0 W/kg from 89%±3% to 65%±1% (**p<0.01). **B,** Motility was also significantly reduced at a SAR of 1.0 W/kg from 86%±2% to 68%±2% (*p<0.05). All results are based on 4 independent samples.
doi:10.1371/journal.pone.0006446.g002

Schaubild aus De Iuliis / Aitken (2009): Zusammenhang EMF und DNA - Schädigung in Spermien[1]

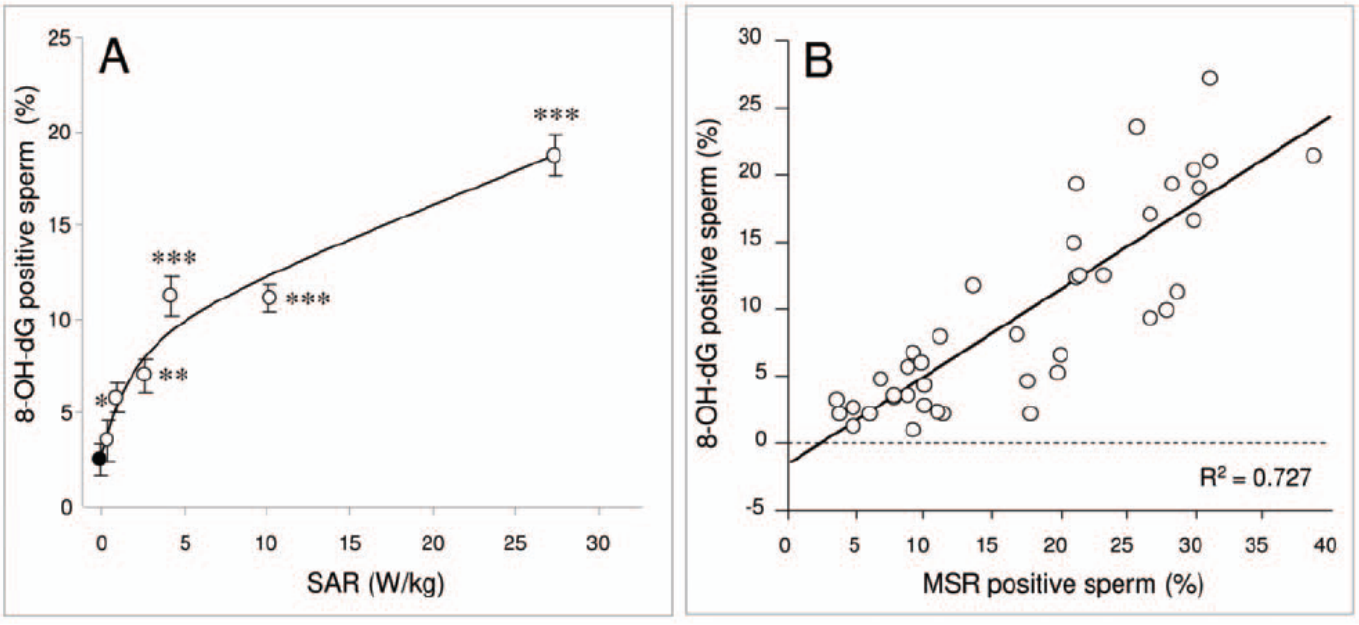

Figure 4. RF-EMR induces oxidative DNA damage in human spermatozoa. Following Percoll fractionation, 5×10^6 high density, spermatozoa were suspended in 1 ml BWW. The cells were placed in 35 mm Petri dishes and placed inside a waveguide. 5×10^6 cells in 1 ml BWW were placed outside the waveguide as a control (closed circle). The cells in the waveguide were exposed to 1.8 GHz RF-EMR at SAR levels between 0.4 and 27.5 W/kg (open circles) and all samples were incubated for 16 h at 21°C. Following incubation, Fe^{2+} and H_2O_2 was added to cells to act as a positive control, incubated for 1 h, then 100 µl 2 mM DTT/BWW solution was added and incubated for 45 min at 37°C. Cells were fixed and labeled with 100 µl charcoal purified anti-8-OH-dG, FITC tagged antibody at a dilution of 1:50, incubated at 21°C for 1 h, washed and then assessed by flow cytometry. **A,** As the power levels were increased, the amount of oxidative DNA damage expressed also increased. A significant amount of oxidative DNA damage was observed in cells exposed to 2.8 W/kg (*p<0.05) RF-EMR and above (**p<0.01; ***p<0.001). Results are based on 4 independent samples. **B,** The levels of 8-OH-dG expression were positively correlated with the levels of ROS generation by the mitochondria ($R^2=0.727$).
doi:10.1371/journal.pone.0006446.g004

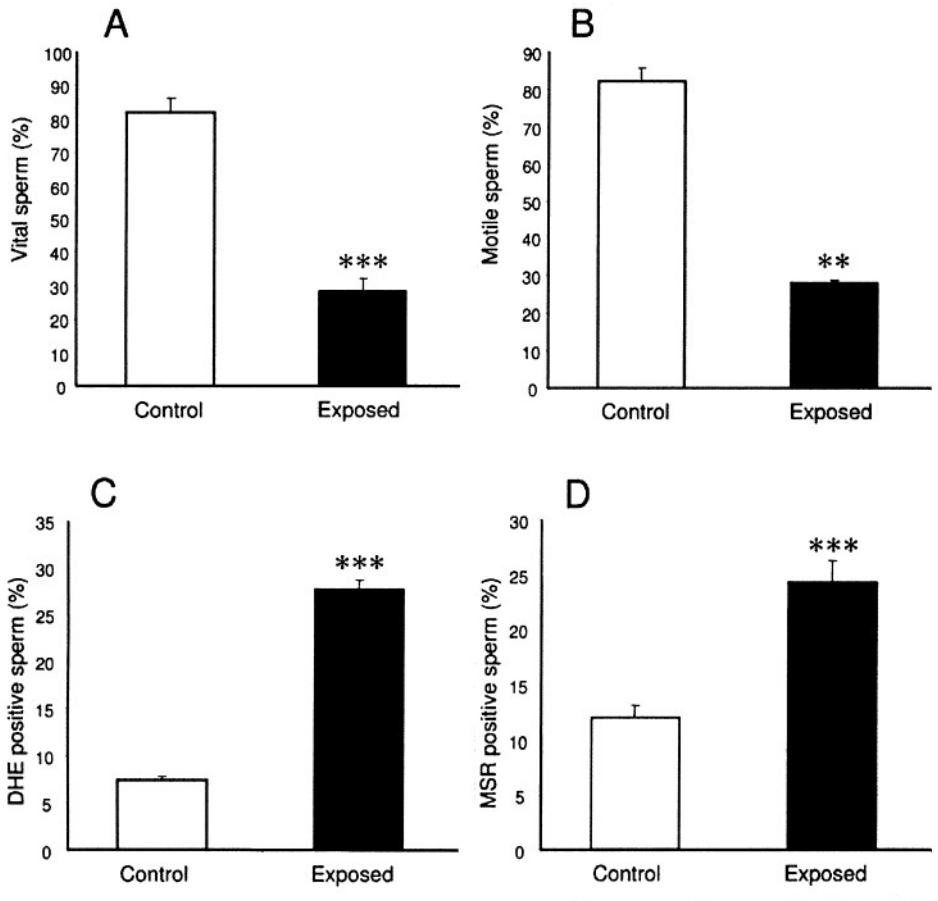

Schaubild aus De Iuliis / Aitken (2009): Zusammenhang zwischen EMF-Exposition und Spermienvitalität (A), Motiliät (B), ROS-Produktion (C), ROS - Produktion Mitochondrien (D)[1]

Figure 1. RF-EMR exposure decreases motility and vitality of human sperm while also inducing intracellular ROS. Percoll-purified spermatozoa (5×10^6 cells) were suspended in 1 ml BWW in a 35 mm Petri dish and placed within the waveguide while control cells placed outside the waveguide. A frequency of 1.8 GHz at a SAR of 27.5 W/kg was used and all samples were incubated for 16 h at 21°C. **A,** Sperm vitality was significantly reduced from the control value of 82%±4% to 29%±4% for the exposed cells (***$p<0.001$). **B,** Sperm motility was also significantly reduced from the control value of 82%±4% to 28%±1% (**$p<0.01$). **C,** ROS production was increased after RF-EMR exposure such that 28%±1% of the cells were producing ROS, while only 7%±0.4% of the controls contributed to ROS production (***$p<0.001$). **D,** 24%±1% of the exposed cells generated mitochondrial ROS, while the only 12%±1% of the control cells produced ROS from this source (***$p<0.001$). All results are based on 4 independent samples.
doi:10.1371/journal.pone.0006446.g001

Schaubild aus Agarwal(2011): Zusammenhang zwischen EMF - Exposition und Spermienmotilität[2]

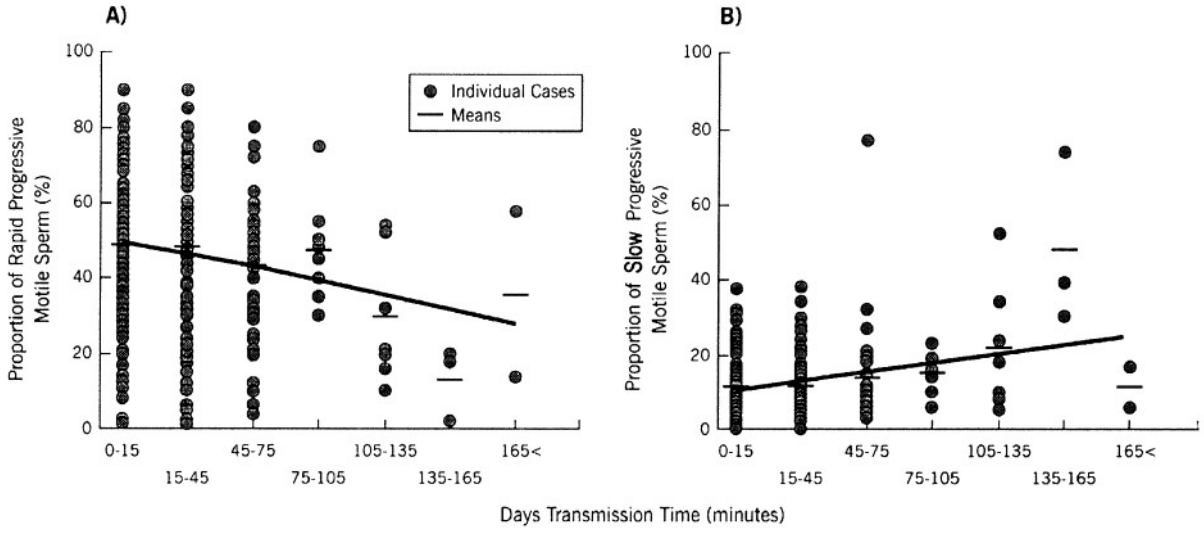

***Figure 2** - Cell Phone Usage and Sperm Motility.*

A. Increasing cell phone usage (in minutes) is inversely correlated with the percentage of rapid progressive motile sperm.
B. Increasing cell phone usage (in minutes) is correlated with an increase in slow progressive motile sperm. Adapted from Fejes 2005 (18).

Quellen: (1) De Iuliis GN, Newey RJ, King BV, Aitken RJ: Mobile phone radiation induces reactive oxygen species production and DNA damage in human spermatozoa in vitro, in: PLoS One 2009; 4 (7): e6446

(2) Agarwal A, Singh A, Hamada A, Kesari K; Cell Phones and Male Infertility: A Review of Recent Innovations in Technology and Consequences. Review, Int Braz J Urol 2011; 37 (4): 432 - 454