THE EFFECTS OF VIAGRA ON SPERM FUNCTION AND EARLY EMBRYO DEVELOPMENT

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In an audit of UK fertility units, we have demonstrated that 42% prescribe Viagra to aid patient semen production. Viagra is a phosphodiesterase inhibitor (PDE5) and as non-specific PDEs have been shown to affect fertility, safety concerns have been raised. The aims of this study are to investigate the effects of Viagra on sperm function and early embryo cleavage. Human semen was incubated with and without Viagra (450 ng/mL sildenafil citrate, equivalent to plasma concentrations after 100 mg oral dose; Pfizer, UK). Aliquots were also prepared by a 90/45% density centrifugation gradient to separate good and poor subpopulations. All samples were analysed by computer assisted semen analysis (HTM-IVOS) up to 60 and 120 min. Prepared samples were also labelled with fluorescein isothiocyanate–peanut agglutinin to determine acrosome status. Male mice were gavaged with Viagra (equivalent dose/body wt) and mated with superovulating females. Twenty females were sacrificed 12 h later, their oviducts flushed and viable fertilized oocytes counted. Another 20 females were sacrificed 4 days after mating and their embryo numbers and cleavage stages determined. Viagra increased % progressive motility in semen ($n = 22$) by 38%, VAP by 21%, VSL by 21% and VCL by 16% at 60 min (all P values <0.001). These effects were sustained at 120 min. Sperm isolated from 90% ($n = 57$) and 45% ($n = 15$) fractions showed similar increases. Viagra also increased the proportion of acrosome reacted sperm in the 90% (+79%, $P < 0.001$) and 45% (+77%, $P < 0.001$) fractions. Further, Viagra caused a reduction in both the numbers of fertilised oocytes (–35%, $P < 0.001$) and those reaching blastocyst stage (–85%, $P < 0.001$). This study demonstrates that Viagra increases human sperm motility. However, Viagra induces human premature acrosome reactions and impairs mouse fertilisation and embryo cleavage. This study raises significant concerns for its use in assisted reproduction.

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