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Glass transition temperature (T_g) as a measure of sperm fertility: Effect of antifertility drug nifedipine and its analogues

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Contraception being the need for the hour, we have synthesized few analogues of nifedipine, an L-type calcium channel blocker and evaluated their effects on sperm fertility. The glass transition temperature (T_g) of spermatozoa has been monitored to characterize the cellular damage due to aging or by external agents. We have shown that the T_g can be used as a marker to measure infertility caused by external agents. The cellular damage can be due to the cell immobilization or due to the membrane alteration ultimately leading to infertility. Results have been supported by measuring the cell motility, metabolism and lipid peroxidation; the well established markers for estimating the sperm fertility. Unlike D_4, nifedipine and analogue D_2 cause sperm cell aging by hampering the motility without causing the membrane damage. This indicates that the damage caused due to D_4 may be irreversible. Thus the present findings demonstrate that D_2 can be a promising candidate as a lead molecule for the development of reversible antifertility agents.

Biography

Sudha Srivastava has done PhD in chemistry from Tata Institute of Fundamental Research, Mumbai and is presently senior scientist, Manager, National Facility for High Field NMR, at TIFR, Mumbai. She is Fellow, National Academy of Sciences. Her major research areas are: NMR studies on intact cells, membrane architecture, drug-design, drug-DNA interactions, conformation and dynamics of bioactive peptides, proteins and hormones. She has more than 130 research publications in refereed journals and is serving as an editorial board member of repute.

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