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Stress of infertility: Can the couple cope?

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Madam, health impact of infertility has resulted in an aggravation of medical, social, psychological and economic burden of developing countries. Female partners in particular, suffer a lot with respect to their health, self-esteem self-assurance, personal control, genetic legacy and optimism in future. Infertile females specially living in joint family system tend to stay within themselves under such pressures and drift to a world of depression and stress. Stress has an impact on all systems of the body (Figure), however the effect of stress on pathogenesis of infertility and the precise casual mechanism has yet to be explored.

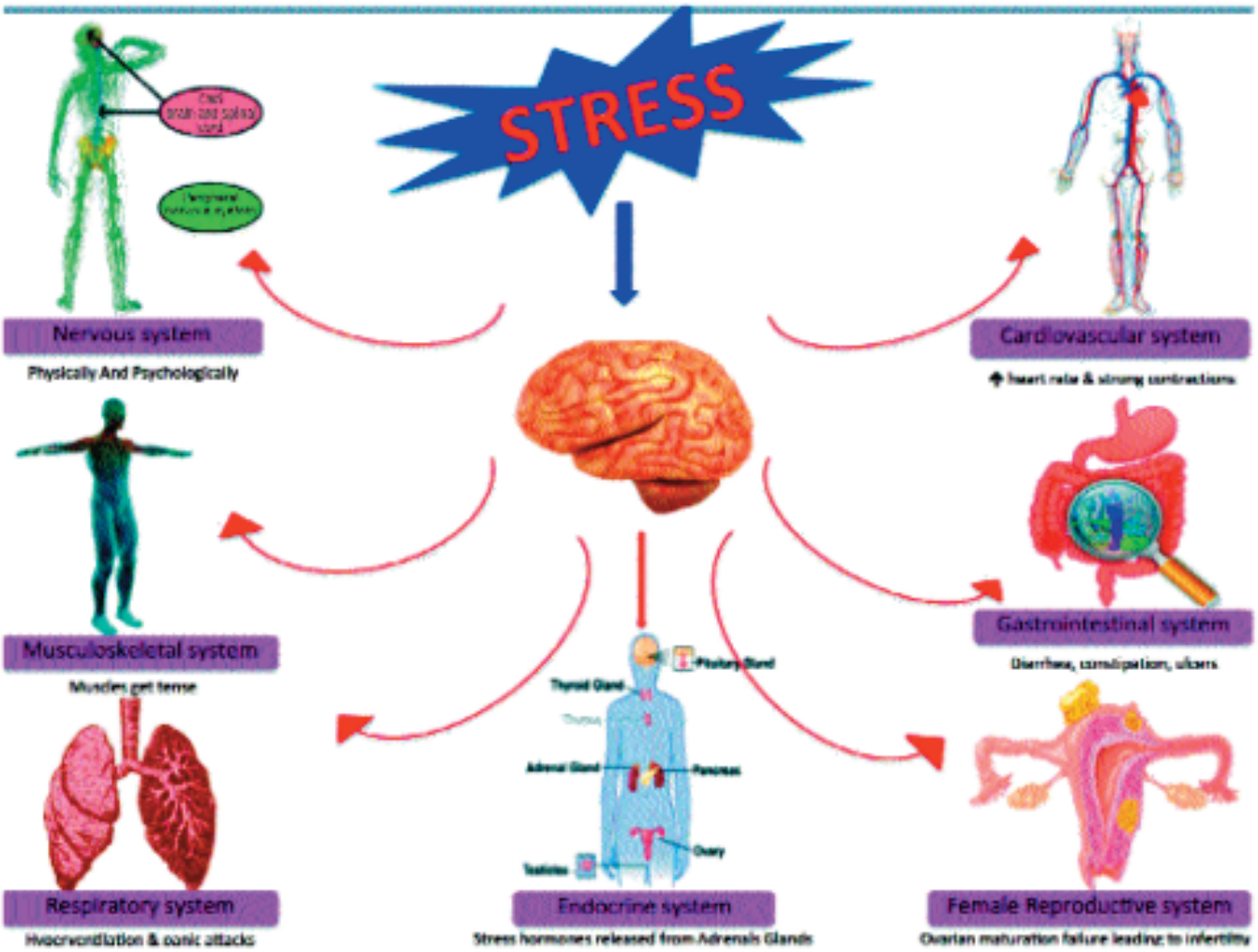

Figure: Response of different systems of the body towards stress.

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Fertility predominantly depends on the maintenance of the quantity and quality of the ovarian reserve which is determined by the extrinsic and intrinsic factors.[1] The reserve declines with increase in age of a female, owing to

the consumption of the follicle, and majorly due to the imbalance in the redox activity. Oxidative stress (OS) produced by mitochondrial dysfunction within the ovaries is considered as the main cause for chromosomal segregation disorders, maturation and fertilization failures, or oocyte/embryo fragmentation. Cellular redox activity is a normal mechanism of the male and female reproductive system but its inequilibrium affects the fertility by hindering attainment and maintenance of oocyte developmental potential during in vivo processes.[2] OS is a multifactorial process that implicates several different outcomes especially the oocyte maturation with its impact on fertility irrespective of female previous health, genetic predisposition as well as environmental condition.[3]

Sirtuins (silent information regulator, SIRT), a family of Nicotinamide Adenine Dinucleotide (NAD) dependent enzymes is evolving as main regulators of OS. SIRT1 signaling initiates a positive ovarian cells response by stimulating the expression of antioxidants and thus preventing dysfunction of the ovarian cells.[4] Moreover, significant change of SIRT1 mRNA has also been observed with increase in reactive oxidative species.[5] The detection of its role in OS with reference to oocyte maturity can pave new pathways for reduction of cost and trauma of procedures in assisted fertilization techniques such as in vitro fertilization and intracytoplasmic sperm injection by increasing oocyte maturity, fertilization and hence embryo implantation.

Although there are extensive facts available in literature indicating relationship between increased OS, infertility and decreased level of antioxidants, yet human studies to explain role of SIRT1 for expression of antioxidants, repair of cells, damaged by oxidative stress in order to prevent dysfunction of the ovarian cells have yet to be accomplished.

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