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### Sperm transcript dysregulation: Possible role in recurrent pregnancy loss



Vidhu Dhawan\*, Manoj Kumar, Vatsala Dadhwal, Dipika Deka, Rima Dada

Laboratory of Molecular Reproduction and Genetics, AIIMS, India

**Introduction:** With a host of accepted etiologies for recurrent pregnancy loss (RPL), the current focus has been shifted towards analysing the paternal factors as more than just mere vectors for transmission of genetic information. The non-genomic paternal delivery of spermatozoal mRNA transcripts is retained for translation of proteins for early embryonic development.

**Aim:** The current study was designed with an aim to analyse the dysregulation in sperm transcriptome and correlate with ROS and DFI values.

**Material/methods:** Semen samples from 75 male partners of couples with RPL and 30 healthy controls with proven fertility were obtained. Semen analysis was assessed by WHO (2010) criteria. Sperm RNA was isolated from the semen samples, reverse transcribed and q-PCR analysis was performed. Reactive oxygen species (ROS) levels were assessed by chemiluminescence and sperm chromatin structure assay (SCSA) was performed by flow cytometry.

**Results:** The mean DFI of male partners of couples with RPL (36.47) was significantly ( $p < .0001$ ) higher as compared to controls (25.32). The DFI in all the patients was seen to be  $>30$  against fertile controls ( $p < .0001$ ). The mean ROS level was seen to be higher ( $>25$ ) and calculated as 176.36 RLU/sec/million sperm. The seminal ROS values and DFI will be correlated with dysregulation in sperm transcripts.

**Conclusion:** The dysregulation in the levels of these hidden messengers can be established as an adjunct to routine semen analysis. Adoption of various lifestyle measures like yoga and meditation can be used for correcting sperm mRNA dysregulation by normalising ROS values.

#### Conflicts of interest

The authors have none to declare.

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### Effects of yoga based lifestyle intervention on genomic instability in major depressive disorder patients: A randomized controlled trial



Madhuri Tolahunase\*, Rajesh Sagar, Saima Khan, Rima Dada

All India Institute of Medical Sciences, New Delhi, India

**Background:** Modern lifestyle is responsible for high rates of major depressive disorder (MDD) and associated co-morbidities including suicidality and metabolic syndrome. Genomic instability and consequent cellular aging, associated with psychosocial stress and unhealthy lifestyle is linked to pathogenesis of MDD. This study evaluated effects of yoga based lifestyle modification program (YLMP) on 8OH2dG, reactive oxygen species (ROS), total antioxidant capacity (TAC), telomerase activity, depression symptoms, and lifestyle factors.

**Methods:** Fifty-six men and women with MDD were randomized to either YLMP group or routine medical therapy (RMT group)

for 12 weeks. Primary outcomes were levels of 8OH2dG, ROS, TAC and telomerase activity in peripheral blood, and scores of Beck Depression Inventory II (BDI-II). Secondary outcomes included lifestyle-related factors. Data were analyzed for within-group and between-group changes.

**Results:** YLMP group showed increase in the measures of telomerase activity ( $p = 0.02$ ) and TAC levels ( $p = 0.005$ ) and decreases in the measures of 8OH2dG and ROS (both  $p < 0.001$ ). Moreover, statistically significant between-group changes were observed between YLMP and RMT (all  $p < 0.01$ ). There was a significant reduction in BDI-II score in the YLMP group ( $-15.7$  score,  $p = 0.0013$ ) but not in RMT group ( $-5.2$  score,  $p = 0.44$ ); the between-group difference was significant ( $p = 0.04$ ).

**Conclusion:** In this RCT, yoga based lifestyle modification program group demonstrated balanced oxidative stress with the consequent decrease in both DNA damage and telomere attrition. These findings are suggestive of reductions in genomic instability and reversal of accelerated cellular aging in MDD patients.

#### Conflicts of interest

The authors have none to declare.

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### Influence of 5-HTTLPR genotype on adverse life events, oxidative stress, clinical severity and response to yoga based lifestyle intervention in major depressive disorder patients



Rima Dada\*, Madhuri Tolahunase, Rajesh Sagar

All India Institute of Medical Sciences, New Delhi, India

**Background:** Major depressive disorder (MDD) is associated with short (S) and a long (L) variants of serotonin transporter-linked polymorphic region (5-HTTLPR) in SLC6A4 gene and oxidative stress. The aim of this study was to understand moderation by an interaction between 5-HTTLPR, adverse life events (ALE) and oxidative stress on severity of depression and yoga based lifestyle intervention (YBLI) in MDD.

**Methods:** From 95 MDD cases, we collected ALE data, HAM-D 17 score, and blood samples to determine 5-HTTLPR genotype and oxidative stress, measured by reactive oxygen species (ROS) and total antioxidant capacity (TAC). 41 cases were also analyzed before and after YBLI.

**Results:** Compared to LL group, SS/SL group individuals showed increased HAM-D score as a function of ALE ( $r = .41$ ,  $p = .007$ ), which correlated positively with ROS levels ( $r = .31$ ,  $p = .040$ ) and negatively with TAC levels ( $r = -.351$ ,  $p = .042$ ), as well as reduced TAC ( $r = -.31$ ,  $p = .041$ ) and increased ROS ( $r = .30$ ,  $p = .016$ ) as a function of ALE. Both SS/SL and LL-groups responded to YBLI with significant decreases in HAM-D score and levels of ROS and significant increases in levels of TAC (all  $p < .001$ ) and showed change in Ham-D score as a function of ALE ( $r = -.45$ ,  $p = .008$ ), ROS ( $r = -.44$ ,  $p = .010$ ), and TAC ( $r = .39$ ,  $p = .018$ ).

**Conclusions:** ALE and oxidative stress alter MDD severity as a function of 5-HTTLPR genotype and their interactions may have a role in severity of MDD. YBLI is beneficial in MDD irrespective of 5-HTTLPR genotype, but the baseline adverse life events and oxidative stress influence the extent of clinical benefit.