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## Yoga based lifestyle intervention improve quality of life and cellular health of patients with complex chronic lifestyle diseases (CCLD)

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**Background:** Complex Chronic Lifestyle Diseases (CCLD) have become top conditions responsible for global burden of disease and decrease in both health and life span. Research on common biological mechanisms underlying these is lacking and yoga may be beneficial in addressing underlying pathology common to CCLD.

**Objectives:** To analyze the effect of yoga based lifestyle intervention (YBLI) on quality of life and cellular health in adult patients with CCLD.

**Methodology:** 120 CCLD patients (56 Male; age 26-60) with diagnosis of depression, infertility, rheumatoid arthritis, or glaucoma (30 subjects each), were randomized to either YBLI (yoga group) or routine medical care (control group). Yoga group received YBLI for 12 weeks (2 hours, 5 days a week). Data were collected 5 times: before (0 day) and after (12 Wk) intervention and after 6 months follow-up (96% response rate). Repeated measures ANOVA was used to estimate the interventions effect on quality of life (QOL) as measured by the WHOQOL-BREF scale and on blood biomarkers of cellular health as measured using standard protocols.

**Results:** Participants in the yoga group had a significant improvement in WHOQOL-BREF scores and biomarkers of cellular health (all  $P < 0.05$ ) compared to control group. Only depression and glaucoma patients in yoga group continued to show significant changes in all four domains of WHOQOL-BREF scale at 6 months follow-up. All CCLD disease groups showed significant increase in telomerase activity levels, decrease in cortisol and IL-6 levels and balance in levels of oxidative stress markers (blood reactive oxygen species and total antioxidant capacity) in yoga group. Yoga resulted in decreasing the rate of cellular aging, improved cognition, neuroplasticity and reduced expression of inflammatory genes and upregulated expression of genes of anti-inflammatory pathway and cell cycle repair genes.

**Conclusions:** Participation in the YBLI significantly improved QOL and cellular health among adult patients with CCLD. Alterations in cellular health may be an important common biological mechanism in CCLD.