

Program Adı

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Tezin Adı

Telomere dynamics in patients suffering from recurrent miscarriage

Tezi Hazırlayan

Rameez Hassan PIRZADA

Danışman

PROF. DR. NEDİME SERAKINCI

ABSTRACT

Telomeres are the tandem repeats (TTAGGG) present at the ends of the chromosomes that ensure the chromosome stability and also prevent chromosome ends from degradation. Telomeres in human cells shorten with each cellular division and are linked to cellular senescence.

Surprisingly, there are few studies showing an association of telomere length and associated shelterin protein complex with various reproductive disorders such as miscarriage. The study included patients (n=20) and control group (n=10). The telomere length was measured using Universal short telomere elongation length assay (U-STELA) and Telomere restriction fragment length (TRF) analysis. The gene expressions of important shelterin protein complex (TRF1, TRF2, POT1, and TPP1) were measured using Real time quantitative reverse transcriptase PCR (qRT-PCR).

The study shows down regulation of *TRF2* and *TPP1* and an overall decline in average telomere length clearly indicates the significant ($p \leq 0.05$) correlation between abnormal telomere dynamics and recurrent pregnancy loss.

In conclusion, shorter telomere length and inappropriate binding of the TRF2 and TPP1 at chromosomal ends appears to play a critical role in recurrent pregnancy loss. The down-regulation of 2 major shelterin proteins (TRF2, TPP1), contributes to incomplete capping known to have led to chromosomal instability through Breakage-fusion-bridge (BFB) cycle. An improper binding of shelterin complex leaves ends of the chromosomes uncapped which could trigger unwanted DNA damage response pathways (ATM and ATR) and may induce cellular senescence by considering telomeres ends as a double strand break.

The definite cause between abnormal telomere length dynamics in inducing idiopathic recurrent pregnancy loss needs further research and evaluation by enrolling a larger number of studies to further endorse the findings of this study.

Keywords: Idiopathic Recurrent Pregnancy loss, Universal STELA, TRF, Shelterin proteins