

## CHROMOSOMAL INSTABILITY IN PERIPHERAL BLOOD LYMPHOCYTES OF PATIENTS WITH REPRODUCTIVE FAILURE ASSESSED BY MICRONUCLEUS ASSAY

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Received in February 2012  
CrossChecked in August 2012  
Accepted in August 2012

We investigated chromosomal instability in peripheral blood lymphocytes (PBL) of patients with reproductive failure in respect to age, smoking habits, gender, miscarriages, and semen parameters. The study involved 36 individual cases of reproductive failure (18 men and 18 women) attended at the Clinical Centre of Kragujevac, Serbia, and 30 healthy subjects (15 men and 15 women). Micronuclei (MN) frequency was estimated in PBL using the cytokinesis-block micronucleus (CBMN) assay. The baseline MN frequencies were significantly higher ( $p=0.031$ ;  $p<0.001$ ) in male  $[(9.22 \pm 4.70) \text{ MN per } 1000 \text{ BN cells}]$  and female patients  $[(13.50 \pm 2.5) \text{ MN per } 1000 \text{ BN cells}]$  than in male and female healthy controls  $[(6.27 \pm 2.66) \text{ MN per } 1000 \text{ BN cells}; (6.80 \pm 2.98) \text{ MN per } 1000 \text{ BN cells}]$ . The mean baseline MN frequency did not significantly differ between miscarriage groups and between patients with and without normal values of semen parameters. The correlations between poor sperm concentration ( $<20 \times 10^6 \text{ mL}^{-1}$ ), rapid progressive motility ( $<25\%$ ), normal morphology ( $<30\%$ ), and MN frequencies were negative, but not statistically significant. We found that only gender significantly influenced the MN rates in analysed patients. There were no significant differences between age groups and between smokers and non-smokers in patients and control samples. We conclude that the increase in baseline MN frequency in PBL of patients with reproductive failure corresponds to the increase in chromosomal damage, which occurs as a result of complex events that cause reproductive disorders.

**KEY WORDS:** *age, gender, infertility, micronuclei, semen quality, smoking*

Infertility is defined as the inability to conceive after twelve months of regular unprotected sexual intercourse. It may be related to a variety of genetic (1, 2), as well as nongenetic factors (3-5).

Previous studies confirmed higher frequency of chromosomal abnormalities in the sperm of men with abnormal semen parameters (6, 7). Chromosomal abnormalities were also found in peripheral blood lymphocytes of infertile men (8,

9). Two comet assay studies (10, 11) reported a significantly higher level of DNA strand breaks in the sperm of infertile men compared to the controls. Duzcan et al. (12) suggested a greater incidence of sex aneuploidy in somatic cells of oligozoospermic men.

Female infertility is also associated with genomic instability. High incidence of genomic instability in lymphocytes of women with polycystic

















