Matrix metalloproteinase-3 gene polymorphism and its mRNA expression in rheumatoid arthritis

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ABSTRACT. Matrix metalloproteinase-3 (MMP-3) can mediate the occurrence and development of rheumatoid arthritis (RA). The MMP3 promoter gene exhibits polymorphism with 5A/6A alleles. We investigated the correlation between the expression of MMP3 gene polymorphism and RA to provide an objective basis for prognosis evaluation. We enrolled 80 RA patients and 80 healthy subjects. Enzyme-linked immunosorbent assay was used to detect MMP-3 serum levels, pyrosequencing was used to test MMP3 genotypes, and real-time polymerase chain reaction determined MMP-3 mRNA expression levels. Compared with the control group, the serum level of MMP-3 in RA patients increased significantly (P < 0.05). The serum level of MMP-3 in RA patients in the active period was markedly elevated compared with that in patients in the relief period (P < 0.05). There was no statistically significant difference between MMP3 gene frequency distribution in the RA patients and the control group (P > 0.05). MMP-
3 mRNA expression in the RA patients was markedly upregulated compared with the control group (P < 0.05), while RA patients in the active period exhibited higher MMP-3 mRNA expression (P < 0.05). There was no significant difference in MMP-3 mRNA expression between RA patients with or without the 6A/6A genotype (P > 0.05). RA patients exhibited higher serum MMP-3 levels and mRNA expression, which were more obvious in the active period. MMP-3 is associated with the occurrence and development of RA bone erosion, and its serum level and mRNA expression can be treated as important predictors of joint damage.

**Key words:** Rheumatoid arthritis; Matrix metalloproteinase-3; Genetic polymorphism; mRNA expression