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Berberine influences bone homeostasis through inhibited osteoclastogenesis in zymosan-induced model of rheumatoid arthritis

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Rheumatoid arthritis (RA) is systematic autoimmune inflammatory disease characterized by chronic joint inflammation and generalized bone destruction. Although some classical and novel therapies influence positively the course of the disease, there is a great need for more effective approaches. Berberine is an isoquinoline alkaloid with a broad spectrum of biological activities, including inhibition of RANKL-mediated osteoclast differentiation. In the present study we have investigated its influence on the joint destructive processes in a mouse model of erosive arthritis, induced by intraarticular injection of zymosan. Berberine was administered intraperitoneally under two different schemes at a dose of 10 mg/kg. Histopathological results showed that the substance ameliorated cartilage and joint erosion expressed through less PG and GAG loss and less pannus formation. Berberine inhibited MCSF+RANKL-induced and IL-1-induced osteoclast differentiation of bone marrow cells. Additionally, it changed the expression of CD68, RANKL, TRAIL and DR5 by bone marrow cells stimulated with M-CSF+RANKL. Immunohistochemical analysis showed that the substance influenced TGF- β expression in the joints. Our data proved the potential suppressive effect of berberine on the chronification of joint inflammation in correlation with the late events connected with bone remodeling. Successful inhibition of erosive processes in this experimental model described, so far encourages further investigations leading to elucidation of detailed mechanisms of berberin's action.

Biography

Petya Ganova has completed her Bachelor's and Master's degree in Biotechnology at University of Chemical Technology and Metallurgy. She is currently a PhD student at The Stephan Angeloff Institute of Microbiology, Department of Immunology, Bulgaria. She is a Member of the Bulgarian Society of Immunology, part of the European Federation of Immunological Societies (EFIS). She has two publications in the field of her research topic.

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