Venlafiaxine alleviates complete Freundôs adjuvant-induced arthritis in rats:Modulation of STAT-3/IL-17/RANKL axis

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Abstract

Aims
Rheumatoid arthritis is usually accompanied by various comorbidities especially on the psychological side such as depression. This study aimed at revealing the potential curative effects of venlafaxine (VFX), a serotonin/norepinephrine reuptake inhibitor (SNRI), on experimentally-induced arthritis in rats.

Methods
Arthritis was induced by injecting complete Freund's adjuvant (CFA, 0.1 ml, s.c.). One day thereafter, VFX (50 mg/kg, p.o.) was given for 21 days. Methotrexate was used as a standard disease modifying anti-rheumatic drug.

Key findings
CFA injection caused prominent arthritis evident by the increase in the hind paw and ankle diameter accompanied by elevating tumor necrosis factor-alpha, interleukin-6, interleukin-17 and matrix metalloproteinase-3 levels, effects that were diminished by VFX. Moreover, VFX down regulated gene expressions of receptor activator of nuclear factor kappa-B (NF-ϰB) ligand and signal transducer and activator of transcription-3 beside hampering immunohistochemical expression of vascular endothelial growth factor and NF-ϰB. This SNRI also improved the oxidant status of the hind limb as compared to the arthritic group. Nonetheless, MTX was better in amendment of arthritis authenticated by its effect on some inflammatory and oxidative stress biomarkers.

Significance
This study provides a novel therapeutic use of VFX as a considerable anti-arthritic drug and offers an incentive to expand its use in RA.

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