

The nitrosylation of thiols is elevated in rheumatoid arthritis

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Nitrosothiols (RSNO's) are generated by the NO-dependent S-nitrosylation of thiol containing proteins and peptides such as albumin and glutathione. These RSNO's decompose and release NO under most physiological conditions and are thought to elicit many NO functions. In this study, RSNO's were measured in rheumatoid arthritis (RA) patients.

Twelve plasma samples from healthy control subjects and twelve paired plasma and synovial fluid samples from RA patients were collected. The RSNO concentrations were determined using an EPR spectrometry in combination with the spin trap, N-methyl-D-glucamine dithiocarbamate (MGD) complexed with iron (II). The metabolites of NO, nitrite and nitrate were also measured using a capillary electrophoresis method. Additionally, clinical markers of RA disease activity in the synovial fluid and plasma of RA patients were quantified.

The median RSNO concentration was 0 nM (interquartile range (IQR) 68), 109 nM (IQR 282) and 309 nM (IQR 470) in normal plasma, RA plasma and RA synovial fluid, respectively. Significant differences in RSNO concentrations were found between the RA synovial fluid and RA plasma (less than $p=0.05$) and the RA plasma and normal plasma (less than $p=0.05$). Nitrite levels were also significantly elevated in the RA plasma when compared to normal plasma (less than $p=0.05$). Surprisingly, the RSNO concentrations did not correlate with the nitrite, nitrate or NOX concentrations, although the sample number is small. However, the synovial fluid RSNO levels correlated with the synovial fluid neutrophil count ($r_s = 0.552$, less than $p=0.05$) and blood haemoglobin levels ($r_s = -0.515$, less than $p=0.05$).

These data show that the RSNO concentration is elevated in RA patients and suggest the possibility that RSNO's may be useful as a marker of disease activity in RA.