## Beneficial Effect of N-acetylcysteine on Antineutrophil Cytoplasmic Antibody-associated Vasculitis

*To the Editor:*

We read with interest the recent contribution by Drs. Fernández-Fernández and Sesma[1]. They introduced 2 significant studies: the IFIGENIA trial (Idiopathic Pulmonary Fibrosis International Group Exploring N-Acetylcysteine I Annual study)[2] and the study by Guilpain, *et al*[3] showing that antimyeloperoxidase (MPO) antibodies generated a reactive oxygen species that was highly harmful to endothelial cells, and that N-acetylcysteine (NAC) significantly reduced the activation of MPO and improved the survival of endothelial cells through the augmentation of glutathione biosynthesis. However, we would like to add another mechanism of NAC that will be useful as adjuvant therapy for vasculitis associated with antineutrophil cytoplasmic autoantibodies (ANCA).

According to a study by Spapen, *et al*[4], NAC had no significant effects on plasma tumor necrosis factor, interleukin 6 (IL-6), or IL-10 levels, but greatly decreased IL-8 during early human septic shock. Hsieh, *et al*[5] reported that the polymorphonuclear neutrophil (PMN)-stimulating activity of ANCA was demonstrated by enhancing IL-8 production that was more prominent by MPO-ANCA. The production of IL-8 by PMN was significantly increased by anti-MPO ($p < 0.01$) and antiproteinase-3 ($p < 0.05$) after 24 h of incubation[5]. IL-8, the specific chemoattractant of PMN, enhances release of lysosomal enzymes and generation of reactive oxygen metabolites from PMN[6]. However, the PMN stimulation by ANCA was not through protein kinase, $H_2O_2$, or superoxide anion radicals because their inhibitors exerted no effect on ANCA-mediated activation[5].

Therefore, it is possible that NAC may be useful and helpful as adjuvant therapy for patients with ANCA-associated vasculitis through inhibition of IL-8 rather than reactive oxygen species. It would also be interesting to measure the level of IL-8 before and after the treatment of NAC in patients with ANCA-associated vasculitis. However, further studies are necessary to elucidate the real pathways of ANCA-mediated PMN activation by IL-8 and the clinical effect of NAC in the disease process.

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