

Artemisinin: Anti-inflammatory and Immunoregulatory Functions

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Shi C, Li H, Yang Y and Hou L. Anti-Inflammatory and Immunoregulatory Functions of Artemisinin and Its Derivatives. Mediators of Inflammation Volume 2015, Article ID 435713, 7 pages
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Abstract:

Artemisinin and its derivatives are widely used in the world as the first-line antimalarial drug. Recently, growing evidences reveal that artemisinin and its derivatives also possess potent anti-inflammatory and immunoregulatory properties. Meanwhile, researchers around the world are still exploring the unknown bioactivities of artemisinin derivatives. In this review, we provide a comprehensive discussion on recent advances of artemisinin derivatives affecting inflammation and autoimmunity, the underlying molecular mechanisms, and also drug development of artemisinins beyond antimalarial functions.

Discussion:

This recent publication gives food for thought regarding a commonly used natural anti-infective agent in a different medical setting. Most of the first thoughts regarding Artemesia products are generally in the direction of infectious disease therapy or potentially uses in oncology. This is reasonable as many data exist underscoring its use in these settings. The use of this family of agents in autoimmunity and inflammation is less considered and known in general practice. My hope in spotlighting this thinking regarding artemesia compounds (via this excellent paper by Shi et.al.) is to broaden the use of the artemesia family in clinical practice.

I have personally been involved in the research and use of artemisinins in the care of cancer and chronic infection patients and have spoken in conferences extensively about those applications.

This paper (after briefly discussing the best known mechanism of action in the treatment of Malaria) highlights the following areas of beneficial mechanisms artemisinin and derivatives:

1. Anti-inflammatory and immunomodulatory mechanisms
2. Rheumatoid Arthritis
3. Lupus
4. Multiple Sclerosis

5. Allergy

The authors' of this paper reference 41 peer reviewed publications on the subject as well as providing some of the clearest diagrams of cytokine and other mechanisms of action I have personally seen. Some publications included in this paper, and some from my own files, which illustrate these inflammation modulating include:

Anti-Inflammatory Properties and Regulatory Mechanism of a Novel Derivative of Artemisinin in Experimental Autoimmune Encephalomyelitis. [1]

Artesunate Abolishes Germinal Center B Cells and Inhibits Autoimmune Arthritis. [2]

A Pilot Study of the Therapeutic Efficacy and Mechanism of Artesunate in the MRL/lpr Murine Model of Systemic Lupus Erythematosus. [3]

Artesunate induces oncosis-like cell death in vitro and has antitumor activity against pancreatic cancer xenografts in vivo. [4]

Antitumor Activity of Artemisinin and Its Derivatives: From a Well-Known Antimalarial Agent to a Potential Anticancer Drug. [5]

Implications for practice:

- Direct use in autoimmune conditions
- Direct use in inflammatory conditions
- Synergy in multifactorial chronic illnesses

In summary it has been my direct experience, and is born out in the data, that the use of artemisinin and derivatives in autoimmune and complicated multifactorial illnesses is an excellent addition to the therapeutic arsenal. Consider this powerful family of agents any time you are clinically considering other polyfunctional agents such as boswellia and curcumin.

References:

1. Wang Z, Qiu J et.al. Anti-Inflammatory Properties and Regulatory Mechanism of a Novel Derivative of Artemisinin in Experimental Autoimmune Encephalomyelitis. The Journal of Immunology, 2007, 179: 5958–5965.
2. Hou L, Block KE, Huang H. Artesunate Abolishes Germinal Center B Cells and Inhibits Autoimmune Arthritis. PLoS ONE 9(8): e104762. doi:10.1371/journal.pone.0104762

3. Ouyang Jin, Huayong Zhang, Zhifeng Gu, Shengnan Zhao, Ting Xu, Kangxing Zhou, Bo Jiang, Jie Wang, Xiaofeng Zeng and Lingyun Sun. A Pilot Study of the Therapeutic Efficacy and Mechanism of Artesunate in the MRL/lpr Murine Model of Systemic Lupus Erythematosus. *Cellular & Molecular Immunology*. 2009;6(6):461-467.
4. Du JH, et. al. Artesunate induces oncosis-like cell death in vitro and has antitumor activity against pancreatic cancer xenografts in vivo. *Cancer Chemother Pharmacol* (2010) 65:895–902. DOI 10.1007/s00280-009-1095-5
5. Maria P. Crespo-Ortiz and Ming Q. Wei. Antitumor Activity of Artemisinin and Its Derivatives: From a Well-Known Antimalarial Agent to a Potential Anticancer Drug. *Journal of Biomedicine and Biotechnology*. Volume 2012, Article ID 247597, 18 pages. doi:10.1155/2012/247597