

Compound Glycyrrhizin Promotes the Transformation of Neutrophils from Pro-Inflammatory to Anti-Inflammatory Effects in Psoriasis Vulgaris

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In psoriasis vulgaris, under what conditions do neutrophils demonstrate pro-inflammatory versus anti-inflammatory effects? We retrospectively analyzed medical records of patients treated with Compound Glycyrrhizin for psoriasis, encompassing 62 cases of psoriasis vulgaris with disease durations ranging from 0 to 31 years, alongside 23 healthy control subjects. Notably, our findings indicate that Compound Glycyrrhizin facilitates the modulation of neutrophils, promoting their transition from a pro-inflammatory to an anti-inflammatory phenotype.

In this study, we reviewed the clinical phenotypes and neutrophil levels in psoriasis vulgaris patients before and after treatment with Compound Glycyrrhizin. Patients received Compound Glycyrrhizin Injection (60 mL/day, intravenously, Minophagen Pharmaceutical Co., Ltd, Japan) for 7–10 days.

Our data revealed significantly elevated neutrophil counts in the psoriasis vulgaris group compared to the healthy group (Figure 1A). Intriguingly, treatment with Compound Glycyrrhizin resulted in a notable increase in neutrophil counts, which correlated with significant reductions in Psoriasis Area and Severity Index (PASI) scores, as well as marked improvements in erythema, scaling and thickening of the lesion (Figure 1B–D).

We observed a sustained elevation in neutrophil levels over disease courses of up to 31 years (Figure 1E). Addition, a positive correlation was identified between neutrophil levels and disease duration within the first 4.25 years (Figure 1F). These findings suggest that neutrophils exhibit dual roles in psoriasis vulgaris, contributing to both pathological inflammation and protective immune responses; And Compound Glycyrrhizin appears to facilitate their functional transition from a pro-inflammatory to an anti-inflammatory state.

Traditionally, neutrophils have been regarded as exclusively pro-inflammatory cells. However, emerging evidence suggests that certain neutrophil subtypes may possess anti-inflammatory properties. For instance, peripheral blood neutrophils demonstrate anti-inflammatory roles during the day and tissue-reparative functions at night.¹ In this study, we found that the increasing number of pro-inflammatory neutrophils induces erythema, scaling and thickening of the lesion in psoriasis vulgaris patients, particularly in the early disease stages. Furthermore, we discovered Compound Glycyrrhizin can shift neutrophils from a pro-inflammatory to an anti-inflammatory state, thereby ameliorating clinical symptoms. In our future work, we will leverage single-cell transcriptome sequencing to identify neutrophil subtypes, elucidate their diverse functions, and explore the mechanisms driving their phenotypic transitions. These investigations aim to deepen our understanding of psoriasis vulgaris pathogenesis and inform the development of novel therapeutic strategies.

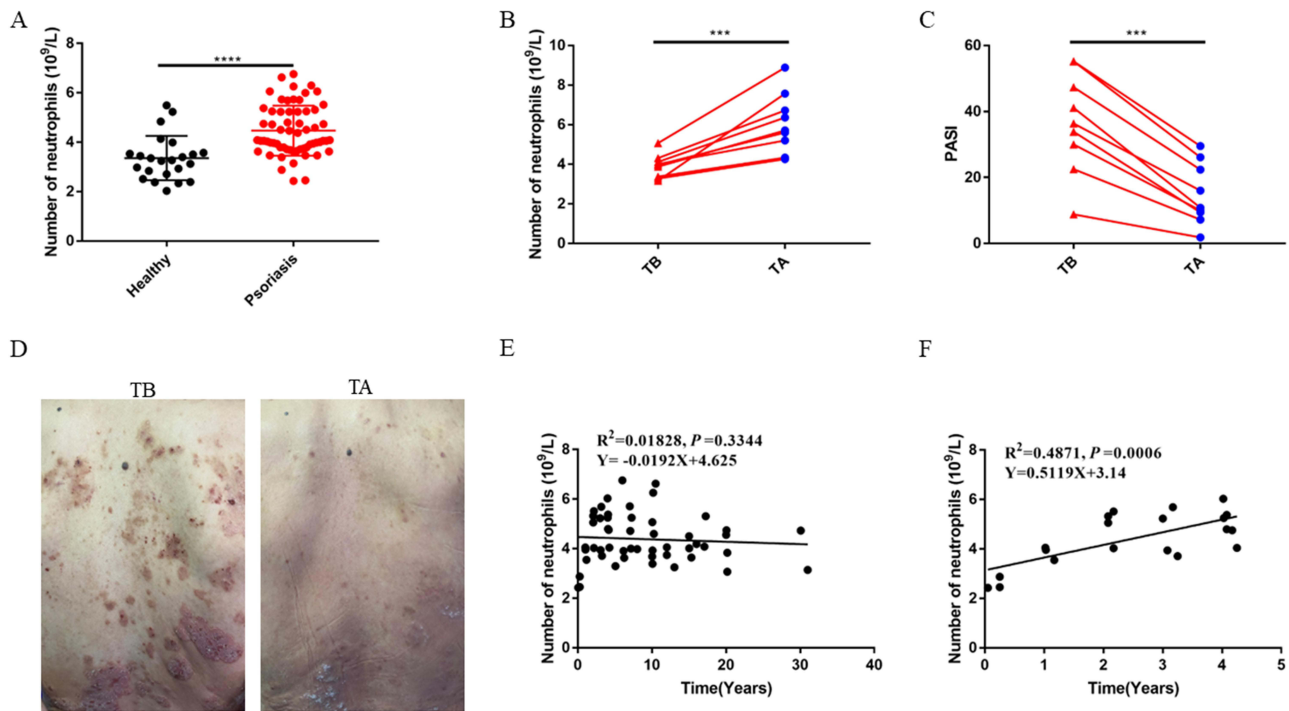


Figure 1 Peripheral blood neutrophil levels and clinical phenotypes in psoriasis vulgaris patients. Neutrophil levels are significantly elevated in the psoriasis vulgaris group compared to the healthy group (A). Intriguingly, treatment with Compound Glycyrrhizin resulted in a notable increase in neutrophil count (B), concomitant with a significant decrease in PASI scores (C), and a marked improvements in erythema, scaling and thickening of the lesion (D). Neutrophil levels show a positive correlation with disease duration within the first 4.25 years (E and F). Data was shown as mean \pm SEM. *** represents $P < 0.001$; **** represents $P < 0.0001$.

Abbreviations: PASI, Psoriasis Area and Severity Index; TB, Treatment before; TA, Treatment after.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of Chongqing Hospital of Traditional Chinese Medicine (No. 2022-ky-69). All patients gave their written informed consent. This study was conducted in accordance with the Declaration of Helsinki.

Funding

This work was funded by National Natural Science Foundation of China (82104872), Special Support for Chongqing Postdoctoral Research Program (2022CQBSHTB3062).

Disclosure

All the authors declare no conflict of interest.

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