Meta-analysis is a method that integrates the conclusions from various literature sources to provide a comprehensive evaluation, which is frequently used in professional fields such as medicine, psychology, education, ecology, and others. In layman's terms, Meta-analysis involves pooling multiple similar research articles, summarizing their findings, and conducting a series of scientific analyses to arrive at a scientific conclusion. Compared to individual studies, meta-analysis can reduce random errors, enhance statistical power, and address inconsistencies in research findings.

Our meta-analysis followed the fixed basic routine, which includes selecting the topic, formulating search strategies, determining inclusion and exclusion criteria, screening literature, evaluating literature quality, extracting data, conducting data analysis, and writing up the results.

There have been two meta-analyses on the effects of VitD intervention on AITD development, respectively incorporating 6 and 7 studies. The first [1] found that at least 6 months of VitD intervention significantly reduced serum TPOAb levels, with lower TPOAb and TgAb levels after treatment compared to placebo. No other subgroup analyses were conducted beyond intervention duration. The second meta-analysis [2] showed VitD supplementation significantly lowered serum TPOAb levels compared to controls, but did not affect TgAb or thyroid function. Subgroup analyses by intervention duration, pre-treatment VitD status, and gender revealed that at least 3 months of VitD intervention reduced TPOAb levels more than controls in both VitD-insufficient and -sufficient individuals of both genders.

Our meta-analysis has further updated the previous findings and conducted multiple subgroup analyses, analyzing based on different types of included literature, as well as conducting subgroup analyses according to the duration and frequency of vitamin D supplementation, and the patients' baseline vitamin D levels. Reliable and optimistic results were obtained.

**References**

[1] S. Wang, Y. Wu, Z. Zuo, et al., The effect of vitamin D supplementation on thyroid autoantibody levels in the treatment of autoimmune thyroiditis: a systematic review and a meta-analysis, Endocrine. 59 (2018) 499-505.

[2] H. Jiang, X. Chen, X. Qian, et al., Effects of vitamin D treatment on thyroid function and autoimmunity markers in patients with Hashimoto's thyroiditis-A meta-analysis of randomized controlled trials, J Clin Pharm Ther. 47 (2022) 767-775.