# What is the impact of n-3 PUFAs on inflammation markers in Type 2 diabetic mellitus populations?: a systematic review and meta-analysis of randomized controlled trials


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## Introduction

Diabetes is a major global health concern with an increasing prevalence. It is estimated that by 2030, approximately 366 million adults will be diagnosed with diabetes worldwide.

Although T2DM is strongly linked to chronic low-grade inflammation, It is not usually treated with anti-inflammatory pharmaceuticals. However, it is thought that many dietary factors can influence various aspects of inflammation either promoting or retarding specific inflammatory components.

Whether n-3 PUFAs favorably affect biomarkers of inflammation in people with T2DM is not clear.

## Aim

To explore the possible role of n-3 polyunsaturated fatty acids (PUFAs) in lowering inflammation markers in individuals with type 2 diabetes mellitus.

## Methods

PubMed, CNKI and Cochrane databases were searched until December 30, 2015; references from papers or reviews were also retrieved and screened. Screening was performed by two independent researchers, and randomized controlled trials reporting the specific n-3 PUFA type, dose, frequency, and duration of treatment, as well as the baseline and follow-up concentrations of inflammation markers, including interleukin 2 (IL-2), interleukin 6 (IL-6), tumor necrosis factor alpha (TNF-α) and C-reactive protein (CRP), were selected for final analysis. Data analysis was performed using RevMan 5.2 software.

## Results

Eight studies involving 955 participants were included; all reported CRP. N-3 PUFAs significantly reduced CRP concentration compared with control [SMD 95% CI, 1.90 (0.64, 3.16), Z=2.96, P=0.003, random effect model].

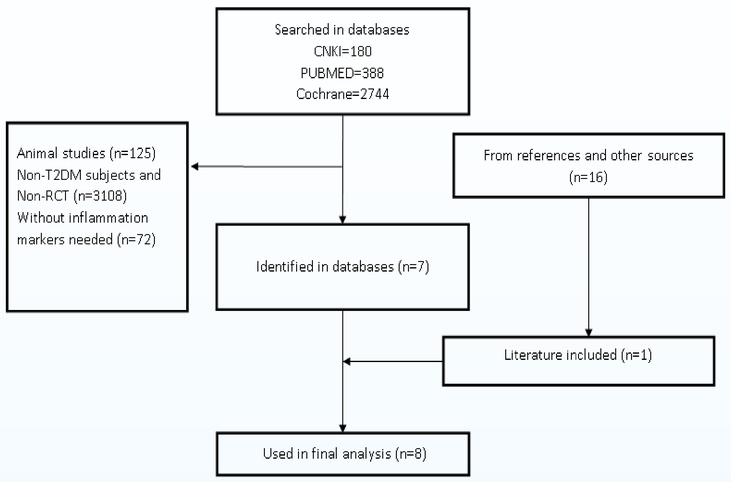


*Figure 1 The flow chart of literature selection*

For a subgroup analysis, EPA and DHA were tested separately (Figure 3 Subgroup analysis of n-3 PUFA on CRP). Although the heterogeneity was significant in both subgroups, the P values for the SMD in each analysis were less than 0.05 indicating that both EPA and DHA lower CRP concentration.

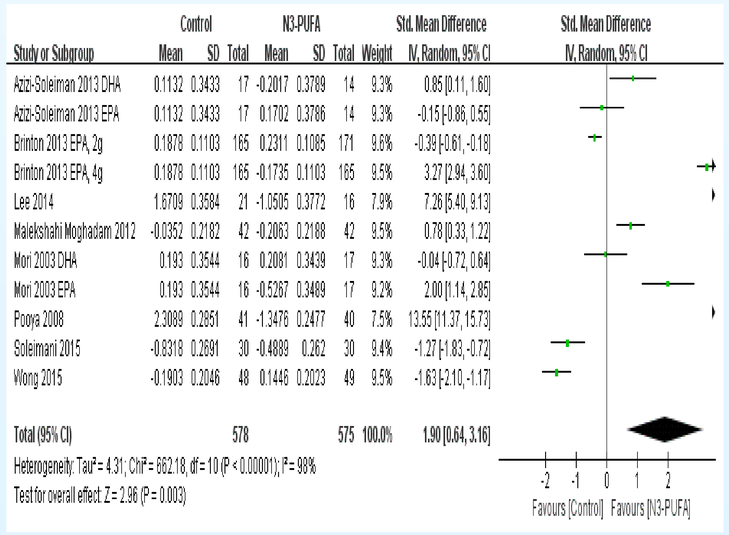


*Figure 2 Forest plot for effect of n-3 PUFA on CRP concentration in all studies (random effect model).*

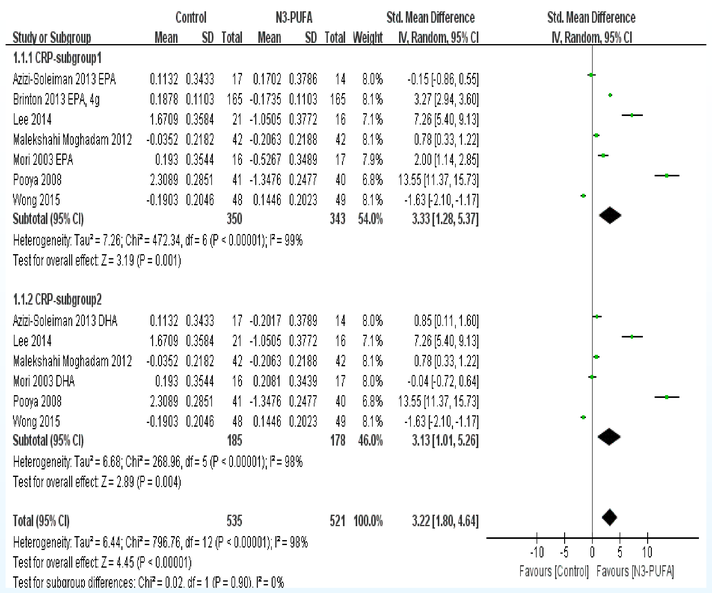


*Figure 3 Subgroup analysis of n-3 PUFA on CRP*

Only two trials reported data for TNF-α concentration. Malekshahi Moghadam found that n-3 PUFA intake at 2.7 g/d significantly lowered TNF-α concentration compared to sunflower oil as placebo. However, Mori reported that neither EPA nor DHA at 4 g/d lowered TNF-α concentration in early-stage T2DM patients.

## Conclusion

N-3 PUFAs decrease CRP concentration in type-2 diabetes mellitus. However, larger and rigorously designed RCTs are required to confirm this finding and extend it into other inflammatory biomarkers.


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## Acknowledgements

We appreciate DSM for the grant support.