

Efficacy and safety of herbal therapies in the treatment of hyperlipidemia: A systematic review of randomized controlled trials

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Hyperlipidaemia is a significant global health burden contributing to approximately 4.4 million deaths annually. Although conventional lipid-lowering therapies are effective, concerns regarding fear of adverse effects and medication adherence have increased interest in herbal interventions. This systematic review aimed to critically evaluate the efficacy and safety of herbal interventions for hyperlipidaemia management based on randomized control trial (RCT) evidence. A comprehensive literature search was conducted across PubMed, Web of Science, Scopus, and ScienceDirect, following PRISMA guidelines. Included studies were RCTs conducted on human participants, assessing combined or single herbal interventions compared with placebo, lifestyle modifications or standard lipid-lowering therapies. Data extraction was performed using standardized forms, collecting information on plant species, study characteristics, participants' demographics, intervention details and lipid profile outcomes, including total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C), and triglycerides (TG). A total of 100 eligible articles were included in the final review. Plant-wise analysis revealed promising results for several herbal interventions. *Zingiber officinale* (n=2) showed TC reduction ranging from 4.69-11.62 mg/dL, HDL-C increase of 1.74-2.26 mg/dL and TG reduction of 2.17-4.64 mg/dL. *Aloe vera* (n=3) demonstrated variable TC changes from 2.4-24.4 mg/dL and TG reduction from 69.10-97.2 mg/dL. *Allium sativum* (n=4) studies indicated variable changes in lipid parameters with TC reduction ranging from 3.00 – 27.46 mg/dL. *Trigonella foenum-graecum* (n=2) showed minimal TC reduction, ranging from 0.80-2.01 mg/dL. The extracted data encompassed various populations, intervention durations ranging from weeks to months and different dosage forms. Safety profiles were reported with minimal adverse effects. This systematic review provides evidence highlighting the potential of several herbal therapies for hyperlipidaemia management. However, standardization of herbal products, optimal dosing protocols and long-term safety assessments remain important considerations for clinical applications.

Keywords: *Hyperlipidaemia, Dyslipidaemia, Systematic review, Herbal interventions, Randomized control trials*