

# Benefits of vitamin E-coated versus conventional membranes in chronic haemodialysis patients: a systematic review and meta-analysis

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## Introduction

Accruing evidence suggests that Vitamin E-coated membranes (VEMs) can improve inflammation, oxidative stress and anemia control in chronic hemodialysis patients.

## Objectives

We aimed at conducting a systematic review and meta-analysis to assess potential benefits of these membranes on several patient- and dialysis-related outcomes.

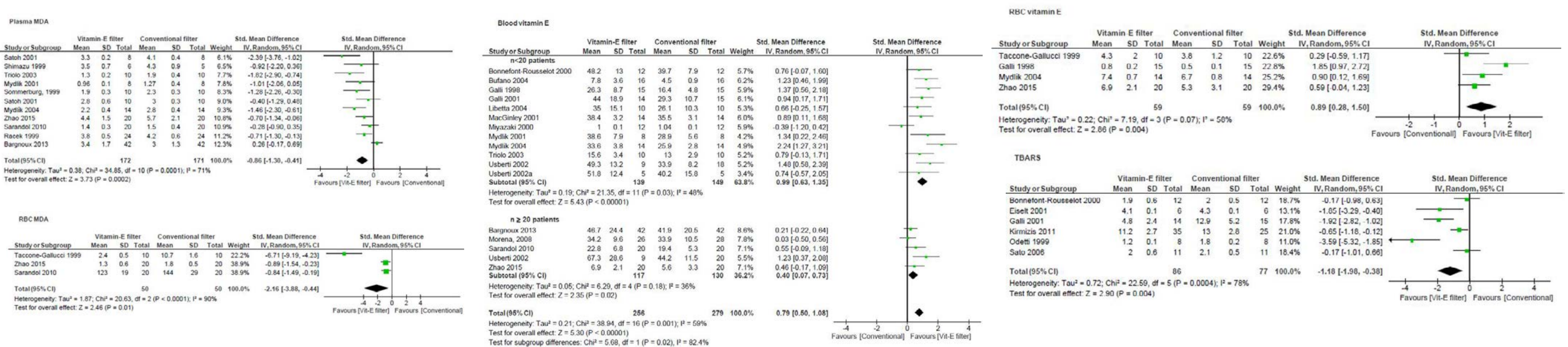
## Methods

Cochrane CENTRAL, Ovid-MEDLINE and PubMed databases were searched for English-language articles without time or follow-up restriction. We included any controlled (randomized and non-randomized) trial comparing VEMs versus conventional-membranes. Endpoints of interest were a series of biomarkers pertaining to anemia status, inflammation, oxidative stress and dialysis efficacy/status.

## Results

From a pool of 426 articles retrieved, we found 60 studies matching our search criteria. VEMs produced a significant decrease in Thiobarbituric Acid Reactive Substances (SMD -1.18; 95% CI: -1.98, -0.38), plasma and RBC Malonylaldehyde (SMD -0.86; 95% CI: -1.31, -0.41 and -2.16; 95% CI: -3.88, -0.44, respectively) and a significant increase in blood and RBC Vitamin E (SMD 0.79; 95% CI: 0.50, 1.08 and 0.89; 95% CI: 0.28, 1.50 respectively) (Fig. 1, upper panel). VEMs significantly improved Erythropoietin Resistance Index (SMD -0.37; 95% CI -0.70, -0.03) but reduced Transferrin Saturation (MD -3.59 %; 95% CI:-5.44, -1.73) (Fig. 1, bottom panel on the left side) and had no impact on other indexes on anemia control, such as hemoglobin and hematocrit level, red blood cells (RBC) count, dose of ESAs and other parameters of iron status. Of note, VEMs use was associated with a significant decrease in IL-6 levels as compared with standard membranes (MD -2.25 pg/mL; 95% CI: -3.21, -1.30) (Fig.1, bottom panel on the right side). No differences with respect to control were noticed on other endpoints of interest, such as lipid profile, dialysis adequacy (Kt/V), blood pressure, albumin and uric acid.

### Effects of ViE-m vs. conventional membrane on Oxidative stress parameters



### Effects of ViE-m vs. conventional membrane on Anemia parameters

### Effects of ViE-m vs. conventional membrane on Inflammation parameters

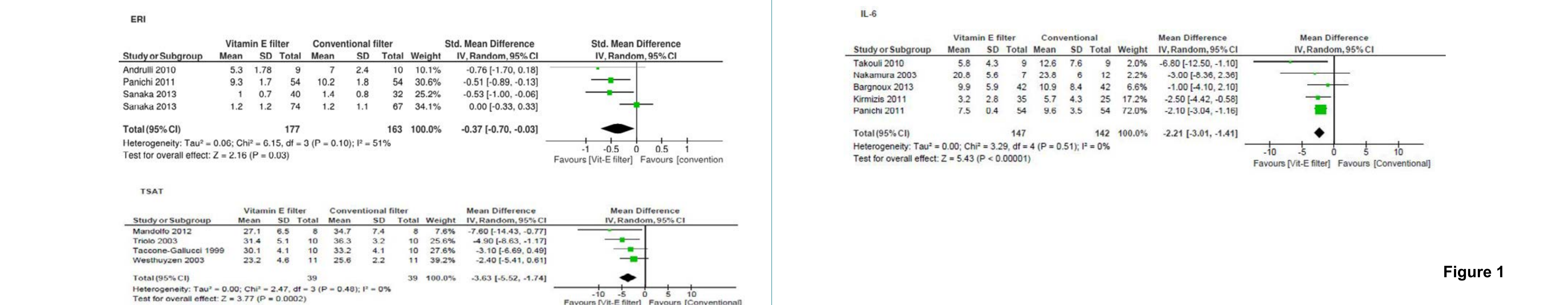


Figure 1

## Conclusions

In chronic hemodialysis patients, VEMs treatment seems to improve oxidative stress and inflammation whereas has apparently no impact on other dialysis parameters. Benefits of these membranes on anemia control and harder clinical outcomes are uncertain and need to be confirmed in future, targeted trials.