 

# The effect of hormone therapy on the ocular surface and intraocular pressure for postmenopausal women

## A systematic review and meta-analysis of randomized controlled trials

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Received 24 December, 2019

Revised 9 March, 2020

Accepted 9 March, 2020

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This abstract was presented in the 24th Congress of Chinese Ophthalmological Society.

Funding/support: This project was supported by National Science and Technology Major Project (numbers 2018ZX10101004) from Ministry of Science and Technology of the People's Republic of China. The sponsor of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Financial disclosure/conflicts of interest: None reported.

Supplemental digital content is available for this article. Direct URL citations are provided in the HTML and PDF versions of this article on the journal's Website (www.menopause.org).

Menopause: June 08, 2020 - Volume Publish Ahead of Print - Issue - doi: 10.1097/GME.0000000000001559

## Abstract

### *Objective:*

The aim of the study was to investigate the impact of hormone therapy (HT) on the ocular surface and intraocular pressure in postmenopausal women.

### *Methods:*

This systematic review and meta-analysis was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses Statement. PubMed, EMBASE, Cochrane Library of Systematic Reviews, Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, Chinese Biomedical Literature Database, and China National Knowledge Infrastructure were searched from inception to November 2019 without language restrictions. Only randomized controlled trials that evaluated the impact of HT on the ocular surface and intraocular pressure in postmenopausal women were eligible. The trials had to report at least one of the following outcomes: break-up time, Schirmer test, corneal staining, ocular surface symptom score, and intraocular pressure. Two investigators independently extracted the information, assessed the risk of bias, and evaluated the publication bias. All data were analyzed by Review Manager V.5.3. Sensitivity analysis and subgroup analysis were performed to find the source of heterogeneity and evaluate the different effects among subgroups.

### *Results:*

Nine randomized controlled trials (N = 612) were included. The HT group showed significant improvements compared with the control group in break-up time (mean difference [MD] = 2.09, 95% confidence interval [CI] 1.00-3.19, P = 0.0002), Schirmer test without anesthesia (MD = 4.17, 95% CI 1.55-6.80, P = 0.002), Schirmer test with anesthesia (MD = 1.44, 95% CI 0.71-2.18, P = 0.0001), and corneal staining scores (standardized mean difference [SMD] = −0.85, 95% CI −1.39 to −0.30, P = 0.002). Moreover, significant beneficial effects were observed on all four symptoms, including dryness (SMD = −1.21, 95% CI −1.99 to −0.44, P = 0.002), foreign body sensation (SMD = −1.02, 95% CI −1.29 to −0.76, P < 0.00001), ocular fatigue (SMD = −1.74, 95% CI −2.12 to −1.36, P < 0.00001), and burning (SMD = −0.53, 95% CI −0.78 to −0.29, P < 0.0001) after HT. Subgroup analysis revealed that, in terms of break-up time, postmenopausal women younger than 55 years achieved more improvements (MD = 0.88, 95% CI 0.16-1.59, P = 0.02) than women older than 55 years old (MD = 2.60, 95% CI −1.34 to 6.55, P = 0.20), and the estrogen subgroup received more benefits (MD = 3.11, 95% CI 0.93-5.30, P = 0.005) than the estrogen plus progestogen subgroup (MD = 0.42, 95% CI −0.02 to 0.85, P = 0.06). Sensitivity analysis and subgroup analysis suggested that the heterogeneity might derive from the methodological quality, the age of participants, and the intervention of the control group. Intraocular pressure (MD = −1.54, 95% CI −3.39 to 0.32, P = 0.10) was not evidently decreased after HT. No more specific adverse events (relative risk = 1.66, 95% CI 0.41-6.77, P = 0.48) were found in the HT group.

### *Conclusions:*

Our study revealed that HT could improve ocular surface function in postmenopausal women effectively and safely, especially for those who were younger than 55 years, and estrogen only showed more improvements than estrogen plus progestogen. The effectiveness of HT in treating dry eye in postmenopausal women is, however, still a controversial topic. In addition, we did not find HT led to a significant reduction of intraocular pressure.