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INTRODUCTION

Retinal vascular occlusion is an ophthalmic emergency associated with irreversible vision loss. A biologically plausible link between systemic hormonal therapy and retinal vascular occlusion exists; however, this relationship remains understudied.

This review aims to synthesize the available evidence and characterize this association.

METHODS

Search Strategy

A comprehensive search was conducted across MEDLINE, Embase, the Cochrane Library, Compendex, Web of Science, Scopus, Cumulative Index to Nursing and Allied Health Literature, and ClinicalTrials.gov from database inception to November 2025.

Inclusion and Exclusion Criteria

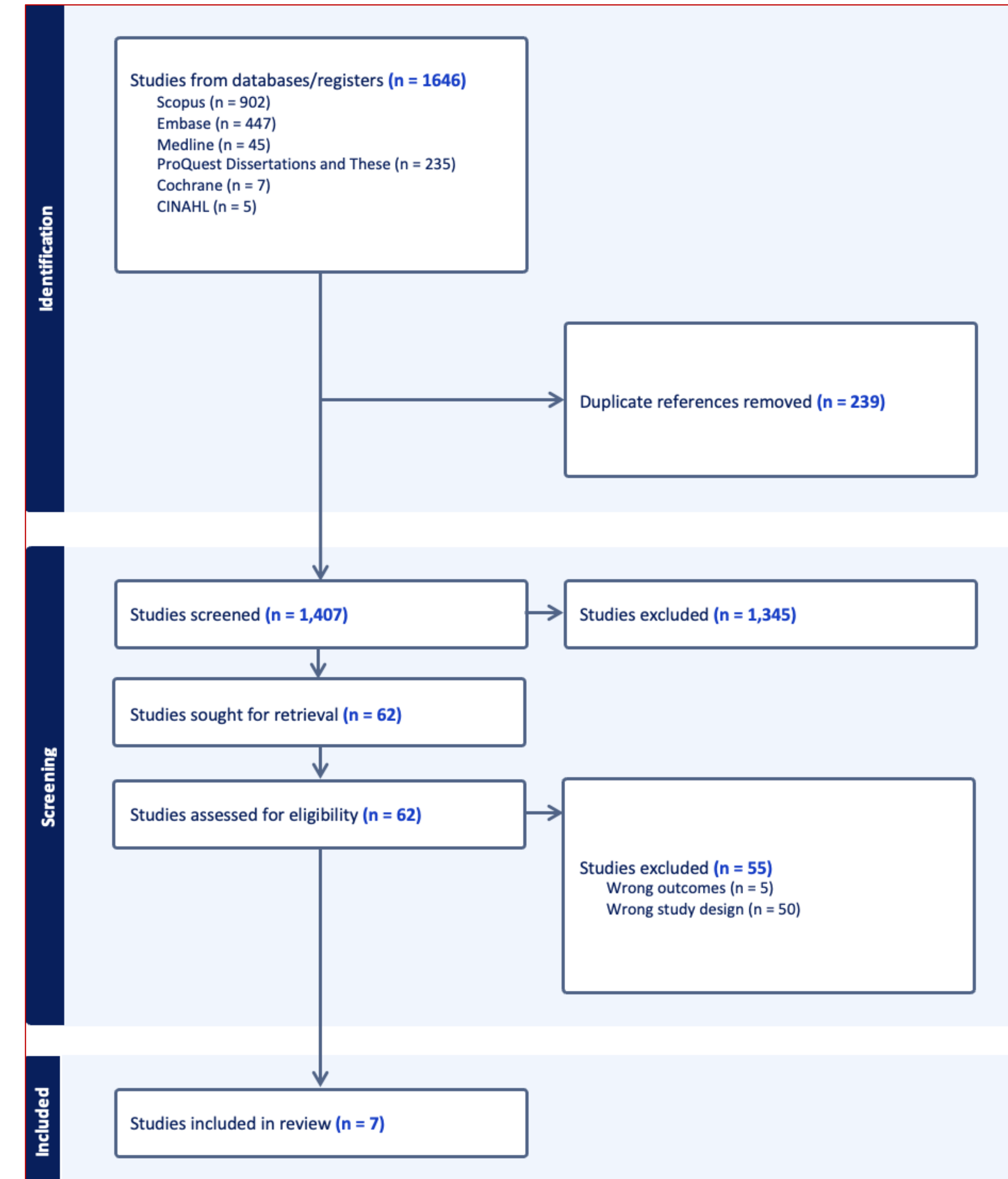
Studies were included if they: (1) reported primary, original research; (2) included women exposed to hormonal therapy (e.g. oral contraceptives, hormone replacement therapy, selective estrogen receptor modulators or aromatase inhibitors) either as a primary or stratified subgroup; (3) reported retinal or ocular vascular outcomes; and (4) included ≥ 10 participants.

Studies were excluded if they did not report female-specific or sex-stratified outcomes or were limited to pediatric populations. Ineligible hormonal exposures included topical/ intraocular/vaginal hormone therapies, or non-systemic exposures.

Data Synthesis and Analysis

We investigated the incidence of retinal vascular occlusion in association with hormone therapy use. Effect estimates were pooled using random-effects model with restricted maximum likelihood estimation. Results are presented as pooled risk ratios (RRs) and hazard ratios (HRs) with 95% confidence intervals.

RESULTS



PRISMA Flow Diagram.

Study Selection and Characteristics

Characteristic	Patients, n
Country, n (%)	5,534,531
United States	3 (43)
South Korea	1 (14)
Denmark	1 (14)
Italy	1 (14)
United Kingdom	1 (14)
Type of Hormone Therapy, n (%)	
Aromatase inhibitors	1 (14)
Estrogen receptor modulators	1 (14)
Hormone replacement therapy	1 (14)
Combined oral contraceptive pill	3 (43)
Progestin-only oral contraceptive pill	1 (14)
Intrauterine device implants/injections	1 (14)
Vaginal ring	1 (14)
Unspecified	2 (29)
Type of Vascular Occlusion, n (%)	
Retinal artery	7 (100)
Retinal vein	6 (86)

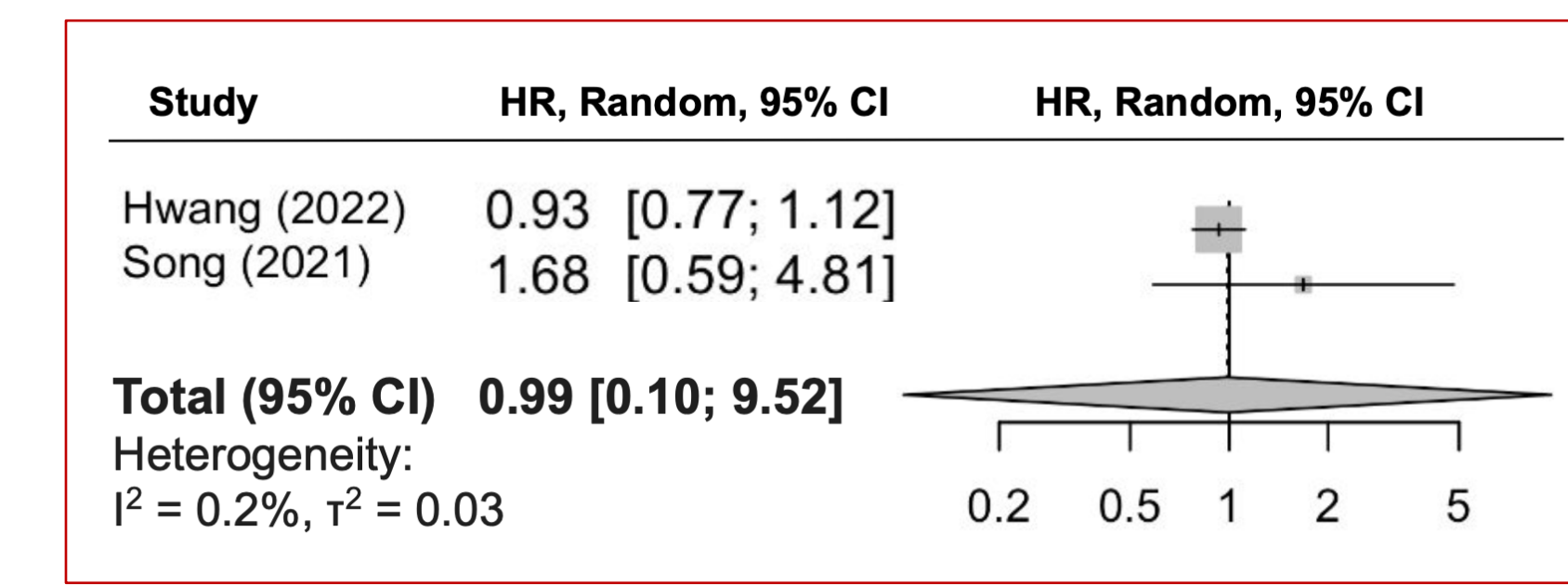
Characteristics of Included Studies.

Study	Findings
Hwang 2022 HRT, OCP vs RAO/RVO	NS
Scoditti 1998 Not specified vs RAO/RVO	NS
Vessey 1998 OCP vs RAO/RVO	NS*
Song 2021 Not specified vs RAO/RVO	NS
Gorin 2005 Tamoxifen vs RAO/RVO	NS
Feng 2024 Aromatase inhibitors vs RAO	Anastrozole - NS Letrozole - Sig Exemestane - Sig
Niazi 2025 Combined OCP, patch, and vaginal ring; progestin-only OCP, IUD, implants/injections vs RAO/RVO	Sig (dose-dependent association)

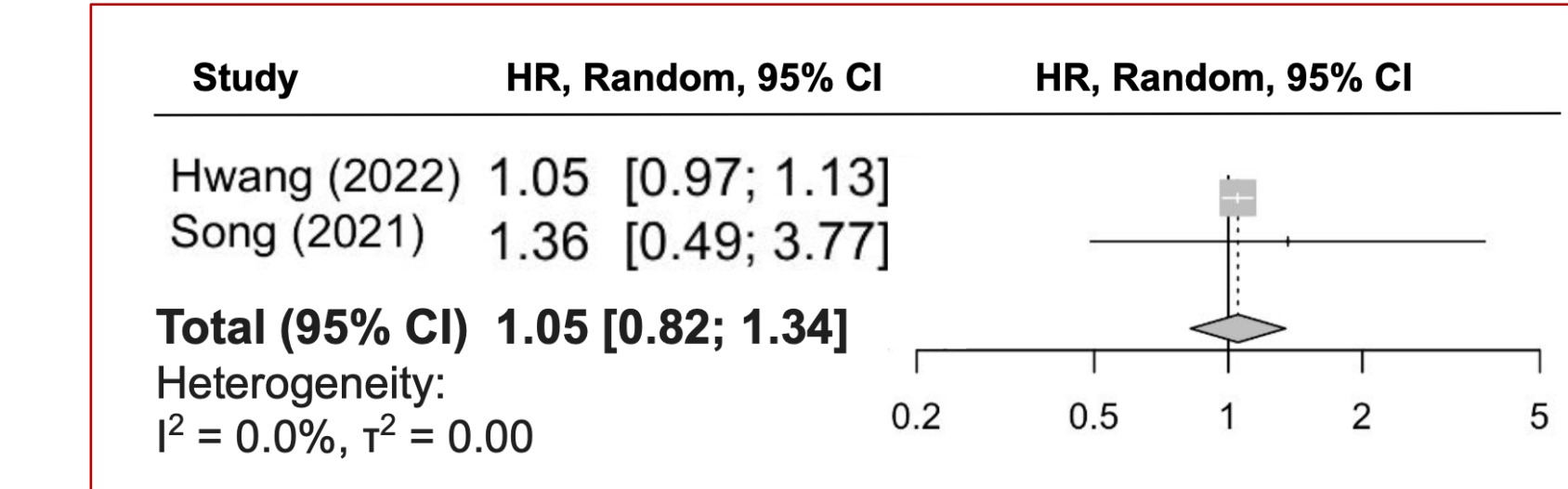
NS = not statistically significant; NS* = elevated point estimate but wide CIs crossing null; Sig = statistically significant

Summary of Findings.

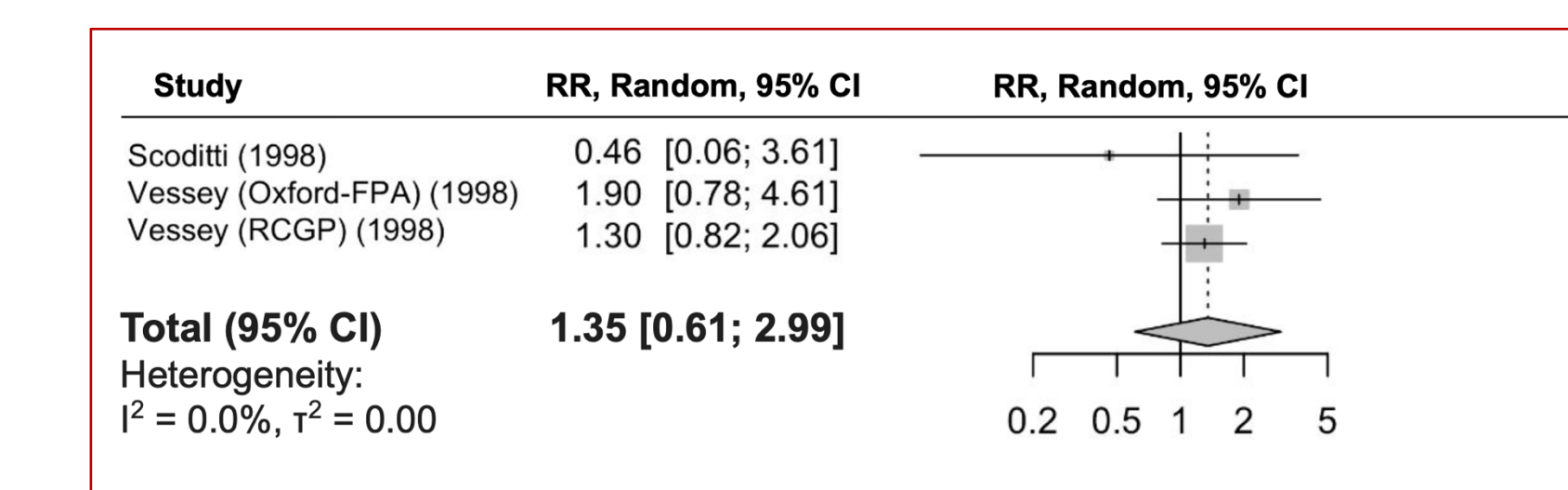
Association Between OCP Use and Retinal Vascular Occlusion



Pooled HR for hormone therapy use x RAO



Pooled HR for hormone therapy use x RVO



Pooled RR for hormone therapy use x retinal vascular occlusion

CONCLUSION

These findings reflect a sparse, underpowered, and methodologically heterogeneous evidence base rather than a true absence of association.

The dose-dependent relationship identified in the most rigorous available study, situated alongside the recognized prothrombotic mechanisms of exogenous estrogen, supports the need for large, prospective studies with pre-specified outcomes and sex-stratified analyses.

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