

Comparative Effectiveness and Safety of Abaloparatide and Teriparatide in the Treatment of Osteoporosis in Postmenopausal Women: A Systematic Review and Meta-analysis

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Background

- Osteoporosis is characterized by loss of bone mass, which increases the risk of fractures^[1].
- Age-adjusted prevalence of osteoporosis aged 50 and over was 12.6%, the prevalence in women is higher than that in men (19.6% vs 4.4%)^[2], largely due to menopause serving as a significant risk factor.
- Abaloparatide, a novel synthetic analogue of human parathyroid hormone-related peptide, appears to have better efficacy and safety than teriparatide^[3], which has the same mechanism of action.
- To date, no systematic review and meta-analysis is conducted to examine the effectiveness and safety of abaloparatide compared teriparatide.

Objective

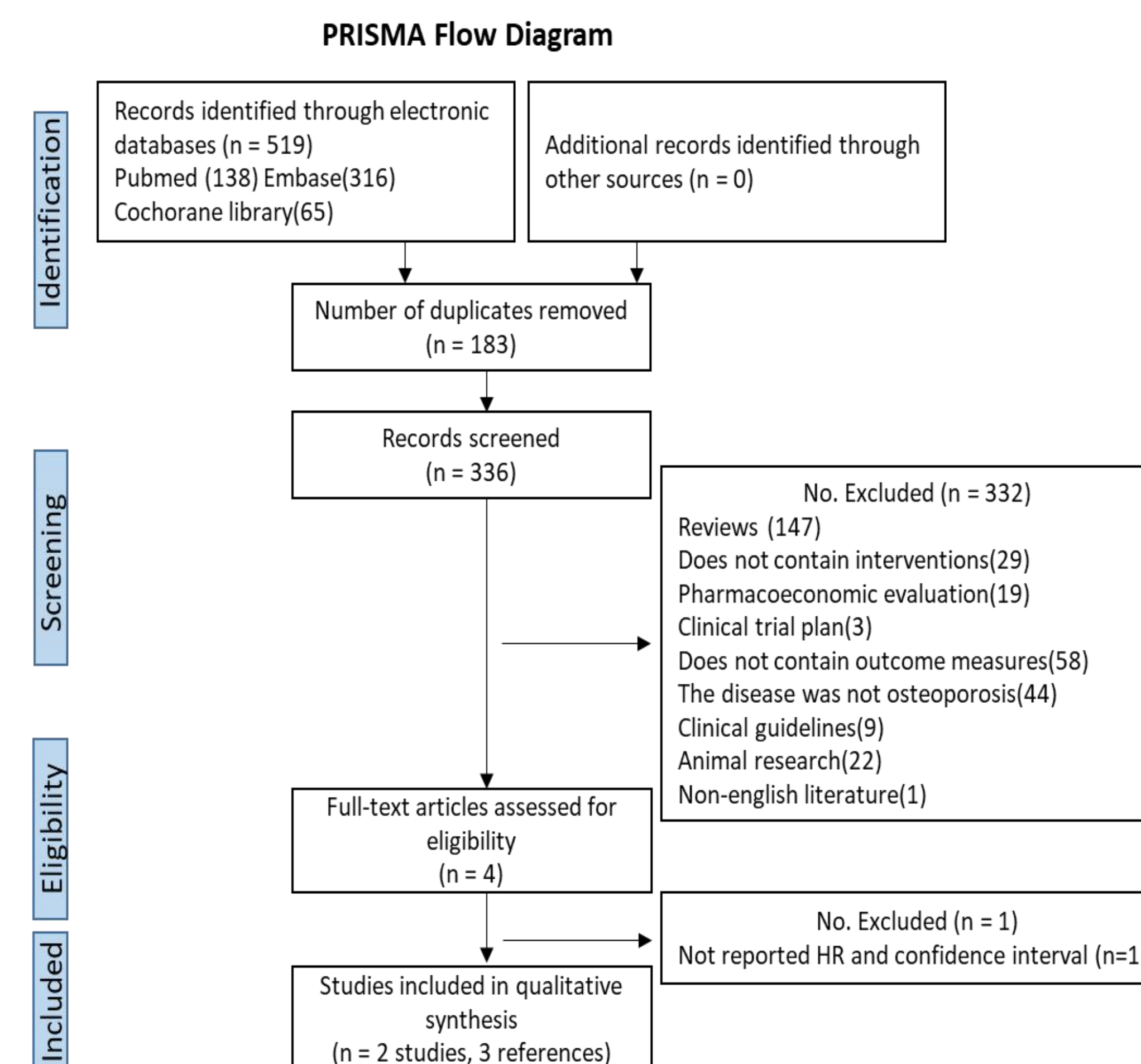
- To conduct a systematic review and meta-analysis to evaluate the effectiveness and safety of abaloparatide compared to teriparatide in treating osteoporosis in postmenopausal women.

Methods

- PubMed, Embase, Cochrane library, and www.clinicaltrials.gov databases were searched from database inception to April 2023.
- Review Manager 5.4 was applied to perform the meta-analysis and random-effects models were used to derive pooled estimates.
- Randomized controlled clinical trials and observational studies were assessed using the Cochrane Risk of Bias Tool and the Newcastle-Ottawa Scale, respectively.

Results

- Two studies (N=24,874) were included, one was an international multicenter clinical trial and the other was an observational study.

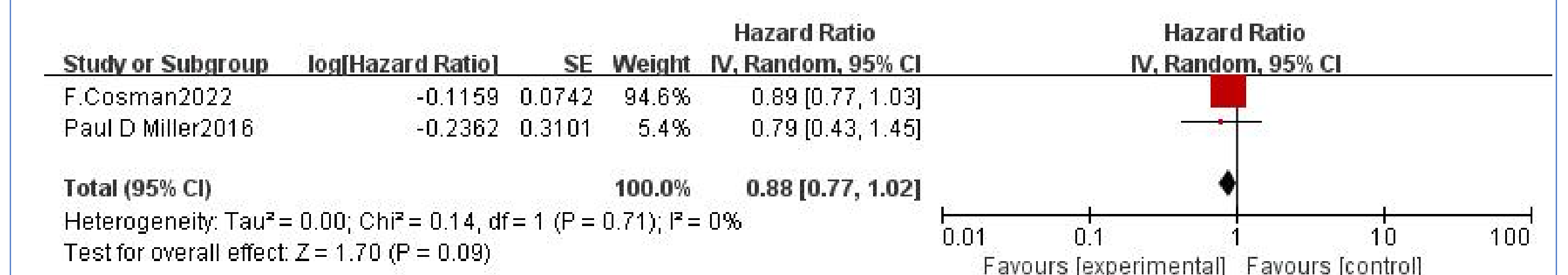


study name	group	number of patient	dose and frequency	Follow-up
Paul D Miller2016	abaloparatide	824	daily subcutaneous injections 80µg	19months
	teriparatide	818	daily subcutaneous injections 20µg	19months
F.Cosman2022	abaloparatide	11616	NA	19months
	teriparatide	11616	NA	19months

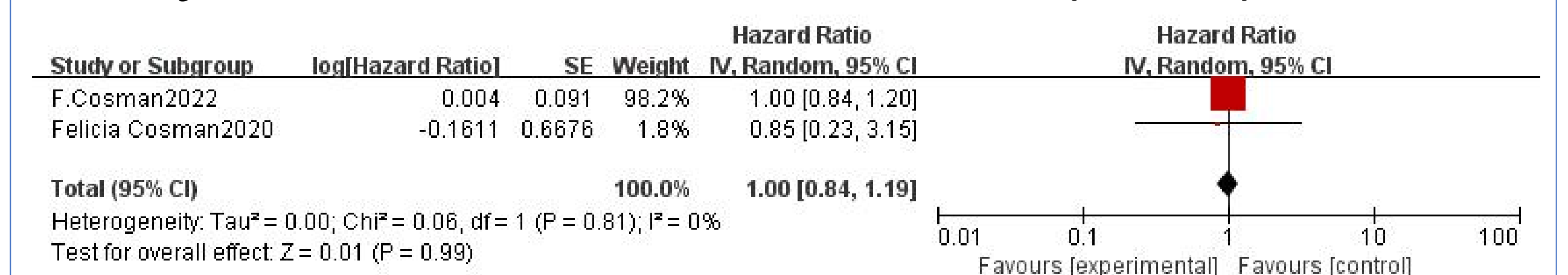
- Compared with teriparatide, abaloparatide had no significant difference in reduction in
- Non-vertebral fractures (pHR)=0.88, 95%confidence intervals (CI): 0.77-1.02, I²=0%)
- Major adverse cardiovascular events (MACE) (pHR=1.00, 95%CI: 0.84-1.19, I²=0%)
- A composite outcome of MACE and heart failure (HF) (pHR=1.05, 95%CI: 0.93-1.19, I²=0%).

Results

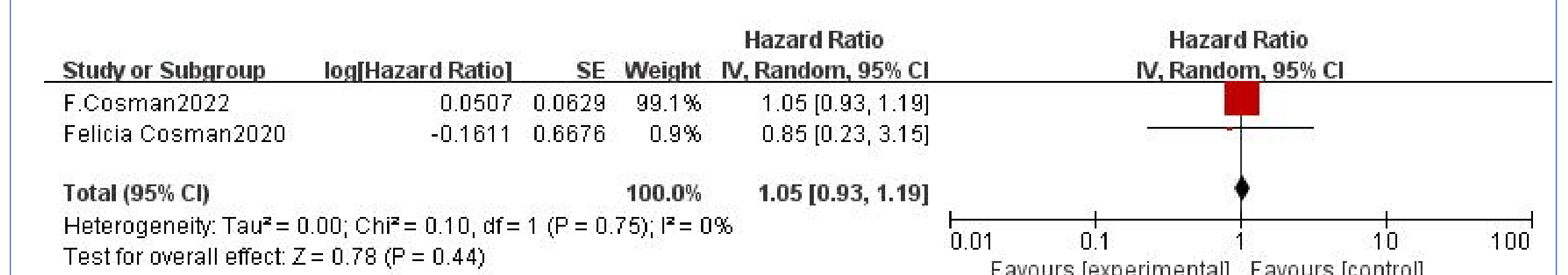
- Non-vertebral fractures



- Major adverse cardiovascular events (MACE)



- A composite outcome of MACE and heart failure (HF)



Conclusion

- The findings suggest that abaloparatide is not significantly different from teriparatide in reducing non-vertebral fractures and safety with regard to cardiovascular events in postmenopausal women with osteoporosis.
- Due to the lack of head-to-head studies comparing abaloparatide and teriparatide, further research is needed to evaluate the comparative effectiveness of the two treatments on other important outcomes including vertebral and hip fractures.

References

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