

# Investigating the Relationship between Exogenous Hormone Therapies and Meningioma Incidence Among Women

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## Introduction and Objective

Meningiomas occur twice as often in women as in men, indicating that sex hormones may significantly influence their growth and development. Long-term estrogen or progesterone hormone replacement therapy (HRT) and oral contraceptive use may be a risk factor for their development. However, the literature has not reached a consensus on this association.

This study aims to elucidate the relationship between exogenous hormone therapy and meningioma incidence among women.

## Methodology

Following PRISMA guidelines, a systematic literature review articles published from 2000 to July 2024 was conducted, followed by a literature impact analysis.

PubMed/MEDLINE and EMBASE were searched for articles using the following search terms: “hormone replacement therapy”, “birth control”, “oral contraceptives OR oral contraception”, “contraceptives OR contraception”, “estrogen”, “progesterone”, “menopause”, and “meningioma”. No language restriction was applied to the search.

Two independent researchers screened and adjudicated all search results using Covidence with each screener being blinded to the decision of the other. In the event of any disagreements about the eligibility of an article, a third researcher acted as a tiebreaker.

The inclusion criteria focused on original research discussing exogenous hormone therapy use among women, excluding non-human research, non-meningioma pathologies, and other non-relevant publications.

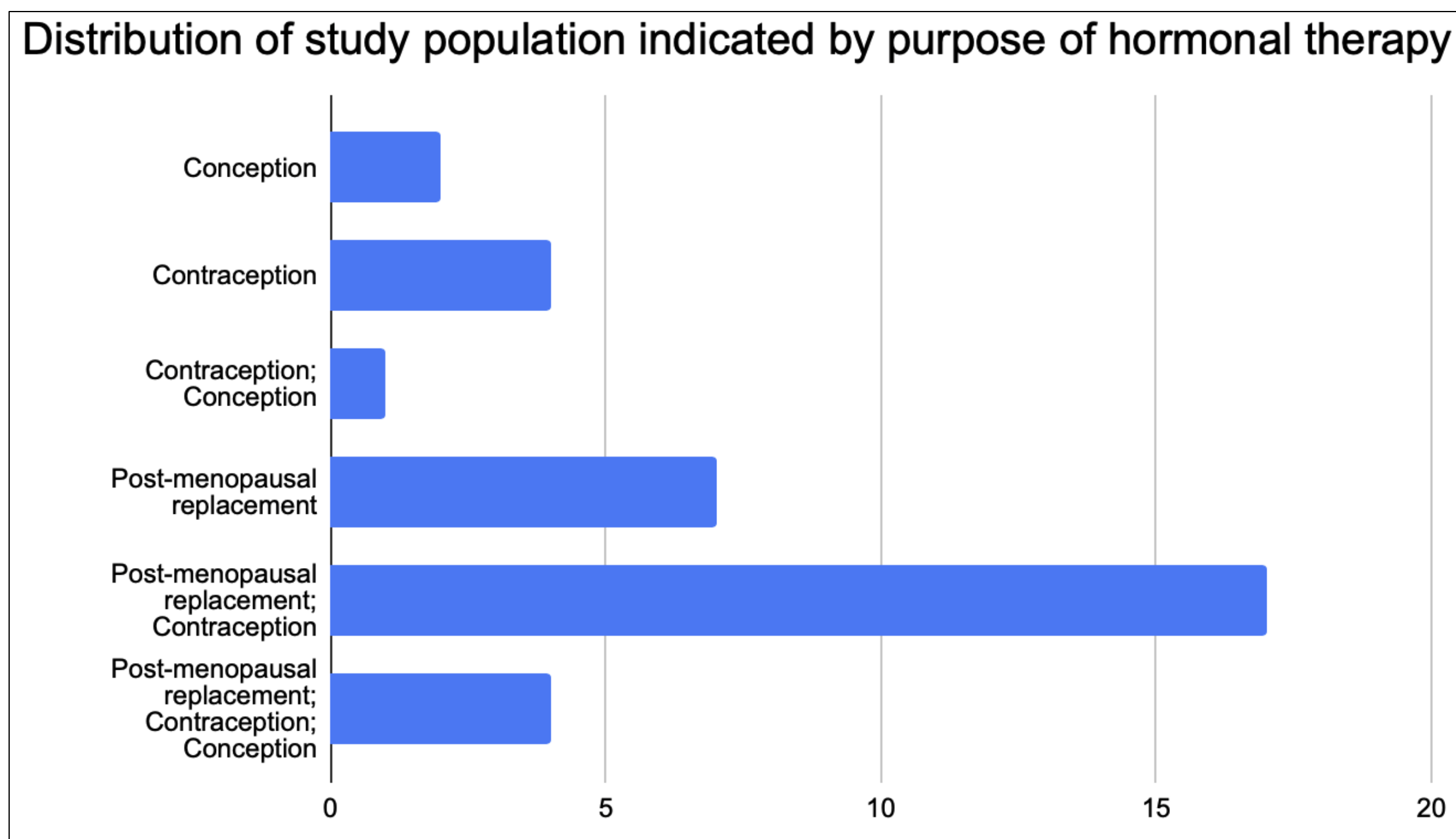


Figure 1: Distribution of studies based on the study population as defined by the purpose of hormonal therapy

## Results

A total of 32 papers met the inclusion criteria and 11 (34%) were authored by principal authors affiliated with US institutions. The three most represented countries outside the US were China (3), Denmark (3), and France (6) (**Figure 1**). The median number of citations was 21.5 and the median RCR was 1.52.

Primary use cases for exogenous hormone therapy were contraception, postmenopausal replacement, and hypofertility with other cases including dysmenorrhea and polycystic ovary syndrome. Interestingly, some studies also looked into the association of hormone usage for conception purposes (**Figure 2**). Hormones used by patients included estrogen, progestin, combinations, estradiol, and cyproterone acetate.

Cumulative odds ratios indicated no significant association between any exogenous hormone intake and meningioma risk except for a slight protective effect. Notably though, meningiomas in women taking exogenous hormones were seen to be located primarily in the sphenoid-orbital region with a resulting increased prevalence of visual symptoms.

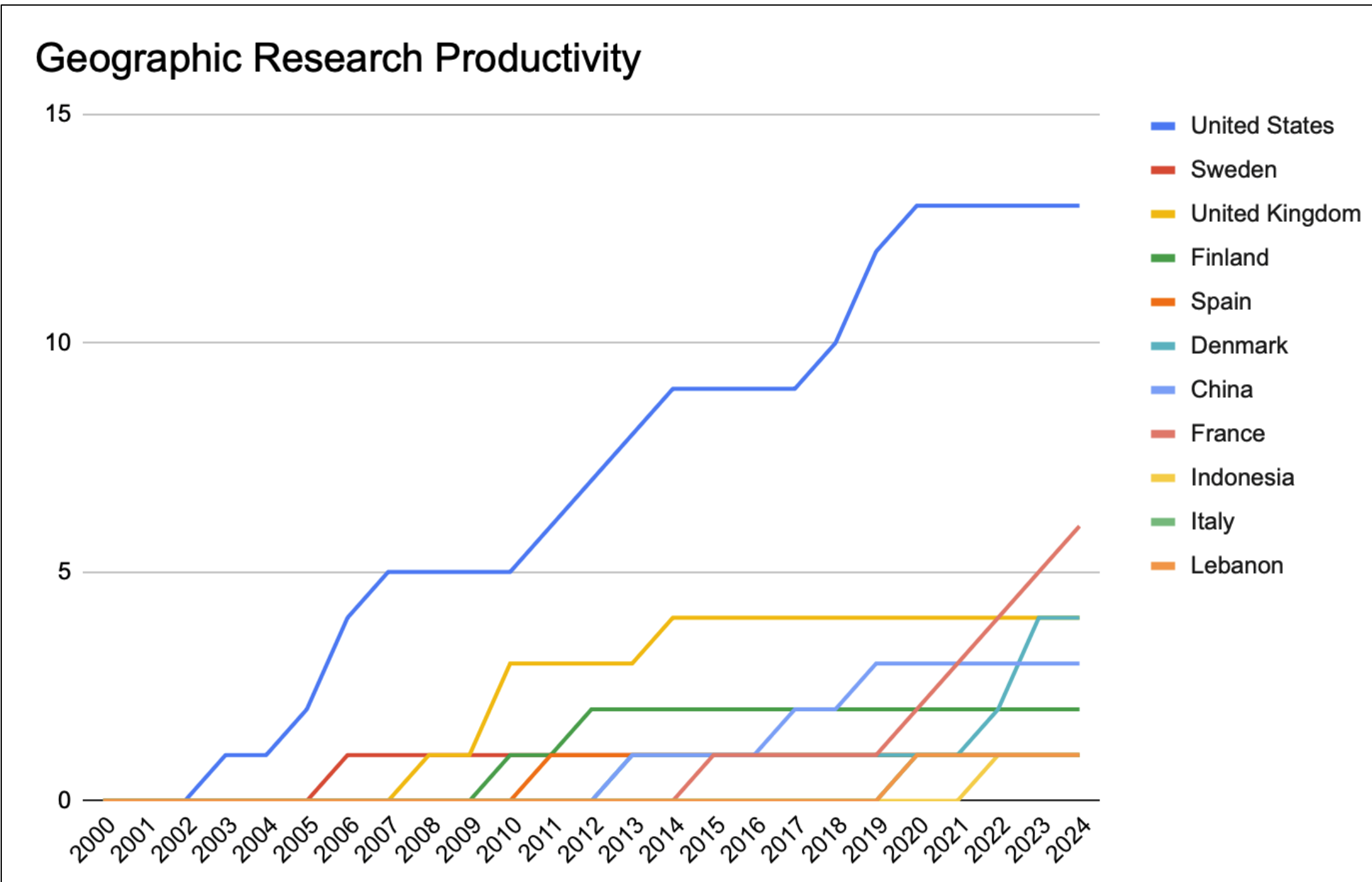


Figure 2: Timeline of productivity by manuscript numbers according to country

## Conclusions

This study indicates that exogenous hormone therapies may not be associated with an increased risk of meningioma in females. However, clinical implications of such therapies may present for women with ailments relating to irregular hormonal function such as endometriosis and hypo-fertility. Additional analysis should also be conducted via stratification of patients by menopausal status to further elucidate and clarify the role of exogenous hormone use in women. Further clinical studies should be conducted to validate the conclusions of this study.

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