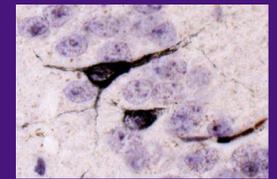


Alzheimer's Disease & Hormone Replacement Therapy Is There a Link in Women?



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Research Question

1. Does using hormone replacement therapy (HRT) post-menopause have an effect on the manifestation of Alzheimer's disease in women?
2. Do the risks of hormone replacement therapy outweigh the benefits?
3. How does hormone replacement therapy affect the physiology of the brain?
4. What should be recommended to women in regards to the use of hormone replacement therapy?

Introduction

How can we separate science from pop culture, understand the media and its influence, and objectively determine whether or not hormone replacement therapy is a good alternative to relying on natural hormones post-menopause?

- HealthDay: News for Healthier Living reports risks outweigh benefits
 - Heart disease, stroke, blood clots, and cancer vs. healthy cognition
- Fox News reports that those who use HRT within five years of menopause are 30 percent less likely to develop Alzheimer's disease
- On National Public Radio's "Science Friday" program Dr. Roberta Diaz Brinton from USC stated that 2/3 of those affected by Alzheimer's disease are women and that menopause is a neurological transition.

The Conflict

Women use HRT to supplement the decrease in hormones that occurs in menopause and to alleviate associated symptoms. HRT improves the quality of life for women during this transitional period. If HRT is shown to be an agent that better the effects of menopause and allows for healthier cognition, is it worth risking all of the other potential health complications?



Aging

- Aging is defined as the cumulative process of growing old
- Cognitive aging is "concerned with the basic processes of learning and memory as well as with the complex higher-order processes of language and intellectual competence or executive functioning" (Schaie).

Alzheimer's Disease

- Alzheimer's disease: a form of dementia that has a relationship to decline in memory, thinking, and behavior
- Symptoms: difficulty in remembering recently learned things as well as disorientation, mood and behavior change, confusion, intense memory loss, and, eventually, difficulty speaking, swallowing, and walking
- Plaques and Tangles (see images above)
 - plaques are the build-up of protein fragments (beta-amyloid)
 - tangles are twisted fibers (tau)
 - both buildup in/around nerve cells and disturb the firing of signals
 - Use it or lose it

Hormone Replacement Therapy

According to information provided by the American Academy of Family Physicians, hormone replacement therapy (HRT) is a "treatment where the body is given hormones to prevent or treat certain medical conditions." This study will focus on its use in the treatment of menopause. The Women's Health Initiative has studied the use of HRTs extensively. The hormones administered are types of estrogen, progesterone, or progestin. My study will combine and assess all of the findings to reveal the risks and benefits of such therapy.

Published Results and Implications

Study findings have been varied and inconsistent:

- Ex: Risk of developing the disease and dementia was significantly reduced in estrogen users; risk decreased with increased dosages and duration (Paganini-Hill 1996)
- Ex: HRT reduced the onset of dementia by 34%
- Ex: Results confounded by circumstances like small size of test groups, absence of placebo, and nonrandom design.

It is my hope that with a well-designed meta-study and an acute attention to detail, I can determine whether or not the gross outcome is worth the potentially negative effects of HRT.



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Methods – Literature and Data Review

- Topics: cognitive decline, Alzheimer's disease, hormone replacement therapy, women's health, aging, menopause, biology, psychology, endocrinology, and other related topics
- Databases: CSU Stanislaus article database, the American Psychological Association, and *Science Magazine*
- Analyze the information collected (qualitative and quantitative)

Method – Meta-Analysis

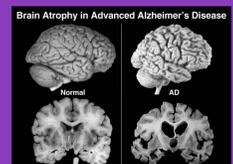
- Reproducible, systematic, and valid
- SPSS (Statistical Package for the Social Sciences)
- Averages, confidence intervals, statistical significance using tests like the two independent samples t-test, the chi squared goodness of fit test, binomial tests, and ANOVA
- Conceptualize the information such as the populations, methods, procedures, and design of the research
- Factor in multiple outcomes per study, multiple measurement points per outcome, and sub-samples in the population

Schedule

Spring 2015 – Data and information collection; Literature review
 Summer 2015 – Sort, review, analyze, and select pertinent studies; Gain understanding of meta-analysis process; IRB
 Fall 2015 – Perform meta-analysis; Analyze data; Outline paper; Combine findings from literature review and meta-analysis
 Spring 2016 – Finalize article, Peer review and advisor review; Complete paper and present findings

Significance

- Application in neurophysiological practices
- Further research and medical advancements
- Use in pharmaceutical and diagnostic practices
- Daily health and lifestyle choices



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