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Efficacy of Pharmacologic Treatment for Orthostatic Hypotension in the Elderly Population

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Abstract

The purpose of this literature review is to determine the efficacy and safety of pharmacologic treatments for orthostatic hypotension (OH), with an emphasis on researching the elderly population. In this review, three electronic search databases were utilized including PubMed, Google Scholar, and Dynamed from the years 1997 to 2019. Several keywords were used during the search. The specific pharmacologic agents researched for the treatment of OH included midodrine, droxidopa, pyridostigmine, and fludrocortisone. Although midodrine is the most researched and utilized pharmacologic treatment of OH, this drug may not be the best option when it comes to treatment in the elderly population due to an increase in supine hypertension. Pyridostigmine in combination with low-dose midodrine was found to be effective in relieving OH symptoms without increasing supine hypertension, but this evidence is based on limited randomized trials. More research is needed in order to evaluate the efficacy and safety of these pharmacologic measures in the treatment of OH specifically in the elderly population and over a long period of time.

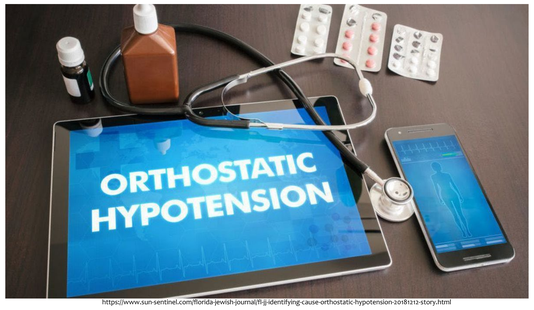
https://healthbeat.spectrumhealth.org/her-mission-keep-seniors-fall-free/

Statement of the Problem

The United States' population is continuously aging with around 12% of the population over the age of 65. This number is projected to increase to 17% over the next few decades (U.S. Census Bureau, 2018). Due to this, the contribution of OH to falls and mortality in the United States is likely to increase. Although OH is a common condition in the elderly population affecting nearly 20% of those over age 65, it is often overlooked and not treated effectively. The estimated cost due to falls on the health system is 23 billion dollars annually (Juraschek et al. 2016). Proper treatment of OH could decrease hospitalizations and overall mortality rates from preventable falls, thus decreasing costs in these areas. Primary care providers need to be informed on the safest and most effective treatment options for this condition, whether that is non-pharmacological interventions or drug treatments.

Research Question

Does adding pharmacological treatment to patients' non-pharmacological interventions prove beneficial in reducing the likelihood of falls and mortality in the middle-aged (>50) or elderly (>65) populations diagnosed with orthostatic hypotension?



https://www.sun-sentinel.com/florida-jewish-journal/fl-jj-identifying-cause-orthostatic-hypotension-20181212-story.html

Literature Review

- Okamato et al. (2016) found abdominal binders to be an effective non-pharmacological measure to raise SBP in the elderly population (p=0.019). The only downfall to this method was that some patients reported the binders to be uncomfortable, so they were not compliant with use at all times.
- SHU and compression stockings were found to be ineffective interventions for the treatment of OH in studies done by Robinson et al. (2018) and Fan et al. (2011).
- Okamato et al. (2016), Low et al. (1997), and Smith et al. (2016), found midodrine to be effective at improving both standing SBP and symptoms such as lightheadedness in the elderly population (p=0.010, p=0.02, p=0.01, respectively). The major adverse event that occurs with midodrine is an increase in supine hypertension.
- Elgebaly et al. (2016) and Kaufmann et al. (2014) both found droxidopa to be effective at increasing SBP upon standing in the short-term.
- Rowe et al. (2001) found that while fludrocortisone increased SBP in those with OH, it was not significant when compared to the placebo (p=0.76). In addition to this, Grijalva et al. (2017) found fludrocortisone users more likely to be hospitalized than midodrine users.
- Singer et al. (2006) and Byun et al. (2017) found pyridostigmine to be effective at improving OH and symptoms associated with the condition (p=0.04, p=0.03, respectively). It was even more effective when paired with a low dose of midodrine, and in doing so it still did not affect supine blood pressure as much as midodrine alone.

Discussion

There is a lack of age-specific evidence in regard to the pharmacologic treatment of OH in the elderly, and further studies need to be done in this population to determine the efficacy and safety of these drug treatments. It is important to note that many individuals in this population have underlying supine hypertension.

Due to this, non-pharmacological measures should be maximized first while trying to treat OH. Pharmacological measures, such as pyridostigmine and low-dose midodrine, should be used on a trial basis after this to see if it helps correct symptoms associated with OH.

Drug & MOA	Effective in improving SBP and OH symptoms?	Worsen supine hypertension?
Midodrine -alpha agonist that increases vasoconstriction the periphery	Yes	Yes
Pyridostigmine -acetylcholinesterase inhibitor that increases neurotransmission in baroreflex pathway. Improves OH during orthostatic stress	Yes	No
Droxidopa -Increases NE in periphery, therefore increasing vasoconstriction	Yes, in the short-term	Yes
Fludrocortisone- mineralcorticoid that works in OH by increasing plasma volume	No	No
Pyridostigmine + low-dose midodrine	Yes	No

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Applicability to Clinical Practice

Orthostatic hypotension is seen regularly in primary care, and it is often difficult to treat effectively in the elderly population. Shaw et al. (2019) and Mol et al. (2019) conducted studies showing the correlation between the presence of OH and the likelihood of falls in the elderly population. Both studies showed that those with OH were more likely to fall due to this condition than those without symptoms from OH. It is estimated that 23 million dollars annually is spent in the health care system due to falls (Juraschek et al., 2016). This literature review will benefit medical providers in how to treat orthostatic hypotension effectively in this population using evidence-based medicine. By doing so, patients will be healthier and safer. In addition to this, mortality rates and healthcare spending due to preventable falls may be decreased.

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