



3-5-2018

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Stage One Hypertension Pharmacology Initiation for Young Adults

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College of Nursing and Professional Disciplines

NURS 997: Independent Study

## Permission

Title            Stage One Hypertension Pharmacology Initiation for Young Adults

Department    Nursing

Degree         Master of Science

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Date            March 22<sup>nd</sup>, 2018

### Abstract

There is specific interest regarding the issue of hypertension management and guidelines because of the recent news worthy item of decreases in goal blood pressures established by the American Heart Association (AHA) and American College of Cardiology (ACC). Young adults are of specific interest with regards to this subject because there is an estimated 35% of the population currently living with hypertension in the United States (Muntner, et al. 2018). Young adults are not typically the first population that comes to mind when thinking about high blood pressure but essential hypertension often begins in the 20s to 30s with problematic outcomes later in life. Hypertension in persons over 65 is widely understood for increased risk of stroke and cardiac events but young adults (those aged 18-44) are not as well studied (Johnson, et al. 2014b). The new guidelines for hypertension from the AHA/ACC include a change from >140/>90 mm Hg as diagnostic for hypertension stage one to >130/>80 mm Hg. A ten point increase means roughly 30 million more adults in the United States will meet criteria for stage one hypertension or higher. With the influx of newly diagnosed individuals, HTN diagnosis, treatment, and management needs to include young adults as well as older adults. Young adults should be routinely screened for HTN and a target goal of <120/<80 mm Hg should be achieved for optimal health. Pharmacological interventions should also be initiated for this population with the same regard as their elder peers (Whelton, et al. 2018).

## Stage One Hypertension Pharmacology Initiation for Young Adults

### Background

Essential hypertension (HTN) is often referred to as the silent killer and is a medical condition that plays a large role in the impact of other diagnosis and their progression towards illness in the adult. HTN origination often begins at a younger age (20-40) because of various genetic, hormonal, and lifestyle risk factors but is not recognized as a problem until the person becomes older and has complications from the persistent elevations in blood pressure. Uncontrolled HTN causes vasculature damage throughout the body system and has a great impact on the bodies organs ability to work efficiently (Hamrahian, 2017). HTN is a huge national concern and it affects approximately 75 million persons in the United States currently and has an estimated economic impact of \$51.2 billion dollars annually (Wang, Grosse, & Schooley, 2017).

Current controversy exists in the medical guidelines regarding HTN diagnosis and treatment because of the recent report made by the American Heart Association (AHA) and American College of Cardiology (ACC). Prior to the statements made by the AHA and ACC, HTN guidelines were referenced from the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressures 7<sup>th</sup> and 8<sup>th</sup> reports (released in 2003 and updated in 2014). The major changes made by the AHA and ACC suggest blood pressure readings greater than 130mm Hg systolic and greater than 80 mm Hg diastolic as diagnostic for HTN stage one compared to the previous 140/90 mm Hg in JNC 7 and 8 (Whelton, et al., 2017).

In the United States it is estimated that one third of the adult population has hypertension and of those only 54% are well controlled. These individuals have a significant

increase in their risk of developing heart disease and ultimately dying from a cardiac event or stroke (Centers for Disease Control and Prevention 2018). Considering heart disease is consistently among the highest diagnosis for mortality rates in the U.S., hypertension is a key component to health prevention (Fang, Gillespie, Ayala, & Loustalot, 2018). According to the new guidelines established by the AHA and ACC in late 2017 there will be an estimated 45.6% of the population (over 100 million persons) that would qualify for a diagnosis of high blood pressure with 36.2% of them being recommended to receive pharmacological intervention to reduce their blood pressure (Muntner et al., 2018). Controversy remains in the literature about the diagnosis and treatment of HTN in those age 65 or less. With a change to the recent guidelines and the vast increases in younger persons being diagnosed with HTN, diagnostic criteria and pharmacological interventions will need to be adapted.

### **Case Report**

Patient information was obtained from a learning simulation during an on campus week by author at the University of North Dakota. Patient identifiers are fictional and do not represent an actual patient.

### **History**

Jane is a 60 year-old Caucasian female that resides in our local community. She presents to the clinic today for a three week follow up regarding a recent diagnosis of primary hypertension during which she was started on Lisinopril 20mg daily. Prior non-pharmacological interventions were unsuccessful in lowering her blood pressure below goal and she stated the desire to begin medication for her HTN. In between her yearly physical appointments she was instructed to increase her physical exercise, decrease sodium in her diet, and reduce stress in

her life, which she states was too difficult with her busy schedule and caring for her grandchildren. Over the last three weeks she has noticed that she has had a persistent dry cough that is very irritating and bothersome to her. Blood pressure readings at home have been obtained twice a day, in the morning before she takes her medication and in the evening before bed. Her average blood pressure readings from her log are 145/85mm Hg with a high of 162/88mm Hg and a low of 141/76mm Hg. When questioned about her family history she states that her brother and sister who are currently living both have had HTN for years and her father passed away in his 70's, which she thinks was because of "heart problems." Her mother is still living, and she denies any significant medical problems for her. Jane is a thirty pack year former smoker having quit ten years ago, takes a daily multivitamin, consumes caffeine daily, drinks three glasses of wine a week, no other significant medical history, and has no known drug allergies.

### **Physical Examination/ Review of Symptoms**

Upon examination Jane appears well-nourished, well-developed, and appears in no acute distress. Her affect is appropriate and she is alert and oriented times four. Vitals signs are as follows: BP 160/98, P 80, RR 20, O2 100% RA, T 98.6F, Weight of 163lbs BMI 27. Skin is warm and dry while being free of rashes or lesions. Heart rate and rhythm are regular with S1/S2 noted with no rubs, gallops, or murmurs. Lungs are clear to auscultation bilaterally and are without adventitious sounds. Her cranial nerves are grossly intact. During questioning of her review of symptoms she denies headaches, visual changes, fevers, chest pain, shortness of breath, swelling, numbness/tingling, syncopal episodes, dizziness, and changes in mood. Other significant review of symptom items are included in her history of present illness.

**Diagnosis**

Patient continues to have elevated blood pressures at home as well as in the office setting. Per the JNC 8 guidelines, goal blood pressure for this patient is <150/90mm Hg. Since she is a 60 year-old with no other comorbidities, initial treatment should be with the use of an ACEI, ARB, CCB, or a thiazide diuretic (Joseph, 2018). This patient is most likely suffering from a cough induced by her ACE inhibitor and the best approach would be to stop her current Lisinopril prescription.

**Treatment/Follow Up**

Jane will be instructed to stop her current medication of Lisinopril since it is the most likely cause of her current cough and a new prescription of Losartan 50mg PO daily will be initiated. A prescription for 81mg aspirin will also be started for this patient to reduce her risk of cardiac events. She will follow up in three months to determine her blood pressure control and adherence to the new medication regiment. Other education for patient would include weekly home monitoring of blood pressure, limiting sodium in her diet, and medication adherence. She should continue to not smoke and keep her alcohol consumption at or below one ounces per day. Lab work for initiation of medication was noted from her yearly done three weeks prior and kidney/liver function will be monitored at her yearly appointments (Domino, Baldor, Golding, & Stephens, 2017).

**Literature Review**

Hypertension is estimated to begin in most adults around their twenties and thirties and leads to a vast number of complications within the human body and is the most preventable comorbidity that triggers death in the United States (Johnson et al, 2014b). Death from HTN



and its implications occurs at an average of 1,000 persons every day and has most recently taken nearly 400,000 American lives in the year 2013 (CDC, 2018). The largest concern for elevated blood pressures across a lifespan is the impact it has on our cardiovascular system, with financial burdens surpassing \$300 billion per year (Wang, Grosse, & Schooley, 2017). Longer periods of uncontrolled blood pressure equates to an increased risk of dying from a cardiac event and 47% of all cardiac events worldwide are attributed to HTN. In the United States there is an estimated 35% of persons under 65 who have HTN. Include this data with the national changes in HTN guidelines, and we are guaranteed to nearly double the young adults meeting the criteria for a HTN diagnosis and consideration for pharmacological intervention. Young adults age 20-44 will see an increase from 10.5% with JNC 8 to 24% with AHA/ACC and ages 45-54 jump 29.5% to 47.1% (Muntner et al., 2018). Another alarming factor is that this special population has the worst blood pressure control at around 38% compared to elder adults who are typically controlled >60% of the time. Poor control of HTN in the young adult increases their risk of strokes, kidney disease, and a whole plethora of other life threatening diseases throughout their lifetime (Johnson et al., 2014a).

## **Methodology**

Literature was varied in the preference for early initiation of pharmacological interventions, versus lifestyle modification approaches. Search strategies for my questions began by using the University of North Dakota School of Medicine and Health Sciences library database. From this database PubMed, CINAHL, and Cochrane were accessed because of their ease of use and relevance to medical journal articles and studies. Using similar search techniques for each database I began with the keywords addressed in my questioning of the

case at hand. The keywords used for the searches were *hypertension, young adult, disease management, and pharmacology*. In addition to the databases selected I also referenced major organizations that are relevant to my research. The Centers for Disease Control and Prevention, American Heart Association, American College of Cardiology, and the U.S. Department of Health and Human Services Joint National Committee were all reviewed for guideline standards as well. References were narrowed down to the last five years of publishing and ten articles were selected for synthesis.

### **Synthesis of Current Literature**

Three articles discussed HTN in the younger adult and the barriers they face in regards to the evaluation, diagnosis, and treatment (including pharmacological interventions) often seen with young adults and HTN. Young adults are in fact a unique population when it comes to HTN because they currently account for 20% of the HTN criteria but are only being monitored and controlled at a rate of 36%. Their non-compliance increases the risk for medical costs, further complications, and mortality. This is especially interesting considering that once young adults initiate antihypertensive medication they have relatively good control rates of upwards of 70% (Johnson, Warner, Bartels, & LaMantia, 2017). Looking at the timing of diagnosis in young adults in relationship to the guidelines criteria of a blood pressure of >140/90 they also have a 33% slower diagnosis rate when compared to persons greater than sixty, even with the same blood pressure numbers. (Johnson, et al. 2014b). A further barrier this population faces is the ability to receive pharmacological interventions for their HTN diagnosis. Young adults have a 44% slower initiation of pharmacological intervention when compared to older adults. Some of the reasons as to why this occurs include limited education

by the provider, prescriber error, and patient rejection (Johnson, et al. 2014a). Significant barriers for the young adult exist because primary care providers are simply underserving them with the notion that HTN is an old person's disease. Primary care providers need to better understand HTN control in the young adult in order to tailor their needs towards wellness and longevity (Johnson, Warner, Bartels, & LaMantia, 2017). Providers also cannot assist in prevention like previously stated if they are missing diagnosis on a regular basis with a population that serves a large portion of individuals currently dealing with HTN (Johnson, et al. 2014b).

Another three articles tackled the issue of treatment for young adults once diagnosed with HTN and the issue of what the new HTN guideline numbers were going to do to the number of people being diagnosed. Findings were consistent with the belief that lower target numbers equated to a higher prevalence of HTN for citizens. Nearly 45.6% of current Americans are now considered to have HTN as compared to the 31.9% prior. The ten point threshold for blood pressure equated to a 15% increase in individuals qualifying for HTN. These numbers are alarming and mean many more young adults will be seeking medical attention for treatment (Muntner, et al. 2018) Once these individuals have a diagnosis of HTN they need to be monitored throughout a lifetime. An analysis of 2,990 patients from 18-39 concluded that shorter follow-up times lead to greater blood pressure control overall. This is also important to note because going against many of the other guidelines young adults are often seen the least often. This could be one intervention to overcoming the barriers faced by young adults. One to two month follow-up appointments resulted in 76% control compared to greater than six months being 13% (King, et al. 2017). In a study done from 2011-2015 using data acquired from

the Behavioral Risk Factor Surveillance System the researchers sought to understand HTN diagnosis and medication requirements. Roughly half a million participants responded to these surveys and 30% reported having been diagnosed with HTN and of those over 60% were on medication (Fang, Gillespie, Ayala, & Loustalot, 2018). This survey helps solidify the increasing proportion of overall adults having elevated blood pressures and the need for continued support, interventions, and control.

The search within COCHRANE provided one systematic review that guided pharmacology initiation for the young adult. For this review the authors addressed how HTN treatment is well known in the adult greater than 60 but what about all the adults that fall below this range? Their selection criteria for inclusion into the review had to be greater than one year and compared HTN medication versus placebo in adults less than sixty-years old. Their target blood pressure for goal was defined as less than 140/90 mm Hg. Overall, their conclusions were that there is a small reduction in absolute effect in cardiac mortality but there was no change in median mortality associated with cerebrovascular death. They suggest more studies need to be performed on young and middle aged adults in order to accurately determine antihypertensive use (specifically variations in medication classes) in this age group to reduce cardiovascular complications (Musini, Gueyffier, Puil, Salzwedel, & Wright, 2017).

The most recent clinical guidelines for HTN as outlined by the ACC/AHA and JNC 8 as well as a synopsis of current practice guidelines in 2018 dictate HTN goal treatment for young adults. In regards to age specific populations the ACC/AHA recommend any persons under the age of 60 should be initiating blood pressure lowering techniques to include pharmacological interventions when needed for readings greater than 140/90 mm Hg. This goal, which is in line

with the prior JNC 8 is only for adults who have no history of cardiovascular disease and whom have a less than 10% risk of ASCVD risk (Whelton, et al. 2017). If the young adult were to have any of these risk factors regardless of age their goal blood pressure would be the new standard of 130/90 mm Hg (Whelton, et al. 2017). The JNC 8 findings for young adults had a similar suggestion for pharmacological initiation in this population. In the otherwise healthy adult medication should be started for readings greater than 140/90 mm Hg as well but this is solely based on expert opinion and needs more randomized control trials within young adults to warrant better grading (James, et al. 2014). Current practice guidelines reiterated the same findings from JNC 8, AHA, ACC, and various other world organizations for young adults and pharmacological interventions to treat HTN (Joseph, et al. 2018).

### **Learning Points/Conclusion**

- Blood pressure goals for patients 18-39 years old should be <120/<80 mm Hg.
  - Current Organizations including the AHA and ACC have changed the diagnosis of stage 1 essential hypertension to a blood pressure reading of >130/>80. This change is likely to diagnosis 30 million more Americans than the previous guidelines (Whelton, et al. 2018).
- Age bias should be avoided at all costs when dealing with a diagnosis of HTN.
  - Elevated blood pressures affect people of all ages and the sooner and more frequently that it is detected and managed the greater the outcomes. It should no longer be considered a disease of “the old” and therefore be monitored and treated for all individuals. Only 36% of young adults diagnosed with HTN are being treated currently (Johnson, Warner, Bartels, & LaMantia, 2017).

- Antihypertensive initiation and medication treatment options are consistent with current guidelines in the young adult.
  - Further studies need to address the young adult population with consideration for pharmacological intervention to grasp a better understanding. Current guidelines include the young adult In the initiation of blood pressure lowering medicines and initiation beginning with numbers >140/>90 mm Hg (Whelton, et al. 2018).

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