KnE Life Sciences

ICHT 2019
Selection and Peer-review under the responsibility of the ICHT Conference Committee
Volume 2019

Knowledge E
enriching | engaging | empowering

Conference Paper

# Association between the Onset of Menopause and Hypertension among Elderly in Kamurang and Rawakuda Villages, Kedung Waringin Sub-District in 2019

**Iin Ira Kartika, Cusmarih, Sisca PriAndini**

Bhakti Husada Nursing School, Cikarang, Bekasi, West Java, Indonesia

## Abstract

**Background:** Menopausal women are more prone to have hypertension. Estrogen can cause narrowing of the arteries, which cause an increase in blood pressure. The impact of hypertension on older adults become a significant factor in the occurrence of stroke, heart failure, and coronary heart disease. The elderly who are more than 60 years old may die of heart and cerebrovascular disease. Add more support senetence to highlight the improrttance of your study. **Objective:** To determine the relationship between the age of menopause and hypertension in women in Kamurang and Rawakuda village in KedungWaringin sub-district, Bekasi regency in 2019. **Method:** This study uses a cross-sectional approach; the sampling technique used in this study is to a total sampling with 42 respondents. The variables in this study include dependence variable, namely hypertention while the independent variable is the age of menopause, and the confounding variables are age, genetic, caffeine and salt intake. The writer analizes variables using univariate analysis and bivariate analysis using chi-square while multivariate analysis using multiple logistic regression tests. **Results:** The relationship of menopausal age with hypertension in older women has a p-value of 0.499 with an OR value of 1.597 (CI: 0.412-6189) controlled by high salt intake variable. Elderly with age experiencing menopause older than average (50 years) will have the risk of developing hypertension 1.597 times greater than the elderly who experience younger menopause after being controlled by high salt intake variable. **Conclusion:** Elderly with age experiencing menopause older than average (50 years) will have a risk of developing hypertension 1.597 times greater than the elderly who experience younger menopause after being controlled by high salt intake variable. For researchers who would like to conduct further research, it is recommended to investigate the most dominant or most influential factors which influence the occurrence of hypertension in elderly women.

**Keywords:** age of menopause, hypertension, high salt intake

Corresponding Author:
Iin Ira Kartika
iinirakartika@yahoo.com

Received: 22 September 2019
Accepted: 4 October 2019
Published: 10 October 2019

Publishing services provided by Knowledge E



Selection and Peer-review under the responsibility of the ICHT 2019 Conference Committee.



## 1. Introduction

Post-menopausal women are more vulnerable to develop hypertension. The sex hormone, estrogen, is the culprit behind the blood vessels constriction that predisposes to

increased blood pressure and subsequent hypertension. The resultant of hypertension in the elderly is the development of further severe complications such as stroke, heart failure, and coronary heart disease. The current body of evidence in the literature hasreported that cardio- and cerebrovascular diseases remain the leading killers of people aged above 60 years old. (Kuswati, 2010).

By the year of 2017, the highest prevalence of hypertension in Indonesia was reported in the special region of Jakarta that reached a total of 11,820 cases with a total of 100 deaths, followed by West Java with a total of 8,220 cases and 95 deaths. In the East Java Province, 7,120 hypertension cases were reported of whom 90 patients died. Jakarta remains the leading province with the highest incidence rates of hypertension (incidence rate of 9.8 per 100,000 population), followed by North Sulawesi (50.7 per 100,000 population), Southeast Sulawesi (39.2 per 100,000 population), and Bali (35.8 per 100,000 population). (Department of Health, Republic of Indonesia, 2017).

The existence of *Pos PembindaanTerpadu* focusing on the management of non-communicable diseases once every month organized by *DesaSiagaAktif* in every village is considered adequate to monitor blood pressure fluctuation among this set of special population and will immediately refer the patients to the nearest primary health center once their blood pressure increases for further treatment. (Ministry of Health of Republic of Indonesia, 2012).

The hypothesis of this research is that there is a relationship between menopausae age and hypertension after being controlled by age, genetic of caffeine intake and salt intake. The preliminary study result conducted in Kedung Waringin Public Health Center are 108 menopause women and there are 78 menopause women suffering from hypertention. So, it is very important to focus on menopause age because they are so risky suffering from hypertension. This is the basis why it is important to do research on menopause age with hypertension

## 2. Objective

To investigate the association between the onset of menopause and hypertension among women in Kamurang and Rawakuda Villages, KedungWaringin Sub-District, Bekasi, in 2019.

## 3. Methods

### 3.1. Design and sample

This cross-sectional study collected the eligible subjects using total sampling methods which resulted in a total of 42 respondents.

### 3.2. Data collection procedure

How to collect data is using primary data. The writer gives it to menoupause women by giving questionnaires in Kamurang and Rawakuda village, Kedung Waringin district in 2019. The first procedure is by asking the willingness of the menopause women to become respondents and submitting a letter of visiting approval. After giving a brief explanation of how to fill out the questionnaire, respondents fill out the form accompanied by reseacher. Then the wariter collects the data and edits them. From result of editing data the writer performs and analizes it by using univariate and Bivariate analysis using chi-square while multivariate analysis using multiple logistic regression test.

### 3.3. Measurement

Measurements in this study include Menopause Age variables: 0 = Young: less than average (<50 years), 1 = Older than average (50 years). Hypertension variable; 0 = No hypertension, 1 = Hypertension; Age; 0 = Younger than average (<70), 1 = Older than average (70 years). Genetic; 0 = Not having hypertension history, 1 = Having history of hypertension. Caffeine intake: 0 = infrequent, 1 = Frequent high salt intake; 0 = A little, 1 = A lot

### 3.4. Data analysis

Data analysis using analysis descriptive (univariate analysis) is that to know the characteristics of respondents. Bivarite analysis aims to know two variables that are thought to be related or correlated. The statistical test used is Chi-Asquare at the 0.05 significance level ($p < 0.05$). Multifarite analysis using multiple logistic regression illustrates the true relationship between the selected independent variables and the dependent variables in the population. The estimation of independent variable effect on the best variable dependence is the estimation of the effect controlled by all confounders and also the effect modifier

## 4. Results

Univariate results describe the characteristics of menopausal women, age of menopause and the incidence of hypertension and other data according to the dependent and independent variables, as well as the confounding variables. This descriptive result provides a general description of the characteristics of the respondent. The following is the results of the descriptive analysis

TABLE 1: Demographic And Characteristics Of Older Women In Kamurang And Rawakuda Villages, Kedungwaringin Sub-District, In 2019.

| NO | CHARACTERISTICS | FREQUENCY | % |
|---|---|---|---|
| 1 | Onset of Menopause | | |
| | 1. Younger (< 50 years) | 26 | 61.9 |
| | 2. Older (≥ 50 years) | 16 | 38.1 |
| | TOTAL | 42 | 100 |
| 2 | Hypertension | | |
| | 1. No | 25 | 59.5 |
| | 2. Yes | 17 | 40.5 |
| | TOTAL | 42 | 100 |
| 3 | Current age | | |
| | 1. Younger (<average:70 years) | 22 | 52.4 |
| | 2. Older (≥ average: 70 years) | 20 | 47.6 |
| | TOTAL | 42 | 100 |
| 4 | Genetic Predisposition | | |
| | 1. No family history of hypertension | 19 | 45.2 |
| | 2. Had family history of hypertension | 23 | 54.8 |
| | TOTAL | 42 | 100 |

The result of this study show 26 (61.9%) respondents were younger (<50 years) at the onset of menopause, 25 (59.5%) respondents did not have hypertension, 22 (52.4%) respondents were in the younger age group (below 70 years of age: the mean age), 23 (54.8%) respondents came from a family with a history of hypertension, 35 (83.3%) respondents consume less amount of caffeine (coffee), and 25 (59.5%) respondents took a high amount of daily salt intake.

Menopausae age has a relationship with the occurrence of hypertension because along with age, naturally there is an increase in blood pressure. In addition, an increase in blood pressure can also occur during pregnancy. Especially for women, the hormone estrogen also has an important role in blood pressure, especially when a woman has come to menopause period. During this period, the number of estrogens will decrease and the risk of hypertension will increase. When a woman stops menstruating, the

hormone estrogen decreases significantly. This can damage endothelial cells which trigger plaque in blood vessels. This condition can trigger high blood pressure which causes cardiovascular disease

Table 2: Associated Beetween Onset Of Menopause Whit Hypertension Of Older Women In Kamurang And Rawakuda Villages, Kedungwaringin Sub-District, In 2019.

| No | Variables | OR | 90% CI | P-value |
|---|---|---|---|---|
| 1 | Onset of Menopause<br>1. Younger (< 50 years)<br>2. Older (≥ 50 years) | 1.244 | 0.351 – 4.409 | 0.735 |
| 2 | Current age<br>1. Younger (<average:70 years)<br>2. Older (≥ average: 70 years) | 0.963 | 0.280 – 3.308 | 0.963 |
| 3 | Genetic Predisposition<br>1. No family history of hypertension<br>2. Had family history of hypertension | 4.577 | 0.000 | 0.998 |
| 4 | Caffeine consumption<br>1. Occasional<br>2. Frequent | 0.533 | 0.091 – 3.135 | 0.487 |
| 5 | Salt intake<br>1. Low<br>2. High | 2.215 | 0.601 -8.173 | 0.232 |

The data presented in table 2 were the results of the binary logistic analysis. Theoretically, only those data with the p-value of less than 0.25 that could be included in the subsequent multivariate analysis; however, in our cases, we also included several variables which p-value was bigger than 0.25 since they were considered to possess substantial effect and became the independent variables. Therefore, the variables included in the double logistic regression were the onset of menopause (p-value: 0.998; >0.25) and **high daily salt intake (p-value: 0.232; <0.25).**

Table 3: Associated Beetween Onset Of Menopause Whit Hypertension Of Older Women In Kamurang And Rawakuda Villages, Kedungwaringin Sub-District, In 2019.

| No | Variables | OR | 90% CI | P-value |
|---|---|---|---|---|
| 1 | Onset of menopause | 1.597 | 0.412 - 6189 | 0.499 |
| 2 | High salt intake | 2.518 | 0.637 – 9.945 | 0.188 |

The association analysis between the onset of menopause and hypertension resulted in a p-value of 0.499 and OR 1.597 (CI: 0.412-6189) after adjustment for high salt intake. Older women whose onset of menopause was later than 50 years of age tend to be at 1.597 times risk for getting hypertension compared to those with the younger onset of menopause after adjustment for high salt intake.

## 5. Discussion

Older age does not possess direct association with hypertension but more likely to interact with other contributing factors such as emotional stress and sleeping difficulties. There is no significant association between age and both systolic and diastolic blood pressure found in the present study which might be attributed to the existence of other factors that have a direct influence on blood pressure among elderly, including dietary pattern. According to the results of a large study performed by Widyaningrum (2014), there is a significant correlation between sodium, potassium, and magnesium intake and alteration in blood pressure among elderly in Makamhaji Village. Excessive intake of sodium leads to increased sodium concentration in extracellular fluid.

Menopausal age has a relationship with the occurrence of hypertension because along with age, naturally there is an increase in blood pressure. In addition, an increase in blood pressure can also occur during pregnancy. Especially for women, said Arieska, the hormone estrogen also has an important role in blood pressure, especially when a woman enters menopause period. During this period, the number of estrogens will decrease and the risk of hypertension will increase. When a woman stops menstruation, the hormone estrogen decreases significantly. This can damage endothelial cells which trigger plaque in blood vessels. This condition can trigger high blood pressure which causes cardiovascular disease (Cardio Vascular Disease-CVD) and even stroke, " (Arieska, 2017)

Research on hypertension in menopausal women and its relationship to hormones in women also reveal the role and how hormones can affect blood pressure. Menopause is associated with a reduction in estradiol and a decrease in the ratio of estrogen to testosterone. This results in endothelial dysfunction and increases BMI which causes an increase in sympathetic nerve activation which often occurs in women who experience menopause. Activation of this sympathetic nerve will release the renin and angiotensin II stimulants. This endhotelial dysfunction ultimately increases salt sensitivity and increases in endhotelin. Increasing angiotensin and endhotelin can also cause oxidative stress which ultimately leads to hypertension.

Menopouse is a risk of developing cardiovascular disease. The small amount of estrogen in the body has a detrimental effect on the functioning of the cardiovascular and metabolism of the body so that menopause is a risk factor for the development of cardiovascular disease (Sharma, 2008). Izumi et al (2007), conducted a medical survey in northwest China, of 150 postmenopausal women, and a positive correlation was found between the postmenopausal period in both systolic blood pressure and diastolic blood

pressure. Blood pressure, at menopause age, and insignificant postmenopausal period were associated with body mass index, plasma rennin activity, glomerular filtration rate, or sodium and potassium excretion contents. Salt restriction can cause a balance of blood volume and lighten the work of the kidneys, so that renin secretion is minimal and accompanied by a decrease in blood pressure (Kaplan, 2002).

Another study (Kim, Kim, Lee, Lee, and Wang, 2014) investigated the mechanism of renal-mediated regulations of blood pressure across gender and explored the effects of salt intake on blood pressure (salt sensitivity) among pre- and post-menopausal women. The results showed that the prevalence of salt sensitivity increases with age, and a low-salt diet has been proven to help to reduce both systolic and diastolic blood pressure. Sodium is primarily concentrated in extracellular fluid, including intravascular and interstitial fluid. Salt contains sodium required for performing all human body functions. The kidney will retain sodium content when the body is lacking sodium and otherwise will increase urinary sodium excretion when intravascular sodium content is beyond the required amount. If kidney function is compromised, the excess in sodium could not be removed from the body, and it would accumulate in the blood. The intravascular volume would subsequently increase that force the heart and vascular system to carry harder work to pump blood that leads to increased blood pressure. (Almatsier, 2009).

## 6. Conclusion

Older individuals whose the onset of menopause is beyond the average age (50 years) are at a risk of 1.597 times higher to develop hypertension compared with those who stopped menstrual cycles at a younger age after adjustment for high salt intake. We strongly recommend that further study should focus on addressing the most influential factors among the contributing factors that increase the risk of developing hypertension in older women.

## References

[1] Almatsier, S. (2004). Prinsip Dasar Ilmu Gizi. Gramedia Pustaka Utama. Jakarta

[2] Anies.(2018). Penyakit Degeneratif. Yogyakarta: Ar – Ruzz Media

[3] Aprilindo, Fitra. (2013). Hubungan durasi aktivitas fisik dan asupan natrium dengan tekanan darah pada wanita Menopause, Semarang: <http://eprint.undipac.id> (diakses tanggal 28 Desember 2018)

[4] Apryani. (2016). Perbedaan Efektivitas Jus dalam penanganan hipertensi pada lansia, Skripsi. Univ Palembang: <http://repository.ump.ac.id> (Diakses tanggal 29 Desember 2018)

[5] Andria, K.M. (2013). Hubungan Antara PerilakuOlahraga,Stres, Dan PolaMakan-dengan TingkatHipertensiPadaLanjutUsia di KelurahanPutihKecamatanSukolilo Kota Surabaya.JurnalPromkes, 1: 111–117.

[6] Ardiani, Hanifah. (2014). Faktor-Faktor Risiko Hipertensi Pada Wanita Menopause Di Kelurahan RejomulyoKota Madiun. Madiun: <http://eprint.undip.ac.id/43230/1/4836.pdf>(diakses tanggal 29 Desember 2018)

[7] Arlita. (2014). Hubungan Asupan Natrium, Kalium, magnesium dan Status Gizi dengan tekanan darah Pada Lansia Di Kelurahan Makamhaji Kecamatan Surakarta. Universitas Muhammadiyah Surakarta.

[8] Artyaningrum, B. (2015). Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi Tidak Terkendali Pada Penderita Yang Melakukan Pemeriksaan Rutin Di Puskesmas Kedungmundu Kota Semarang Tahun 2014. Skripsi, Universitas Negeri Semarang: <https://lib.unnes.ac.id/20420/1/6411410092-S.pdf> (Diakses tanggal 1 Februari 2019)

[9] Black, J. M & Hawks, J. H. (2005). Medical surgical nursing: clinical management for positive outcomes. 7thEdition. St. Louis Elsevier Saunders.

[10] Izumi, Y., Matsumoto, K., Ozawa, Y., Kasamaki,Y., Shinndo, A., Ohta, M., Jumabay, M., Nakayama,T., Yokoyama, E., Shimobukuro, H.,Kawamura, H., Cheng, Z., Ma, Y., Mahmut,M. (2007). Effect Of Age At Menopause On Blood Pressure In Postmenopausal Women.American Journal Hypertens, 20 (10): 45-50.

[11] Ingrouille K. (2013). Effect of caffeinated beverages upon breakfast meal consumption of University of Wisconsin-Stout undergraduate students. Diakses: 8Juli 2019. Http://www2.uwstout.edu/content/lib/thesis/2013/2013ingrouillek.pdf.

[12] Juriyanti. (2016). Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi Pada Kelompok Wanita Menopause. Semarang: http://lib.unnes.ac.id/28462/1/6411412069.pdf (diakses tanggal 28 Desember 2018)

[13] Kaplan, N.M. (2002). Kaplan's ClinicalHypertension. 8th Edition. Philadelpia:Lippincott, hlm. 67-110, 221-223.

[14] Kemenkes RI. (2013). Profil Kesehatan Indonesia 2012, Jakarta: Kemenkes RI <http://www.depkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/profil-keseha tan-indonesia-2012.pdf>

[15] Kim, J.-M., Kim, T.-H., Lee, H.-H., Lee, S. H., &Wang, T. (2014). Postmenopausal hypertension and sodium sensitivity. J Menopausal Med, 20(1): 1–6

[16] Kozier, B., Erb, G., Snyder, S., Berman A. (2009). Buku ajar praktik keperawatan klinis 5thEdition. Jakarta: EGC.

[17] Prawirohardjo, Sarwono. (2012). Ilmu Kebidanan. Jakarta: PT Bina Pustaka.

[18] Sunaryo, dkk. (2016). Asuhan Keperawatan Gerontik. Yogyakarta: CV Andi Offset

[19] Sharma, S. (2015). Hypertension with special reference to causes and diet.Indian Journal Of Applied Research, 5: 12.

[20] Umamah, lestari. (2011). Hubungan Pre-Menopause Dengan Kejadian Hiertensi Pada Wanita Di Rt 11 Rw 05 Kelurahan Banjarbendo Sidoarjo, Jakarta: Jurnal Ilmiah Kesehatan. <http://repository.unusa.ac.id/2274/1/HUBUNGAN%20PRE%20MENOPAUSE%20DENGAN%20KEJADIAN%20HIPERTENSI%20PADA%20WANITA%20DI%20RT%2011%20RW%2005%20KELURAHAN%20BANJARBENDO%20SIDOARJO.pdf> (Diakses tanggal 28 Desember 2018)

[21] Widyaningrum. (2014). Hubungan Asupan Na, Kalium, Mg dan Status Gizi dengan tekanan darah pada lansia di KelurahanMakam Haji KecamatanKartasura. 2014.