

# Impact of hormone replacement therapy for cardiovascular risk factors in postmenopausal women: literature review

Leila Varoneckaitė, Eligija Teleišytė, Diana Žaliaduonytė

<sup>1</sup> Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania.

<sup>2</sup> Department of Cardiology, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania.



## Introduction

Hormone replacement therapy (HRT) is mostly known for relieving vasomotor symptoms in postmenopausal women, however, more published findings show that it can be beneficial while controlling some cardiovascular risk factors like carotid intima media (CIM) thickness, coronary artery calcium (CAC), high blood pressure (BP), lipoprotein level changes. Postmenopausal women are at higher risk of cardiovascular disease than their younger counterparts, therefore, HRT might be used as cardiovascular protection.

## Aim

Asses impacts of hormone replacement therapy for cardiovascular risk factors in postmenopausal women.

## Methods

Electronic search was conducted in the PubMed database using a combination of the following keywords: “hormone replacement therapy“, “estrogen replacement therapy“, “cardiovascular diseases“, “menopause“ using PRISMA selection criteria. Inclusion criteria: studies published less than 10 years ago, written in English language. Only observational studies (cross-sectional, case-control and cohort) were assessed. 9 publications out of 531 met the selection criteria and were analysed.

## Conclusions

HRT seems to be increasing CIM thickness, although it proved to reduce CAC, which is the main pathognomonic of atherosclerosis. HRT impact on BP and lipoprotein levels seems to be debatable. Further investigation is needed.

## Results

Two studies analysed changes in CIM thickness, one measured pulsatility index (PI). CIM thickness increase was greater after treatment cessation comparing with HRT period (mean [95% CI] difference, 0.006 [0.002-0.009] mm/y;  $p=0.002$ ) [1]. Although, recent results from the Kronos Early Estrogen Prevention study in early postmenopausal women did not find a difference in CIM thickness on HRT compared to placebo [2]. PI reduction SS ( $p=0,003$ ) after 16 weeks using HRT [3]. In one study SS 41% reduction of CAC, which is characteristic of atherosclerosis, score was observed in HRT users compared with non-users, independent of physical activity (PA) [4]. In two studies HRT was associated with higher odds of having high BP. One of them found that women with normal baseline BP were 32% more likely to have a new diagnosis of hypertension or start using antihypertensive drugs who used HRT compared to placebo [5]. Other associated increased odds for having high BP for women who used HRT for a longer period of time. However, this relationship decreases with age [6]. Third study results differed and the odds of being on antihypertensive drugs were 2.289 times greater for women not using HRT compared to HRT users [7]. Lipoprotein levels were SS higher in the HRT users [2, 9]. Two studies showed that low density cholesterol values were sustained [8] at 4 years and decreased after treatment cessation [2], however, other study found that LDL levels were SS higher in HRT group [9]. High density cholesterol was observed after 4 years of treatment, but after 3 years after trial completion it returned to pretreatment level [2], while other studies did not show any changes.

## Contacts

Email [leila.varoneckaite@yahoo.com](mailto:leila.varoneckaite@yahoo.com)

Phone number +37063352337



## References:

1. El Khoudary SR, Venugopal V, Manson JE, Brooks MM, Santoro N, Black DM, Harman M, Nathan F, Hodge DR, Brunton EA, Miller VM, Taylor HS, Bradoff MJ. Heart fat and carotid artery atherosclerosis progression in recently menopausal women: impact of menopausal hormone therapy. *The KBEP and Menopause*. 2020 Mar;23(2):255-262. doi: 10.1097/GME.0000000000000422. PMID: 32012601. PMCID: PMC7113829.
2. Miller VM, Hods HN, Lahr RD, Bailey KR, Jayachandran M. Changes in carotid artery intima-media thickness 3 years after cessation of menopausal hormone therapy: follow-up from the Kronos Early Estrogen Prevention Study. *Menopause*. 2019 Jun;26(1):24-31. doi: 10.1097/GME.0000000000001407. PMID: 30920254. PMCID: PMC6314504.
3. Woodard MK, Yoon E, Ockene JK, Brachman P, Ferrello AP, Scheraga H, Capp E, de Freitas PM. Effect of conjugated oestrogen versus conjugated oestrogen associated with medroxyprogesterone acetate in postmenopausal women on internal carotid artery pulsatility index: a randomized pilot study. *J Obstet Gynaecol Res*. 2011 Jul;37(7):815-8. doi: 10.1111/j.1447-0756.2010.01441.x. Epub 2011 Mar 16. PMID: 21410828.
4. Nishimura K, Young A, Hunter CJ, Agarwal N, Mao S, Bradoff MJ. Physical activity, hormone replacement therapy, and the presence of coronary calcium in middle women. *Women Health*. 2012;52(5):423-36. doi: 10.1080/03630242.2012.682705. PMID: 22747181. PMCID: PMC3261478.
5. Warren MP, Richardson O, Chahal S, She AD, Swice V, Sim V, Sloan NJ. Quality of life and hypertension after hormone therapy withdrawal in New York City. *Menopause*. 2013 Dec;20(12):1255-63. doi: 10.1097/GME.0b013e318264d878. PMID: 23371529.
6. Sakic V, Warren MP, Mason JE, Anand AK, Bhasin SK, Shetty B, Kozmar A, Berman J, Sridharan M, Womack CB. Effects of oral conjugated oestrogen with or without medroxyprogesterone acetate on incident hypertension in the Women's Health Initiative hormone therapy trials. *Menopause*. 2019 Jul;26(7):753-761. doi: 10.1097/GME.0000000000001067. PMID: 29381666. PMCID: PMC6314800.
7. Chin CL, Liu S, Thomson C, O'Connell A, Maitra A, Hennessy A, Lind JM. Menopausal hormone therapy is associated with having high blood pressure in postmenopausal women: observational cohort study. *PLoS One*. 2012;7(7):e40260. doi: 10.1371/journal.pone.0040260. Epub 2012 Jul 11. PMID: 22681229. PMCID: PMC3194783.
8. Casanova G, Spritzer PM. Effects of micronized progesterone added to non-oral estradiol on lipids and cardiovascular risk factors in early postmenopausal: a clinical trial. *Lipids Health Dis*. 2012 Oct 9;11:133. doi: 10.1186/1476-2875-11-133. PMID: 23040799. PMCID: PMC3509111.
9. Bangdiwala S, Ginnico Z, Yilmaz M, Biri A, Teis B, & Glaser H. (2009). Effects of hormone replacement therapy on glucose and lipid profiles and on cardiovascular risk parameters in postmenopausal women. *Archives of Gerontology and Geriatrics*, 23(5), 357-364. doi:10.1016/j.archger.2009.11.004.