

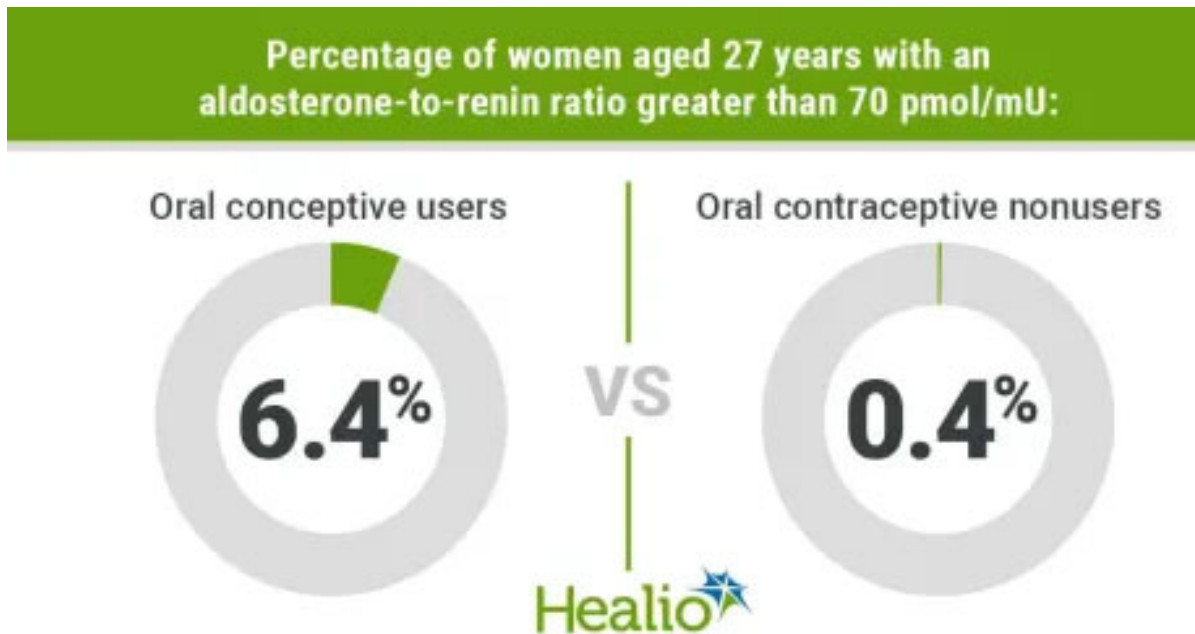
Oral contraceptive use may cause false-positive test for primary aldosteronism

Women who use [oral contraceptives](#) are more likely to have an aldosterone-to-renin ratio above the threshold for a positive test for primary aldosteronism than those who do not use oral contraceptives, according to study data.



Jun Yang

“The oral contraceptive pill can cause a false-positive test when screening for [primary aldosteronism](#),” Jun Yang, MBBS, PhD, FRACP, associate professor and head of the endocrine hypertension group at the Hudson Institute of Medical Research in Australia, told Healio. “Primary aldosteronism is the most common endocrine cause of hypertension and can be treated with targeted medications or potentially cured with surgery. In particular, the pill tends to lower renin concentration, which increases the aldosterone-to-renin ratio.”



Data were derived from Yang J, et al. *J Clin Endocrinol Metab.* 2023;doi:10.1210/clinem/dgad010.

Yang and colleagues conducted a retrospective cohort study of female offspring from women who participated in the Raine Study from 1989 to 1991 in Perth, Australia. In the study, offspring had their growth, metabolic and cardiovascular health assessed every 2 to 3 years until age 27 years. Women who had blood samples available and self-reported oral contraceptive use at age 17 years or age 27 years were included in the study. The threshold for a positive screening test for primary aldosteronism was an aldosterone-to-renin ratio greater than 70 pmol/mU. Researchers compared data between oral contraceptive users and women who did not use oral contraceptives.

The findings were published in *The Journal of Clinical Endocrinology & Metabolism*.

High ratio linked to oral contraceptives

The study included 484 girls aged 17 years, of whom 151 used an oral contraceptive and 333 were nonusers, and 486 women aged 27 years, of whom 235 used an oral contraceptive and 251 did not. Aldosterone levels were higher among oral contraceptive users at age 17 years than nonusers (486 pmol/L vs. 347 pmol/L; $P < .001$), but levels did not differ by oral contraceptive use at age 27 years. Women using oral contraceptives had higher renin levels than nonusers at age 17 years (20.6 mU/L vs. 13.4 mU/L; $P < .001$) and age 27 years (11.8 mU/L vs. 9.2 mU/L; $P < .001$).

At age 17 years, 12.6% of oral contraceptive users had an aldosterone-to-renin ratio of 70 pmol/mU or higher compared with 2.1% of nonusers ($P < .001$). At age 27 years, 6.4% of women using oral contraceptives had a high aldosterone-to-renin ratio compared with 0.4% of nonusers ($P < .001$). Systolic blood pressure, diastolic BP, and serum and urinary potassium were similar between oral contraceptive users with an aldosterone-to-renin ratio less than 70 pmol/mU and those with a ratio higher than 70 pmol/mU at both age points.

“Women with hypertension who take the oral contraceptive pill should either have the aldosterone-to-renin ratio test result carefully interpreted or stop the pill before being tested for primary aldosteronism,” Yang said. “If the aldosterone-to-renin ratio is normal while the patient is on the pill, then it is likely to be a true normal result. If the aldosterone-to-renin ratio is abnormal while the patient is on the pill, then it should be retested after stopping the pill for 2 to 4 weeks whilst using alternative contraception. In fact, the oral contraceptive pill itself can cause increased BP, hence it is reasonable to stop the pill during the initial investigation of hypertension.”

When oral contraceptive users and nonusers aged 17 years were combined, there was a weak relationship between aldosterone-to-renin ratio and systolic BP (beta = 0.038; $P = .047$) and diastolic BP (beta = 0.03; $P = .038$). There was no relationship observed when participants were divided by oral contraceptive use. No associations between aldosterone-to-renin ratio and systolic or diastolic BP were observed among women aged 27 years, though a weak association was observed between aldosterone and systolic BP for oral contraceptive users who did not use alcohol (beta = 0.021; $P < .05$).

Longer term follow-up needed

Yang said the study’s biggest limitation was how women with an abnormal screening test could not undergo further primary aldosteronism testing and that very few women had high BP.

“Without formal diagnostic testing, we can only postulate that the elevated aldosterone-to-renin ratio in the setting of oral contraceptive pill use represents a false-positive result,” Yang said. “Longer-term follow-up of the cohort, with repeat measurements of their aldosterone, renin and the aldosterone-to-renin ratio followed by pill cessation and prospective testing for primary aldosteronism, will help us better understand the nature of their hypertension. This may be possible through ongoing collaboration with the Raine Study, one of the largest, most successful pregnancy cohort studies in the world.”

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For more information:

Jun Yang, MBBS, PhD, FRACP, can be reached at jun.yang@hudson.org.au.

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‘Widespread missed opportunities’ for primary aldosteronism testing among veterans

Testing for primary aldosteronism was rare among a cohort of U.S. veterans with treatment-resistant hypertension, but it was associated with higher rates of evidence-based treatment and better longitudinal blood pressure control, data show.



“Although guidelines recommend testing for primary aldosteronism in all patients with treatment-resistant hypertension, we found very low rates of screening for primary aldosteronism — on average 2% across centers — and only 13% of patients were started on mineralocorticoid receptor antagonists when most of them should have been.” **Jordana B. Cohen, MD, MScE**, assistant professor of medicine and epidemiology

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