

Progestin-Only Birth Control Linked to Lower Likelihood of New Migraine Diagnoses

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Key Findings:

- Women who were prescribed progestin-only birth control were less likely to be diagnosed with migraines compared to those not using hormonal contraception.
- The likelihood of reduction in migraine diagnosis varied by contraceptive method: 24% lower for intrauterine implant, 18% lower for oral medication, and 15% lower for intramuscular injection.

Migraines affect many women of reproductive age, and hormone changes are known triggers. While clinical guidance often considers migraine history when prescribing estrogen-containing birth control,¹ much less is known about how hormonal contraception might influence the initial onset of migraines. Understanding whether progestin-only birth control affects the likelihood of newly being diagnosed with migraines provides important context for contraceptive counseling.

We studied more than 2 million patients aged 15 to 49. We matched patients newly diagnosed with migraines between January 1, 2018, and December 31, 2023, with patients who had an office visit in the same month and who were of similar age, race, ethnicity, and hypertension status. We also accounted for social vulnerability and rurality based on residence, BMI classification, smoking history, prior pregnancy, and census region in our analysis. We ended the study period at the end of 2023 because oral contraceptives became available over the counter in 2024,² reducing our ability to reliably identify users.

We found that patients who used intrauterine progestin-only birth control were 24% less likely to have migraines diagnosed within two years compared to patients without a history of birth control use, as seen in Figure 1. Similarly, patients who were on oral progestin-only birth control were 18% less likely to be diagnosed with migraines within two years, those who were on intramuscular progestin-only birth control were 15% less likely, and those on other routes were 13% less likely.

Migraine Likelihood on Progestin-Only Birth Control

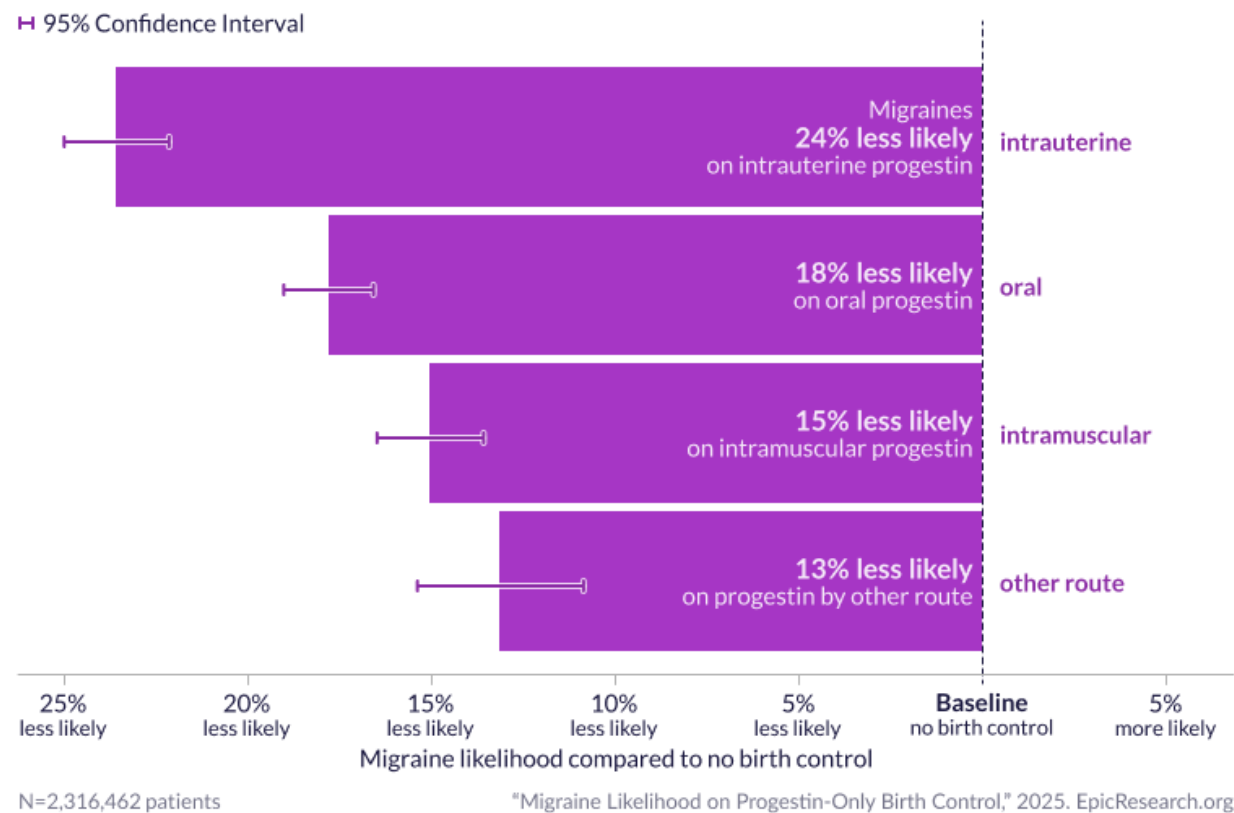


Figure 1. The likelihood of a novel migraine diagnosis in women prescribed progestin-only birth control by route.

Because this study included only individuals without prior migraines, the findings reflect association with new diagnoses rather than migraine progression.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 300 million patient records from 1,800 hospitals and more than 41,000 clinics from all 50 U.S. states, Canada, Lebanon, and Saudi Arabia. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. MacGregor EA. Migraine and use of combined hormonal contraceptives: a clinical review. J Fam Plann Reprod Health Care. 2007;33(3):159-169. doi:10.1783/147118907781004750
2. FDA approves first nonprescription daily oral contraceptive. U.S. Food and Drug Administration. August 9, 2024. <https://www.fda.gov/news-events/press-announcements/fda-approves-first-nonprescription-daily-oral-contraceptive>. Accessed December 11, 2025.

Data Definitions

Term	Definition
Study period	Index: 1/1/2018 to 12/31/2023 Lookback: Back to 1/1/2016

Study population: inclusion	Patients: • Living in the U.S. • Who have an evaluated sex of female • Who have more than one outpatient face-to-face visit more than two years prior to their index event • Who are aged 15 to 49 as of the index event
Study population: exclusion	Patients with documented instance of migraines before index event
Index event	Case patients: Date of first migraine diagnosis Control patients: Outpatient face-to-face visit during the same month as their matched case patient's migraine diagnosis
Exposures	Route of progestin-only birth control within two years prior to the migraine diagnosis • Oral • Intrauterine • Intramuscular (injection) • Other (including implant and transdermal)
Outcomes	Migraines: A billing, encounter, or problem list diagnosis with ICD-10-CM code G43*
Confounders	Race and ethnicity Social Vulnerability Index quintile RUCA Census region Prior pregnancy: Y/N History of hypertension: a billing, encounter, or problem list diagnosis with ICD-10-CM code I10-I16* or I1A* Age at index buckets: • 15-19 • 20-24 • 25-29 • 30-34 • 35-39 • 40-44 • 45-49 BMI classification (earliest within 3 months either side of index date) • Underweight: <18.5 • Healthy: 18.5-<25 • Overweight: 25-<30 • Obese: 30+ • Severely obese: 40+ Has ever smoked • Cigarette Pack Years) > 0 • Cigarette Packs/Day > 0 • Smoking Status: "Current Every Day Smoker"; "Current Some Day Smoker"; "Every Day"; "Former"; "Former Smoker"; "Heavy Smoker"; "Heavy Tobacco Smoker"; "Light Smoker"; "Light Tobacco Smoker"; "Smoker, Current Status Unknown"; or "Some Days"
Outpatient face-to-face visit	An encounter of type Emergency, Office Visit, Well Child, Follow-Up, Telemedicine, Urgent Care, Walk-In, Routine Prenatal, Postpartum Visit,

	Fetal Care Consult or derived encounter type of Hospital Outpatient Visit or Emergency.
Matched Patient	1:2 matched case to control on hypertension (prior to index event), age at index event, race and ethnicity , and month of outpatient face-to-face visit or migraine diagnosis
Progestin-only birth control	A medication with an order type of administered, historical, or prescription and a simple generic name of “desogestrel,” “drospirenone,” “etonogestrel,” “levonorgestrel,” “medroxyprogesterone acetate,” “norethindrone,” “norgestrel,” or “progesterone”
Race and ethnicity	Patients were classified by self-reported race and ethnicity that were mapped to standards as Hispanic (Ethnicity reported as Hispanic or Latino, any race documented), multiracial (patients with more than one recorded race, any ethnicity), White (White race, any ethnicity), Black (Black race, any ethnicity), Asian (Asian Race, any ethnicity), other (any other race not categorized above), or unknown (undocumented)
Model specifications	Case/Control Logistic regression
Limitations	Medication adherence was not measured Duration and dosage of exposure were not accounted for

Table 1. Migraine Likelihood on Progestin-Only Birth Control

Term	Control	Odds Ratio	Lower CI	Upper CI
Route: Intramuscular	No birth control	0.85	0.84	0.86
Route: Intrauterine	No birth control	0.76	0.75	0.78
Route: Oral	No birth control	0.82	0.81	0.83
Route: Other	No birth control	0.87	0.85	0.89
SVI Q2	SVI Q1	1.05	1.04	1.07
SVI Q3	SVI Q1	1.07	1.06	1.08
SVI Q4	SVI Q1	1.10	1.09	1.11
SVI Q5	SVI Q1	1.00	0.99	1.01
SVI Other	SVI Q1	0.97	0.89	1.05
Census Region Northeast	Census Region Midwest	1.30	1.29	1.32
Census Region South	Census Region Midwest	1.34	1.33	1.35
Census Region West	Census Region Midwest	1.25	1.23	1.26
Had Prior Pregnancy	No Prior Pregnancy	0.68	0.67	0.68
BMI Band [25-30)	BMI Band [18.5-25)	1.05	1.04	1.06
BMI Band [30-40)	BMI Band [18.5-25)	1.10	1.09	1.11
BMI Band <18.5	BMI Band [18.5-25)	0.91	0.89	0.94
BMI Band 40+	BMI Band [18.5-25)	1.05	1.04	1.06
BMI Band Unknown	BMI Band [18.5-25)	1.22	1.21	1.23
Smoker	Non-Smoker	0.90	0.89	0.91
RUCA Bucket Micropolitan	RUCA Bucket Metropolitan	1.25	1.23	1.26

RUCA Bucket Rural	RUCA Bucket Metropolitan	1.03	1.00	1.05
RUCA Bucket Small Town	RUCA Bucket Metropolitan	1.12	1.10	1.14
RUCA Bucket Unknown	RUCA Bucket Metropolitan	1.07	0.96	1.19