SSRI Antidepressants Associated with Lower Risk of Blood Cancers

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Key Findings

- Patients on selective serotonin reuptake inhibitor (SSRI) antidepressants for three to eight years showed an 18% lower risk of developing hematologic cancer compared to those not on an SSRI.
- Patients prescribed SSRIs did not have a significant change in the risk of overall cancer or cancer of the lungs, breast, colon, rectum, prostate, pancreas, or skin.

Selective serotonin reuptake inhibitors (SSRIs) are widely prescribed for depression and anxiety disorders. Previous studies suggest SSRIs may enhance T-cell activity, potentially improving immune surveillance against cancers,[1] however, other studies have found mixed associations, including potential increased risk of some cancer types.[2,3]

To further explore the relationship between SSRI use and cancer diagnoses across various cancer types, we studied 627,964 adult patients, including patients with no history of SSRI use and those with three to eight years of SSRI use. Patients were matched 1:1 based on legal sex and age, and we accounted for other factors such as demographics, smoking history, BMI, use of other antidepressants, and comorbidities in our analysis.

We found that SSRI use did not significantly change the overall risk of developing cancer, as seen in Figure 1. Similarly, no significant associations were observed for lung, breast, colorectal, prostate, pancreatic, or melanoma cancers. However, patients on SSRIs had an 18% lower risk of hematologic cancers compared to those not on an SSRI. This aligns with prior animal studies suggesting SSRIs may enhance immune surveillance by modulating T-cell activity.[1]

Cancer Risk by SSRI Use

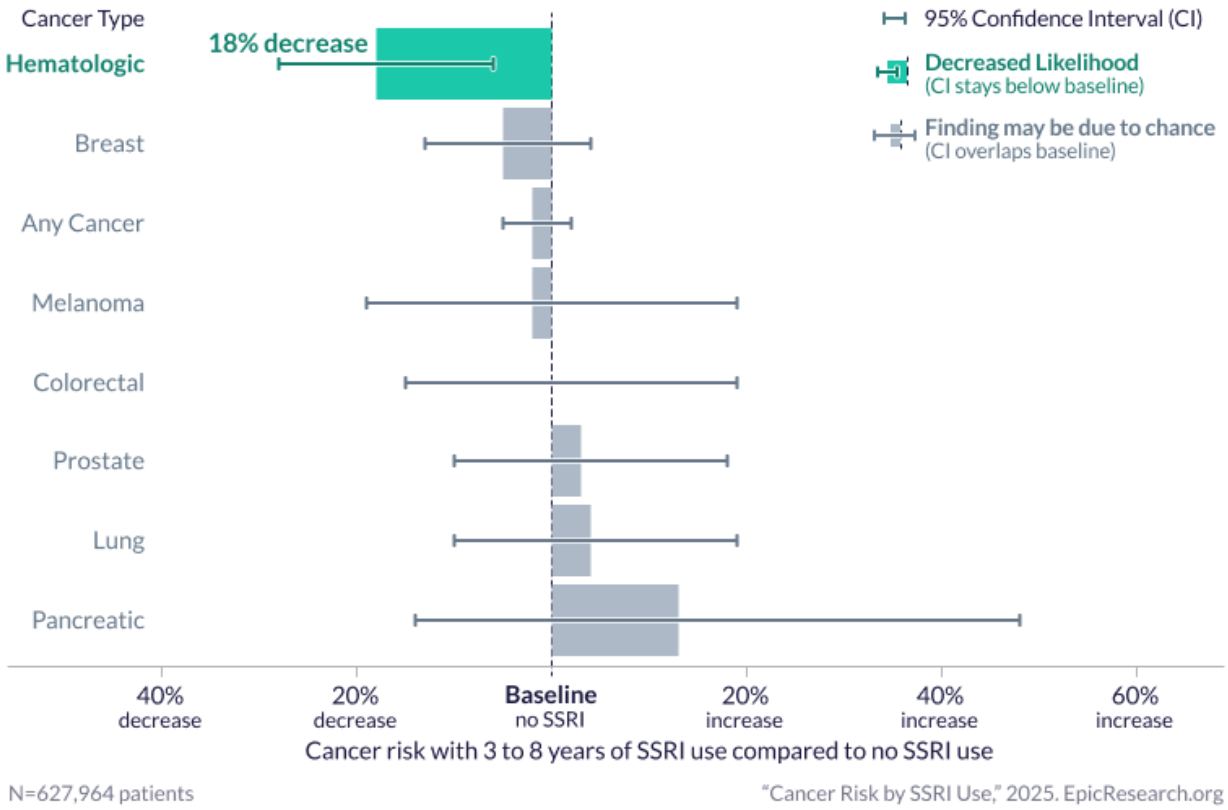

Figure 1. Cancer risk for patients with three to eight years of SSRI use compared to those with no SSRI use.

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 1,700 hospitals and more than 40,000 clinics from all 50 U.S. states, 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. Li B, Elsten-Brown J, Li M, et al. Serotonin transporter inhibits antitumor immunity through regulating the intratumoral serotonin axis. Cell. Published online 2025. doi:10.1016/j.cell.2025.04.032
2. Boursi B, Lurie I, Mamtani R, Haynes K, Yang YX. Anti-depressant therapy and cancer risk: a nested case-control study. Eur Neuropsychopharmacol. 2015;25(8):1147-1157. doi:10.1016/j.euroneuro.2015.04.010
3. Ashbury JE, Lévesque LE, Beck PA, Aronson KJ. A population-based case-control study of Selective Serotonin Reuptake Inhibitors (SSRIs) and breast cancer: the impact of duration of use, cumulative dose and latency. BMC Med. 2010;8:90. Published 2010 Dec 22. doi:10.1186/1741-7015-8-90

Data Definitions

Term	Definition
Study period	1/1/2017 to 6/1/2025
Study population: inclusion	Patients aged 18 or older as of their first observed **face-to-face visit** in the study period who have at least one **outpatient face-to-face visit** every 18 months during the study period
Study population: exclusion	Patients with: • A **secondary cancer** without evidence of a primary cancer or **secondary cancer** documented before a primary cancer • Evidence of SSRI use before 7/1/2017 (including patient reported/historical medications) • Patients with SSRI use for less than three years • History of any cancer (ICD-10-CM code C*) including on problem list • No census region
Censoring	First **cancer** diagnosis Last **outpatient face-to-face visit** Evidence of death
Index date	Case patients: three years after the first SSRI use Control patients: three years after first **outpatient face-to-face visit**
Exposures	**Continuous usage** of an **SSRI** for at least three years
Outcomes	Breast cancer: ICD-10-CM code C50* Colorectal cancer: ICD-10-CM code C18*, C19, C20 Lung cancer: ICD-10-CM code C34* Prostate cancer: ICD-10-CM code C61* Pancreatic cancer: ICD-10-CM code C25* Melanoma: ICD-10-CM code C43* Hematologic cancers: ICD-10-CM code C81*-C96* Any cancer: ICD-10-CM code C* (excluding **secondary cancers**)
Secondary cancer	ICD-10-CM: C7B*, C77*, C78*, C79*

Confounders	Age at index: 18-34, 35-49, 50-64, 65+
	Legal sex
	Race and ethnicity
	Social Vulnerability Index quintile
	Census region
	Has ever smoked
	BMI classification
	• Underweight: < 18.5
	• Healthy: 18.5 to < 25
	• Overweight: 25 to < 30
	• Obese: 30+
	• Severely Obese: 40+
	Evidence of first use of:
	• Other antidepressants: ATC code N06A* (excluding N06AB*)
	  ○ Before tracking period
	  ○ During tracking period
	• Anti-anxiety medications: ATC Code N05B*
	  ○ Before tracking period

	○ During tracking period History of: • **Depression** • **Anxiety** • **Bipolar disorder** • **Hypertension** • **CKD** • **Type 2 diabetes**
Outpatient face-to-face visit	Encounter with a type of Emergency, Office Visit, Well Child, Follow-up, Telemedicine, Urgent Care, Walk-In, Routine Prenatal, Postpartum Visit, or Fetal Care Consult
SSRI	A prescription with ATC code N06AB*
Continuous usage	Duration in days calculated by: (Quantity / Daily Frequency) * (Refills + 1) A maximum 90-day gap between a discontinued order and the start of a new order. A default duration of 365 days was used in the event that one of the variables needed for the duration formula was missing.
Depression	A diagnosis with ICD-10-CM code F32*, F33*, F06.31*, F06.32*, or F34.1*
Anxiety	A diagnosis with ICD-10-CM code F40*, F41*, F06.4*, F93.0*, or F94.0*
Bipolar disorder	ICD-10-CM: F31*
Hypertension	ICD-10-CM code I10
CKD	ICD-10-CM code N18*
Type 2 diabetes	ICD-10-CM code E11*
Race and ethnicity	Patients were classified by self-reported race and ethnicity as Non-Hispanic Black (Black), Hispanic (any race), non-Hispanic White (White), non-Hispanic Asian (Asian), non-Hispanic Other (Other), non-Hispanic multiracial (Multiracial) and Unknown if no race/ethnicity information was present.
Model specifications	Cox proportional hazards model, SSRI patients to non-SSRI patients matched 1:1 on sex and age bucket

Table 1: Cancer Risk by SSRI Use

Cancer Type	Hazard Ratio for SSRI Use	95% CI low	95% CI high
Pancreatic	1.13	0.86	1.48
Lung	1.04	0.90	1.19
Prostate	1.03	0.90	1.18
Colorectal	1.00	0.85	1.19
Melanoma	0.98	0.81	1.19
Any Cancer	0.98	0.95	1.02
Breast	0.95	0.87	1.04
Hematologic	0.82	0.72	0.94