Real-World Patient Characteristics and Outcomes Associated with Antibody-Drug Conjugate Therapy: A Large Cohort Study

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PurpleLab® HEALTHCARE ANALYTICS

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Introduction

Antibody-drug conjugates (ADCs) are an expanding class of targeted oncology therapies. However, large-scale, real-world data on their associated toxicities, healthcare utilization, and patient outcomes across diverse cancer types are limited. This study addresses this gap by analyzing a diverse patient population.

Objectives

To characterize patient demographics, cancer indications, treatment patterns, and survival outcomes in a large cohort of patients receiving ADC therapy.

Methods

A retrospective cohort study was conducted using PurpleLab® CLEAR claims data from January 1, 2019, to June 30, 2024. The study included patients with a confirmed cancer diagnosis who initiated a new ADC therapy between January 1, 2020, and June 30, 2023. Patients were required to have at least a 12-month of continuous health plan enrollment prior to initiation (index date).

Main Outcomes and Measures

The primary outcome was all-cause mortality during at least 12 months of follow-up post-index. Secondary outcomes included the time from cancer diagnosis to ADC initiation and the prevalence of secondary cancers. We used Kaplan-Meier methods to estimate survival, and Cox proportional hazards models to assess mortality risk, adjusted for patient demographics, cancer type, and ADC agent.

Results

The cohort of 32,486 patients was predominantly Non-Hispanic (86.5%), white (86.4%), and female (73.3%) (Figure 1). The most common indications were breast cancer (58.4%), urothelial carcinoma (12.5%), and Hodgkin's lymphoma (10.9%). Ado-trastuzumab emtansine (29.0%), fam-trastuzumab deruxtecan-nxki (20.5%), and brentuximab vedotin (13.8%) were the most frequently administered ADCs. The mean time from diagnosis to ADC initiation was 349 days; 63.1% had secondary cancer at initiation, and 56.5% died during follow-up (Table 1).

Survival probabilities differed significantly across ADCs (log rank p<0.0001 (Figure 2). After multivariable adjustment, the mortality risk varied by both ADC agent and cancer type. Treatment with sacituzumab govitecan-hziy, enfortumab vedotin-ejfv, or a diagnosis of acute myeloid leukemia was linked to higher mortality rates, whereas breast cancer patients were linked to the lowest rates. Older age and public insurance were associated with increased mortality, while higher education and income levels were associated with improved survival (Figure 3).

Table 1. Cancer indications and ADC utilization.

Characteristic	No. (%)
Remission, n (%)	23,326 (71.8%)
Other primary cancer n(%)	15,805 (48.7%)
Secondary cancer, n (%)	20,500 (63.1%)
Index year, n (%)	
2020	8,168 (25.2%)
2021	7,063 (21.8%)
2022	10,064 (31.0%)
2023	7,173 (22.1%)
Days from dx to index, Median (IQR)	349.0 (246.0 - 362.0)
Cancer type, n (%)	
Acute Lymphoblastic Leukemia	343 (1.1%)
Acute Myeloid Leukemia	307 (0.9%)
Anaplastic Large Cell Lymphoma	547 (1.7%)
Breast Cancer	18,967 (58.4%)
Cervical Cancer	234 (0.7%)
Diffuse Large B-cell Lymphoma	3,245 (10.0%)
Gastric Cancer	695 (2.1%)
Hodgkin Lymphoma	3,544 (10.9%)
Multiple Myeloma	61 (0.2%)
Ovarian/Fallopian/Peritoneal Cancer	479 (1.5%)
Urothelial Cancer	4,046 (12.5%)
ADC molecule, n (n%)	
ado-trastuzumab emtansine	9,402 (29.0%)
brentuximab vedotin	4,470 (13.8%)
enfortumab vedotin-ejfv	3,865 (11.9%)
fam-trastuzumab deruxtecan-nxki	6,665 (20.5%)
gemtuzumab ozogamicin	316 (1.0%)
inotuzumab ozogamicin	330 (1.0%)
loncastuximab tesirine-lpyl	203 (0.6%)
mirvetuximab soravtansine-gynx	397 (1.2%)
polatuzumab vedotin-piiq	2,824 (8.7%)
sacituzumab govitecan-hziy	3,774 (11.6%)
tisotumab vedotin-tftv	222 (0.7%)

Figure 1. Patient demographics and social drivers of health.

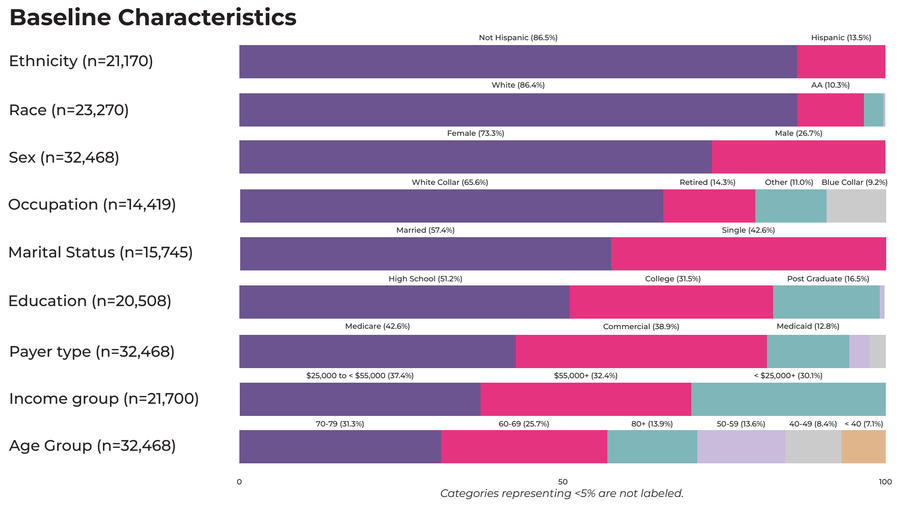


Figure 2. Kaplan–Meier survival curves by ADC molecule.

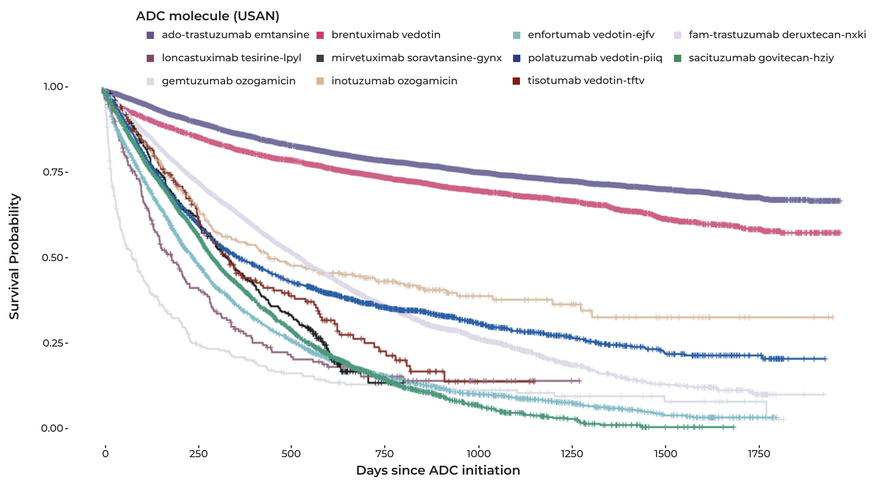
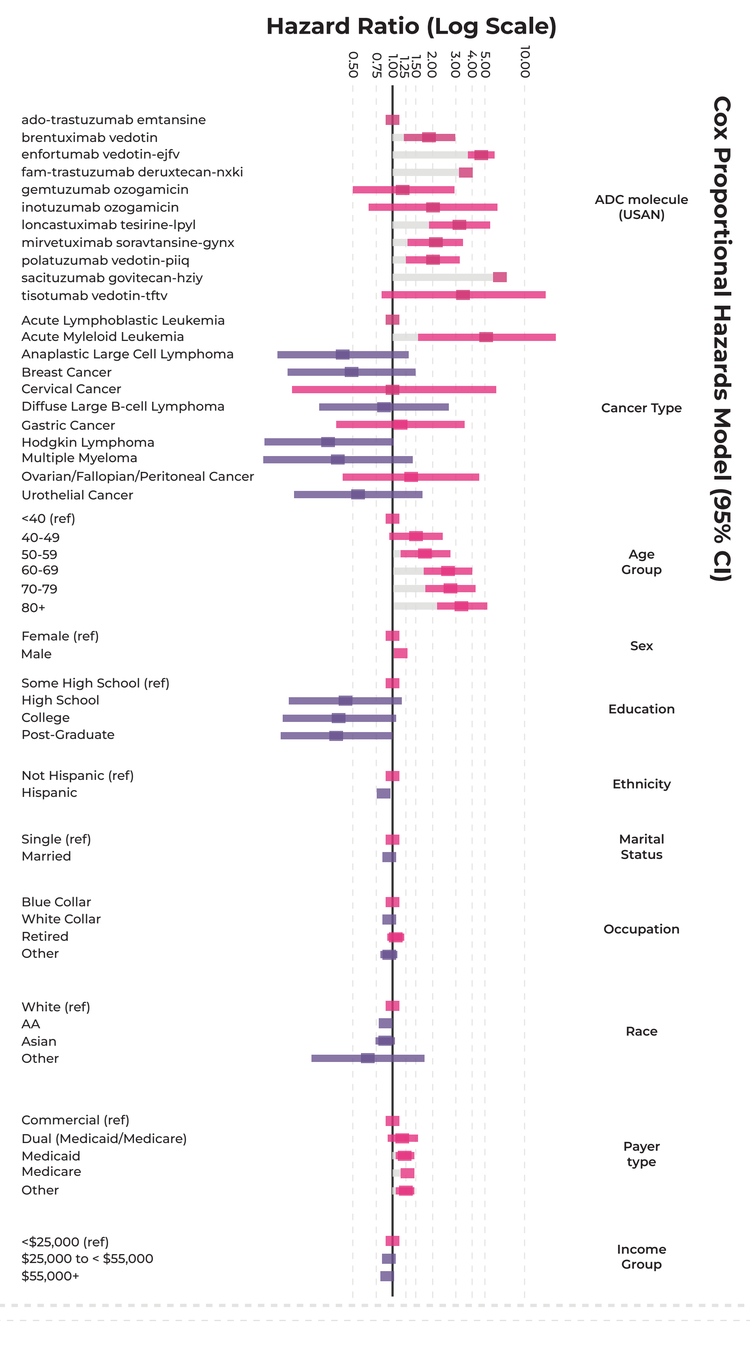


Figure 3. Miami plot of mortality by social drivers of health, payer type, cancer type, and ADC agent.



Conclusion

In this large real-world analysis, survival outcomes for patients treated with ADCs varied significantly according to the specific agent, cancer indication, and sociodemographic factors, including payer type.

These findings underscore the importance of patient selection and highlight existing variation in outcomes. Further research is needed to optimize the timing and application of ADC therapy in clinical practice.

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