

PREVALENCE OF STANDARD MODIFIABLE RISK FACTORS AND ASSOCIATED CARDIOVASCULAR EVENTS AMONG PATIENTS HOSPITALIZED WITH ACUTE MYELOID LEUKEMIA: A NATIONWIDE INPATIENT ANALYSIS (2016–2022)



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INTRODUCTION

Patients with Acute Myeloid Leukemia (AML) face substantial cardiovascular morbidity, yet the burden of standard modifiable cardiovascular risk factors (SMuRFs)—hypertension, diabetes, hyperlipidemia, and smoking—remains poorly characterized. We evaluated SMuRF prevalence in AML hospitalizations and their association with cardiovascular disease and acute myocardial infarction (AMI).

METHOD

- Study Design:** Retrospective cohort study using the **National Inpatient Sample (NIS), 2016–2022.**
- Study Population:** Adult hospitalizations (**≥18 years**) with **acute myeloid leukemia (AML)** identified using ICD-10 codes.
- Exclusion Criteria:** Hospitalizations associated with **COVID-19** were excluded.
- SMuRF Definition:** Presence of **≥1 standard modifiable cardiovascular risk factor**:
 - Hypertension
 - Diabetes mellitus
 - Hyperlipidemia
 - Smoking
- Outcomes Assessed:** Association of SMuRF status with **prior cardiovascular disease** and **in-hospital acute myocardial infarction (AMI).**
- Statistical Analysis:** **Survey-weighted multivariable logistic regression** was used to identify demographic and socioeconomic predictors of SMuRFs and evaluate cardiovascular associations.

CONCLUSIONS

- SMuRFs were highly prevalent**, affecting nearly **75% of AML hospitalizations.**
- SMuRFs were strongly associated with **pre-existing cardiovascular disease** and **increased odds of in-hospital AMI.**
- Significant **racial and socioeconomic disparities** in SMuRF burden highlight the need for **early cardiovascular risk assessment and multidisciplinary cardio-oncology care**, particularly in high-risk and underserved AML populations.

RESULTS

RESULTS 1

(Part 1: Prevalence and Age Difference)

Prevalence of Standard Modifiable Risk Factors (SMuRFs) in AML Hospitalizations

Among **462,000** AML hospitalizations **74.9%** had ≥1 Standard Modifiable Cardiovascular Risk Factor (SMuRF).

PREVALENCE OF SMuRFs

74.9%
≥1 SMuRF

With ≥1 SMuRF (74.9%)

No SMuRF (25.1%)

AGE DIFFERENCE

Patients with SMuRFs were significantly older than those without SMuRFs.

64.9 vs 52.2
years

p < 0.001

AML = Acute Myeloid Leukemia; SMuRF = Standard Modifiable Cardiovascular Risk Factor.

RESULTS 1 (PART 2)

Independent Predictors of Having ≥1 SMuRF (Adjusted Odds Ratios)

Age
(per year increase)

aOR 1.05
p < 0.001

Male Sex
(vs. Female)

aOR 1.40
p < 0.001

Black Race
(vs. White)

aOR 1.42
p < 0.001

HOUSEHOLD INCOME (vs. Lowest Quartile)

Lower Income
Higher Odds

Higher Income
Lower Odds

Lowest Quartile
(Reference)

26th – 50th
Percentile

51st – 75th
Percentile

Highest Quartile

—

aOR 0.91
p < 0.001

aOR 0.81
p < 0.001

aOR 0.67
p < 0.001

FACTORS ASSOCIATED WITH LOWER ODDS OF HAVING ≥1 SMuRF (Adjusted Odds Ratios)

Hispanic Ethnicity
(vs. White)

aOR 0.77
p < 0.001

Asian/Pacific Islander Race
(vs. White)

aOR 0.85
p < 0.001

Private Insurance
(vs. Medicare)

aOR 0.79
p < 0.001

SMuRF = Standard Modifiable Cardiovascular Risk Factor

RESULTS 2

Association of SMuRFs with Prior Cardiovascular Disease and In-Hospital Acute Myocardial Infarction

A. ASSOCIATION WITH PRIOR CARDIOVASCULAR DISEASE (Adjusted Odds Ratios)

Prior Myocardial Infarction (MI)

aOR 3.81
(95% CI 3.61 – 4.03)
p < 0.001

Prior Pulmonary Embolism (PE)

aOR 1.44
(95% CI 1.38 – 1.50)
p < 0.001

Prior Percutaneous Coronary Intervention (PCI)

aOR 4.86
(95% CI 4.53 – 5.21)
p < 0.001

Prior Coronary Artery Bypass Grafting (CABG)

aOR 4.11
(95% CI 3.73 – 4.54)
p < 0.001

B. ASSOCIATION WITH IN-HOSPITAL ACUTE MYOCARDIAL INFARCTION (AMI)

During hospitalization, patients with ≥1 SMuRF had higher odds of AMI.

aOR 1.16
(95% CI 1.04 – 1.29)
p = 0.01

KEY TAKEAWAY

SMuRFs are strongly associated with adverse cardiovascular history and increased odds of in-hospital AMI in AML hospitalizations.

SMuRF = Standard Modifiable Cardiovascular Risk Factor; aOR = adjusted Odds Ratio; CI = Confidence Interval; AML = Acute Myeloid Leukemia

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