171 Cardiovascular Risks Associated With Cannabis Use in Emergency Department Patients

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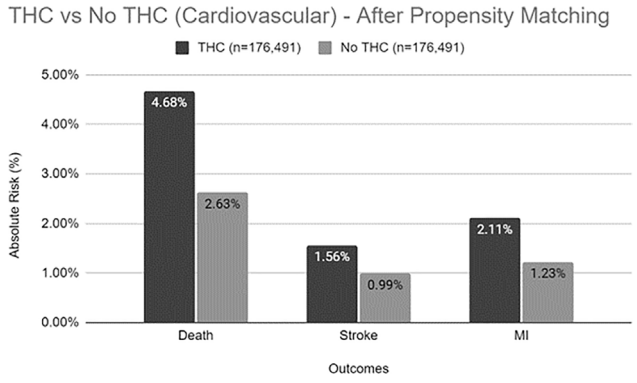
Background: Cannabis is one of the most commonly used psychoactive substances worldwide, with 14.4% of young adults in the US meeting the criteria for cannabis use disorder (CUD). This disorder is characterized by a loss of control over cannabis use despite adverse consequences. While cannabis is associated with various psychiatric syndromes, research on its potential to cause adverse cardiovascular events (CVD) has yielded mixed results. This study aims to investigate the relationship between cardiovascular outcomes and cannabis use in emergency department (ED) patients.

Methods: This was a retrospective, propensity matched study utilizing the TriNetX database to analyze records of patients from 61 healthcare organizations in the United States between the time period of Feb 2004 - Feb 2021. Cohorts consisted of adult patients and grouped based on diagnosis of "Cannabis Use, Uncomplicated" (CUD) within 5 years before or 1 month after an ED visit. A control group which included a history of pharyngitis, but no CUD diagnosis was created for propensity matching (control group with no CUD was too large for propensity matching). A sub-group analysis compared CUD patients with those diagnosed with "Alcohol Related Disorders" (ARD) and no CUD history. The outcomes evaluated were all-cause mortality, stroke, and myocardial infarction (MI) within 3 years after the ED visit. Patients who previously experienced these outcomes were excluded from the study. Propensity matching was performed for demographics and pre-existing medical conditions for the primary analysis and secondary analysis.

Results: There were 1,271,151 patients identified with ED visits with or without CUDs. After propensity matching, there were a total of 352,982 adult patients with CUD (n=176,491) within 5-years prior or 1-month after an ED visit or no history of CUD (n=176,491). Patients with CUD had a higher rate of mortality (4.68% vs 2.63%, RR 1.78, 95% CI 1.72-1.89, p<0.001), stroke (1.56% vs 0.99%, RR 1.58, 95% CI 1.49-1.68, p<0.001), and MI (2.11% vs 1.23%, RR 1.71, 95% CI 1.62-1.80, p<0.001) within 3-years of the ED visit compared to patients with no CU. For the secondary analysis, patients with CUD had lower rates of mortality (3.96% vs 4.62%, RR 0.86, 95% CI 0.83-0.89, p<0.001), but higher rates of stroke (1.42% vs 1.32%, RR 1.07, 95% CI 1.00-1.15, p=0.04), and MI (1.86% vs 1.60%, RR 1.16, 95% CI 1.10-1.24, p<0.001) within 3-years of the ED visit when compared to patients with ARD and no history of CUD after propensity matching.

Conclusion: The findings of this study showed that over the last 20 years, cannabis use was associated with higher risks of mortality, stroke, and MI for emergency department patients. This study further expands on current literature regarding the cardiovascular risks of cannabis use and can help to guide further policymaking and clinical decision-making in treating these patients.



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172 A Prospective Trial of the Effect of Canadian Syncope Risk Score Recommendations on Emergency Physician Management of Unexplained Syncope

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Study Objective: The validated Canadian Syncope Risk Score (CSRS) has performed well in predicting 30-day adverse events in emergency department (ED) patients with syncope unexplained by a serious cause. The effect of CSRS-based management recommendations on community physician decision-making is unknown. We sought to evaluate physician response to CSRS-based decision support at 2 crossroads: disposition (home vs not) and, for home-going patients, adherence to 30-day event monitoring recommendations.

Methods: This prospective evaluation of clinician behavior was included in a validation study of the CSRS in 5 U.S. community EDs for patients ≥16y old. After determining that syncope was at that time unexplained by a serious cause, physicians accessed a web-based decision support tool, which helped calculate the CSRS and provided risk-based recommendations: Low-risk—at least 2h of continuous cardiac monitoring and, if reassuring, discharge home with primary care follow-up; home monitoring was not indicated. Medium- and high-risk—at least 6h of continuous monitoring, with 30-day event monitoring when suitable for discharge. Cardiology phone consultation was advised for high-risk patients. We identified physicians' intended disposition plan (home vs admission) by requiring they denote it prior to both the CSRS calculation and receipt of risk-based recommendations. We defined admission as admission to a short-term observation or inpatient unit. We measured change in disposition from intended to actual. For patients discharged directly home, we measured adherence to home monitoring recommendations. Outcomes were captured on manual chart review. We correlated reception of home monitoring with adjudicated 30-day serious arrhythmic outcomes (eg, sinus pause >3 seconds, sustained ventricular tachycardia), as used in CSRS research.

Results: In this 9-month interim analysis (03/01/22 to 11/30/22) of a 2+-year trial, 233 emergency physicians (<1% residents) denoted their intended disposition for 1,013 patients, 54.9% of whom were female, median age 68 years (interquartile range 54-82). After receiving decision support, physicians changed disposition for 145 patients (14.3%): the proportion intended for admission but discharged home (20.3%; 65/319) was higher than that intended for home care but admitted (11.5%; 80/694) (P<0.01). Change in disposition varied by risk strata (Table). Overall, 679 (67.0%) patients were discharged home, which decreased significantly with ascending risk strata (Table). Adherence to home monitoring recommendations was common (76.3%) but decreased with increasing risk strata (Table). Few home- going patients (n=7; 1.0%) developed a 30-day serious arrhythmic outcome: 6 (3.2%) among monitored and 1 (0.2%) among non-monitored patients (Table). Arrhythmic outcomes were detected in 3 low-risk patients discharged home with monitoring. No patients discharged home died <30 days.

Conclusion: In this multicenter prospective trial of decision support based on the CSRS, decision support informed changes in disposition in 1 in 7 patients. CSRS with risk-based recommendations more commonly led to reductions than escalations in disposition. Among patients discharged home, physicians often adhered to 30-day event monitoring recommendations. Home monitoring in select low-risk patients was serviceable in detecting rare arrhythmic outcomes. Forthcoming analysis of the full dataset will enhance our understanding of the impact of CSRS-based decision support on physician level-of-care decision-making and outcome detection.

Table. Effect of CSRS-based decision support (1) on change in disposition for the entire cohort and (2) on adherence to monitoring recommendations for home-going patients, with 30-day serious arrhythmia outcomes.

	Canadian Syncope Risk Class (Score Range) N=1,013		
Characteristic	**Low** (-3 to 0)	**Medium** (1 to 3)	**High** (4 to 11)
ALL PATIENTS	N=551 (54.4)*	N=343 (33.9)	N=119 (11.7)
Change in Disposition			
Downgraded from admission to discharge home	23 (4.2)	36 (10.5)	6 (5.0)
Upgraded from discharge home to admission	31 (5.6)	36 (10.5)	13 (10.9)
Sum	54 (9.8)	72 (21.0)	19 (15.9)
HOME-GOING PATIENTS	N=485 (71.4)	N=172 (25.3)	N=22 (3.2)
Physician Adherence to Monitoring Recommendations			
Adherent	408 (84.1) discharged without monitoring	101 (58.7) discharged with monitoring	9 (40.9) discharged with monitoring
Overruled	77 (15.9) discharged with monitoring	71 (41.3) discharged without monitoring	13 (59.1) discharged without monitoring
Serious Arrhythmia Outcomes within 30 Days			
With home monitoring, n/N	3/77	3/101	0/9
Without home monitoring, n/N	1/408	0/71	0/13
* n (column %) throughout except Serious Arrhythmia Outcomes (n/N)			

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173 Radiation-Reducing Strategies in Antenatal Pulmonary Embolism Diagnostics: Differences in Testing Efficiency and Specialty-Specific Use Patterns

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Study Objectives: Pulmonary vascular (PV) imaging (ie, computed tomography pulmonary angiography and lung scintigraphy) during antenatal pulmonary embolism (PE) diagnostics exposes the pregnant patient and fetus to radiation with associated long-term malignancy risks. Two radiation-reducing strategies are available: (1) PE can be ruled in if compression ultrasonography (CUS) diagnoses deep vein thrombosis (DVT) in patients with symptoms suggestive of acute PE, allowing a presumptive PE diagnosis; (2) PE can be safely ruled out using validated D-dimer (DD)-based algorithms, eg, pregnancy-adapted YEARS and revised Geneva algorithms. To investigate contemporary practice, we compared prevalence and efficiencies of radiation-reducing strategies overall and by setting: emergency department (ED) vs obstetrics (OB), which included Labor and Delivery and OB clinics.

Methods: We undertook this retrospective cohort study across 21 U.S. community medical centers from 10/01/2021 through 3/31/2023. We included pregnant outpatient health plan members who underwent PE diagnostics with DD, CUS, or PV imaging. To focus on CUS as a rule-in strategy, CUS was included only if completed before PV imaging was ordered, if applicable. To identify physician intention, we included PV imaging that was pursued, which encompassed completed imaging and imaging that was intended but declined by the patient. We calculated the number needed to test (NNT) to forgo 1 PV imaging study by dividing the number of those tested by the number of those who were spared PV imaging. The safety outcome of DD-based rule-out strategies was the 90-day diagnostic failure rate, ie, the 90-day incidence of adjudicated venous thromboembolism (VTE), identified by automated and manual chart review.

Results: Among 679 outpatients undergoing diagnostic testing, 593 (87.3%) were evaluated in ED and 86 (12.7%) in OB settings. Median age was 30 years (interquartile range 26-34). Among 303 patients who underwent PV imaging, PE was diagnosed in 5 (1.7%). Overall, 214 (31.5%) underwent CUS, the prevalence of which was similar across settings: 31.2% of ED and 33.7% of OB patients. Patients with DVT symptoms underwent CUS in 50 of 58 (86.2%) ED and 15 of 15 (100%) OB patients (P=0.19). Those without DVT symptoms underwent CUS in 135 of 535 (25.2%) ED and 14 of 71 (19.7%) OB patients (P=0.31). Yield was low overall (0.9% [2/214]) and varied by DVT symptoms: 3.1% (2/65) with vs 0% (0/149) without (P=0.09). Both DVT patients with PE symptoms were spared PV imaging. CUS NNT was 107. Overall, 496 (73.0%) underwent DD testing, varying by trimester (84.2% [1st], 78.8% [2nd], 60.0% [3rd], P<0.001) and setting: 80.8% of ED and 19.8% of OB patients (P<0.001). Physicians documented which risk score was used in 20.8% (103/496) of DD-tested patients, with YEARS the most common (80.6% [83/103]). PV imaging was not pursued in 96.6% (143/148) of those with low (<0.5 mg/L) and 46.3% (76/164) with intermediate DD values (≥0.5<1.0 mg/L). DD NNT was 1.4. Index PE (including presumptive and PV imaging-confirmed PE) was more prevalent in patients with higher DD values: 0% (0/148) with low, 0% (0/164) with intermediate, and 3.3% (6/184) with high D-dimer values. No 90-day VTE or deaths occurred following PE rule-outs.

Conclusion: Radiation-reducing strategies were commonly used during antenatal PE diagnostics in this community health setting, with DD algorithms far more efficient than CUS (NNT 1.4 vs 107, respectively). Patterns of D-dimer use were significantly different between ED and OB settings. Opportunities exist in both specialties to improve use of evidence-based radiation-reducing strategies in antenatal PE diagnostics. Efficiencies could be improved by employing symptom-driven CUS and more comprehensive DD use across settings and trimesters.

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174 Comparison of Large-Bore Mechanical Thrombectomy to Other Therapies for High-Risk Pulmonary Embolism Using Propensity-Score Matched Analysis of the FLAME Study

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Study Objectives: Mortality for high-risk pulmonary embolism (PE) patients remains high with in-hospital rates exceeding 25%. Results from the recent FLAME study of high-risk PE patients showed lower rates of in-hospital mortality and other adverse outcomes in patients treated with mechanical thrombectomy than in patients receiving other contemporary treatments, but disease severity and comorbidity differences make comparisons challenging. The objective of this study was to use propensity score matching (PSM) to obtain more comparable treatment cohorts for outcome comparisons.

Methods: The FLAME study (NCT04795167) evaluated outcomes in acute, high-risk PE patients treated with large-bore mechanical thrombectomy with the FlowTriever (FT) System (Inari Medical, Irvine CA) or other contemporary treatment options. All treatments were physician-selected. Mechanical thrombectomy patients were enrolled in the FT Arm, while those receiving any other therapy were enrolled in the Context Arm. Patients were followed through hospital discharge or 45 days, whichever was sooner. The primary endpoint was a composite of in-hospital adverse events: all-cause mortality (ACM), clinical deterioration, bailout to an alternate therapy, and major bleeding. PSM was performed by matching patients 1:1 from the FT and Context Arms on 2 disease severity variables: presence of advanced cardiogenic shock as assessed by the Society for Cardiovascular Angiography and Intervention (SCAI) shock stage (a supervariable of multiple clinical features of cardiogenic shock) and presence of centrally located thrombus. Logistic regression was then used to adjust for additional baseline differences.

Results: The FLAME study enrolled 115 patients, including 53 in the FT Arm and 61 in the Context Arm. Data for PSM were available in 106 patients, from which 38 matched pairs were identified (n=76, 72%). Context Arm treatments in the matched cohort included systemic thrombolytics (73.3%), anticoagulation alone (21.1%), and catheter-directed thrombolytics (5.3%). In the matched cohorts, the primary endpoint was met in 18.4% of FT Arm vs. 55.3% of Context Arm patients (Table, P=0.0017). ACM was 0% in the FT Arm vs. 18.4% in the Context Arm (P=0.0116). Bailout rates were 5.3% in the FT Arm vs. 28.9% in the Context Arm (P=0.0125). Logistic regression in the matched cohorts revealed that compared to Context Arm patients receiving other therapies, patients who received FT treatment were 86% less likely to meet the primary endpoint (OR=0.14; 95% CI=0.03-0.51; P=0.0050) and were 93% less likely to undergo bailout therapy (OR=0.07, 95% CI=0.00-0.43, P=0.0165).

Conclusion: After matching on shock status and thrombus location and adjusting for other covariates, high-risk PE patients treated with FlowTriever mechanical thrombectomy were 86% less likely (OR=0.14) to experience adverse clinical outcomes compared to patients who received a different treatment. These data suggest that large-bore thrombectomy is both safe and effective in high-risk PE patients, though additional evidence from randomized controlled trials is warranted.