

Arterial Dissection in Trauma Patients in the Absence of Traumatic Brain Injury and Cervical Spine

Trauma: A Population-Based Study of the Detroit Metropolitan Area from 2006-2014

Justin G Thomas DO; Richard D. Fessler MD, FACS; R David Hayward PhD

RDF, RDH: Neurosurgery, Department of Surgery, St. John Hospital & Medical Centers, Detroit, Michigan

JGT: Neurosurgery, Department of Surgery, College of Human Medicine, Michigan State University, Providence-Providence Park Hospitals, Southfield, Michigan

Table 1

Disease	ICD-9 Code	Condition
Vascular Dissection	443.21	Dissection of carotid artery
	443.24	Dissection of vertebral artery
	433	Occlusion and stenosis of precerebral arteries
	434	Occlusion of cerebral arteries
	435	Transient cerebral ischemia

Table 1: specific ICD-9 codes used for identifying patients with dissection.

Table 2

Category	Unadjusted	p	Age-Adjusted	p2
Age Category	M [95% CI]		M [95% CI]	
Children (< 18)	0.3 [0.3, 0.4]	< .001		
Younger Adults (18 – 39)	0.7 [0.6, 0.7]	a		
Middle Adults (40 – 64)	2.2 [2.1, 2.3]	< .001		
Older Adults (65+)	5.2 [5.1, 5.3]	< .001		
Gender				
Male	4.1 [4.0, 4.2]	a	3.7 [3.6, 3.8]	a
Female	4.4 [4.3, 4.5]	< .001	3.0 [2.9, 3.1]	< .001
Race/Ethnicity				
White	3.6 [3.5, 3.7]	a	3.2 [3.1, 3.3]	a
Black	2.5 [2.4, 2.6]	< .001	3.4 [3.2, 3.6]	0.03
Hispanic	1.7 [1.2, 2.2]	< .001	3.1 [2.7, 4.2]	0.762
Other	3.1 [2.7, 3.4]	0.003	3.6 [3.2, 4.0]	0.085
Trauma Mechanism				
Fall	4.2 [4.1, 4.3]	< .001	3.5 [3.3, 3.7]	< .001
Gunshot Wound	1.0 [0.8, 1.3]	< .001	3.9 [3.1, 5.1]	0.006
Motor Vehicle Traffic	1.0 [0.8, 1.3]	< .001	2.8 [2.5, 3.2]	0.666
Other	1.6 [1.4, 1.7]	a	2.8 [2.6, 2.9]	a
Insurance Type				
Private	2.0 [1.9, 2.1]	a	3.0 [2.9, 3.2]	a
Medicare	4.8 [4.7, 4.8]	< .001	3.6 [3.4, 3.8]	< .001
Medicaid	1.8 [1.7, 1.9]	0.02	4.1 [3.7, 4.4]	< .001
Self-Pay	0.9 [0.7, 1.0]	< .001	2.0 [1.7, 2.3]	< .001
Other	1.0 [0.8, 1.2]	< .001	2.0 [1.7, 2.4]	< .001
Neighborhood Poverty Rate				
Lowest Quartile (< 6.5%)	3.3 [3.2, 3.5]	< .001	2.9 [2.8, 3.1]	< .001
2 nd Quartile (6.5% - 10.8%)	3.6 [3.5, 3.7]	< .001	3.2 [3.0, 3.3]	< .001
3 rd Quartile (10.8% - 18.7%)	3.7 [3.6, 3.8]	< .001	3.5 [3.3, 3.6]	0.257
Highest Quartile (18.7%+)	3.0 [2.9, 3.1]	a	3.5 [3.4, 3.7]	a

Table 2: Percent of trauma patients (excluding traumatic brain injury and cervical spine injury) with arterial dissection (a: reference cohort)

Results

A total of 406,245 trauma patients were identified and 23,822 excluded because of TBI or CSI, entailing an overall sample size of 383,423 individuals. Arterial dissection was identified in 12,812 patients with an overall incidence of 3.3%. The occurrence of dissection increased significantly with age, as adults 65+ years of age were over five times more likely to develop a dissection than younger adults. Logistic regression was performed to account for the significant relationship between older age and arterial dissection. Male gender, falls and gunshot wounds were significantly more likely to suffer arterial dissection, as were Medicare and Medicaid beneficiaries and those living in neighborhoods below the median poverty level.

Conclusions

The current study provides insight into patients at increased risk for arterial dissection following non-primary CNS related trauma.

Learning Objectives

1. Identify risk factors for cerebral arterial dissection after trauma
2. Recognize the age-related changes associated with arterial dissection after trauma
3. Understand the socioeconomic relationship between trauma and cerebrovascular dissections

References

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Introduction

Traumatic brain injury (TBI) and cervical spine injury (CSI) are associated with an increased risk of arterial dissection. The purpose of this study is to determine the occurrence of arterial dissection in trauma patients without TBI or CSI.

Methods

Data was obtained from the Agency for Health Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP). Between 2006 and 2014, trauma patients were identified using ICD-9 codes 800 – 959 from the Michigan State Inpatient Database of patients living in the Detroit Metropolitan Statistical Area. Patient level data was merged with socioeconomic data from the US Census Bureau. Patients with TBI and CSI were excluded. Patients with dissection coincident with trauma were identified using specific ICD-9 codes (Table 1). Incidence of traumatic arterial dissection (non-CNS related) was determined. Subgroup analysis (age, gender, race, trauma mechanism, insurance type, and socioeconomic class) was performed to identify non-CNS trauma populations at risk for developing arterial dissection. Frequencies and confidence intervals were computed using SAS Proc SurveyFreq. Age-adjusted