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The association between insurance status and diagnostic imaging for acute abdominal pain among emergency department patients in the United States, 2005-2014

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Background

Acute abdominal pain (AAP) is one of the most common complaints in the Emergency Department (ED). Rapid diagnosis is essential and is often achieved through imaging. Computed tomography (CT) is widely considered an exemplary test in the diagnosis of AAP in adult patients. Previous studies have shown disparities in healthcare treatment based on insurance status.

Purpose

Our objective was to assess the association between insurance status and frequency of CT ordered for adult patients presenting to the ED with AAP from 2005-2014.

Methods

This study used the National Hospital and Ambulatory Medical Care Survey: Emergency Department Record (NHAMCS) database, which collects data over a randomly-assigned four week period in the 50 states and DC, to perform an observational retrospective analysis of patients presenting to the ED with AAP. Patients with Medicaid, Medicare, or no insurance were compared to patients with private insurance. The association between insurance status and frequency of CT ordered was measured by obtaining odds ratios along with 95% CIs adjusted for age, gender, and race/ethnicity.

Figures & Tables

Table 1: Characteristics of adult patients with acute abdominal pain in a national sample of emergency departments in the United States, 2005-2014.

Characteristics	Uninsured %	Medicare %	Medicaid %	Private %	
Sex					< 0.001
Female	60.3	60.3	75.9	65.8	
Male	39.7	39.7	24.1	34.2	
Age					< 0.001
18-24	21.9	2.8	23.3	15.1	
25-34	29.1	12.6	31.7	25.0	
35-44	23.8	17.9	18.4	23.5	
45-54	17.5	26.8	17.2	22.2	
55-65	7.71	40.0	9.4	14.2	
Race/ethnicity					< 0.001
White	55.3	68.5	56.2	71.2	
Black	24.4	21.3	24.2	13.6	
Hispanic	18.6	8.8	16.9	12.1	

Table 2: Unadjusted and adjusted associations between diagnostic tests ordered, insurance status and other patient characteristics among patients presenting with acute abdominal pain to selected national emergency departments in 2005-2014.

Characteristics	Unadjusted			Adjusted		
	OR	95% CI	p-value	OR	95% CI	p-value
Insurance						
Uninsured	1.00	0.79-1.28	0.975	1.10	0.87-1.40	0.405
Medicare	1.16	0.91-1.47	0.238	1.03	0.80-1.31	0.846
Medicaid	0.71	0.57-0.87	0.001	0.80	0.64-0.99	0.046
Sex						
Female	0.78	0.67-0.91	0.002	0.84	0.72-0.98	0.027
Age						
25-34	1.12	0.91-1.37	0.294	1.07	0.87-1.32	0.494
35-44	1.59	1.25-2.02	< 0.001	1.50	1.17-1.92	0.001
45-54	1.63	1.31-2.04	< 0.001	1.55	1.23-1.95	< 0.001
55-65	1.74	1.33-2.26	< 0.001	1.61	1.22-2.14	0.001
Race/Ethnicity						
Black	0.58	0.47-0.70	< 0.001	0.58	0.48- 0.71	< 0.001
Hispanic	0.86	0.67-1.01	0.225	0.89	0.69-1.14	0.349
Other	0.77	0.50-1.21	0.259	0.81	0.50-1.31	0.385

Findings

Individuals receiving Medicaid are 20% less likely to receive CT than those with private insurance (OR 0.8, CI 0.6-0.99, p=0.046). Those on Medicare or who are uninsured have no difference in odds of obtaining a CT scan as compared to patients with private insurance. Additional findings are that females are 15% less likely to receive CT scan, and blacks are 40% less likely.

Discussion

Our study shows that patients with Medicaid who presented with AAP were less likely to receive the same standard of diagnosis as those with private insurance. Although many physicians may not be aware of a patient's insurance status when they present to the ED, our results suggest that physicians may have an implicit bias based on insurance status when treating patients. The study also uncovered a possible disparity based on race; blacks had lower odds of receiving the same standard of care when compared to whites. In order to ensure equitable treatment among all patients, more research on provider bias is needed, as well as strategies to eliminate these biases.

Implications for Practice

Patients on Medicaid are significantly less likely to receive a CT when presenting to the ED with AAP. Differences in diagnostic care may correlate to inferior health outcomes in patients without private insurance.