Impact of Cocaine Use on Acute Ischemic Stroke Patients: Insights from Nationwide Inpatient Sample in the United States

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Background:
Previous studies have reported a 19% increase in the incidence of strokes due to cocaine use in the last two decades. The rise in cocaine-associated morbidity and mortality posed it as a major public health concern. Impacts on health care economies due to stroke-related disability is devastating owing to medical cost, rehabilitation cost and cost due to loss of workforce. A direct or indirect burden of around $68.9 billion was imposed on the US healthcare owing to strokes in 2009, a major part of which was comprised of strokes as a result of illicit drugs use

Introduction:
Cocaine is the third most common substance of abuse after cannabis and alcohol. The use of cocaine as an illicit substance is implicated as a causative factor for multisystem derangements ranging from an acute crisis to chronic complications. Vasospasm is the proposed mechanism behind adverse events resulting from cocaine abuse, acute ischemic strokes (AIS) being one of the few. Our study looked into in-hospital outcomes owing to cocaine use in the large population based study of AIS patients.

Methods:
Using the national inpatient sample (NIS) database from 2014 of United States of America, we identified AIS patients with cocaine use using International Classification of Disease, Ninth Revision (ICD-9) codes. We compared demographics, mortality, in-hospital outcomes and comorbidities between AIS with cocaine use cohort versus AIS without cocaine use cohort.

Results:
Acute ischemic strokes (AIS) with cocaine group consisted of higher number of older patients (> 85 years) (25.6% versus 18.7%, p <0.001) and females (52.4% versus 51.0%, p <0.001). Cocaine cohort had higher incidence of valvular disorders (13.2% versus 9.7%, p <0.001), venous thromboembolism (3.5% versus 2.6%, p<0.03), vasculitis (0.9% versus 0.4%, p <0.003), sudden cardiac death (0.4% versus 0.2%, p<0.02), epilepsy (10.1% versus 7.4%, p <0.001) and major depression (13.2% versus 10.7%, p<0.007). The multivariate logistic regression analysis found cocaine use to be the major risk factor for hospitalization in AIS cohort. In-hospital mortality (odds ratio (OR)= 1.4, 95% confidence interval= 1.1-1.9, p <0.003) and the disposition to short-term hospitals (odds ratio (OR)= 2.6, 95% confidence interval = 2.1-3.3, p <0.001) were also higher in cocaine cohort. Venous thromboembolism was observed to be linked with cocaine use (OR= 1.5, 95% confidence interval= 1.0-2.1, p < 0.01) but less severely than vasculitis (OR= 3.0, 95% confidence interval= 1.6-5.8, p <0.001).

Conclusion:
To our knowledge, this is one of the very few studies demonstrating the effects of cocaine use on stroke using the nationally representative data source. Our results displaying the amplitude of the mortality in an AIS-cocaine cohort raised the question whether to consider cocaine as a risk factor in all AIS patients or not. Further research is warranted to evaluate the pathogenesis and health care burden due to cocaine-induced stroke.