Cervical Artery Dissection-Related Stroke: Vascular Risk Factors May Have a Role

Sir,

Dissection is a relatively uncommon but important cause of stroke. The epidemiological data from a stroke registry in France suggest that they account for approximately 2% of all strokes and the incidence rate is 2.97/100,000/year. Trauma, direct or indirect, is well known to be a trigger leading to cervical artery dissection-related stroke. But, is this dissection, more common in vessels, already exposed to vascular risk factors? There is a paucity of evidence to answer this question. To address this gap in knowledge, we designed this study to document the presence of certain predefined risk factors in patients with extracranial cervical artery dissection causing stroke.

We carried out a retrospective and prospective observational study over a two-year period at a tertiary care referral center. Patients who were 18 years or older and with a confirmed diagnosis of ischemic stroke due to extracranial cervical (carotid or vertebral) artery dissection proven by angiography were included in the study. The presence or absence of the following risk factors were documented: History of unaccustomed physical activity or trauma in the preceding one week, history of cervical manipulation in the preceding two weeks, hypertension (treated or untreated), diabetes (treated or untreated), smoking, hypercholesterolemia (>200 mg/dL), overweight (BMI >27 kg/m²), alcohol consumption at least once a week, coronary artery disease (CAD), migraine, family history of stroke, past history of stroke, and preceding infection in the previous week. Assuming from previous studies that 2% of all ischemic strokes are caused by dissection, an online sample size calculator for a descriptive study for dichotomous outcome variable was used. A sample size of 30 was estimated using level of confidence as 95% and absolute error of margin of 5%. Descriptive statistical analysis was carried out in the study. Data analysis was done using statistical package for social sciences Version 20.0. Prior clearance was taken from the institutional ethical committee. Informed written consent was taken from all patients or their next of kin.

A total of 30 patients with dissection and ischemic stroke were included in the study. Diagnosis of dissection was confirmed by digital subtraction angiography in 27 patients while magnetic resonance angiography was used to confirm in three patients. Twenty six (86.7%) were males. Mean age was 42.3 years (±10.1) with range of 23–67 years. Eighty percent (24) of the patients were below 50 years. Majority (52%) patients had the dissection in winter defined as November to February followed by monsoon (32%) defined as July to October. The dissection occurred in 11 (36.7%) patients in the carotid artery and 19 (63.3%) patients in the vertebrobasilar artery. Most common segment involved in vertebral artery dissection was V3 (45.8%) followed by V1 and V2 (20.8% each). Five patients had more than one vertebral artery segment involved. Isolated dissection of V4 did not occur. One patient had extension of vertebral artery dissection to basilar artery associated with subarachnoid hemorrhage and ischemic stroke. Most common site involved in carotid artery dissection was proximal extracranial internal carotid artery (90.9%). One patient had involvement of common carotid artery (9.1%). Headache and neck pain occurred in majority of patients. Cranial nerve deficit was noted in 66.7% of patients. All patients with carotid artery dissection had upper motor neuron seventh cranial nerve involvement. Nine patients (47.3%) with vertebrobasilar artery dissection had cranial nerve involvement. Eight of these (42.1%) had ninth and tenth involvement, four (21%) had lower motor neuron seventh involvement, three (15.7%) had fifth, and one each (5.2%) had sixth, eighth, and twelfth cranial nerve involved, respectively.

Letters to the Editor
Mostly (31.6%) patients presented as multiple (at least 3) lower cranial nerves involvement. Horner syndrome was present in five (45.4%) of the patients with carotid artery dissection and seven (36.8%) of patients with vertebral artery dissection. Carotid bruit was noted in two (18.1%) patients of carotid artery dissection. History of unaccustomed physical activity or trauma in the preceding one week or cervical manipulation was associated with 83.3% (25) of patients with dissection. If five common vascular risk factors, namely, smoking, hypertension, diabetes, hypercholesterolemia, and overweight (defined as BMI >27 kg/m$^2$) were taken into consideration, then 86.7% of patients had at least one of these five vascular risk factors. More than half (53.3%) had at least two of these risk factors.

There is ambiguity in the existing literature regarding the association of vascular risk factors with stroke due to dissection. A very large, multicentric, and elegantly conducted study by the CADISP investigators found that hypertension could be a risk factor for cervical artery dissection.[2] However, they also found that hypercholesterolemia and being overweight (BMI 25–30 kg/m$^2$) had an inverse relationship with cervical artery dissection. Other studies have found an association between dissection and lesser known or uncommon vascular risk factors like homocystinemia and Fabry’s disease.[3-5] Contradictory findings were recorded in a more recent study by Amsalem et al. They found an independent association of dissection related stroke with CAD but an inverse association with other vascular risk factors like hypertension and dyslipidemia.[6] Our data suggest that trauma plays a pivotal role in causing dissection, but it is usually in the presence of a vascular risk factor. Traumatic dissection is likely to occur more easily in a vessel compromised by exposure to vascular risk factor(s). The chief limitation of our study was that it had no control group.

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Conflicts of interest
There are no conflicts of interest.

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