Influence of Age on Carotid Atheroma in Patients with Reversible Ischemic Attacks

Gianluca Landi, Mario Guidotti, and Frida Valsecchi

To evaluate the influence of age on carotid atheroma we reviewed the angiographic findings in 120 patients with reversible ischemic attacks. The prevalence and severity of atherosclerotic lesions increased significantly with age, and this difference persisted after adjusting for hypertension. These results may at least partly explain the poor long term prognosis for elderly subjects with reversible ischemic attacks, and underscore the importance of taking age into account when relating clinical and angiographic findings in patients with cerebrovascular ischemia. (Stroke 1987;18:43-45)

The main risk factors for atherothrombotic stroke are advanced age and hypertension. On the other hand, the association of hypertension with cerebral ischemia is strikingly related to age, surprisingly few studies have examined the influence of this factor on the prevalence of carotid atheroma. In their report on autopsy populations, Baker et al found a remarkable increase in the frequency and amount of cerebral atherosclerosis with advancing age, but they investigated only the circle of Willis and not the extracranial vessels. Poser et al observed “a definite increase of incidence of demonstrable occlusive or obstructive lesions . . . with advancing age” in 250 patients with cerebrovas-
circular disease. However, their results were not statistically significant on retrospective analysis; moreover, carotid and vertebral arteries were not considered separately, and no mention was made of the lesions' severity in relation to age. Candelise et al. devised an angiographic score to quantify atherosclerotic lesions in both the extra- and the intracranial circulation. Although age was significantly related to altered extracranial angiography, neither the extra- nor the intracranial score for severity of atheroma was associated with age. Again, the results included the vertebral-basilar circulation, where atheroma is probably less frequent and normal angiography more common. In a recent angiographic study, Ford et al. used regression analysis to investigate the relative importance of several risk factors on the severity of carotid bifurcation atherosclerosis in 121 patients, 80 of whom had experienced cerebral ischemic attacks. Age correlated best with degree of stenosis, but it accounted for only 13% of the variability in the extent of atheroma.

In the present study we examined the whole carotid artery including its intracranial portion, which is a well-known site of atherosclerotic lesions, in a homogeneous group of patients with reversible ischemic attacks in the ipsilateral territory. Our results demonstrate a significant positive correlation between age and both prevalence and severity of carotid atheroma. Although caution is necessary in the interpretation of angiographic studies where patients are probably selected on the basis of younger age and better general conditions, our findings are supported by those of Röderer et al., who observed an increased prevalence of severe bifurcation lesions with age in an unselected group evaluated noninvasively with duplex scanning.

Hypertension contributes to the development and extent of cervicocranial atherosclerosis. Its prevalence was not significantly different among our three groups, but because a trend showing a higher frequency in elderly patients was apparent, analyses were repeated after adjusting for its presence. Since the observed differences persisted with only a slightly lower significance, we conclude that in patients with reversible ischemic attacks the prevalence and severity of carotid atheroma increase with age independently of hypertension.

Our results underscore the importance of taking age into account when clinical findings are related to angiography and may partly explain the poor prognosis frequently observed in elderly patients with reversible ischemic attacks. references


**KEY WORDS** • cerebral ischemia • reversible ischemic attacks • cerebral angiography • atherosclerosis
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