Risk factors in vascular dementia

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Vascular dementia (VD) is a medical condition in which dementia is caused by a vascular damage of Central Nervous System (CNS) of ischemic (more frequently) or haemorrhagic (less frequently) origin. After Alzheimer's disease (AD), VD represents the second most frequent form of cognitive impairment; indeed, about 20%-25% of all dementias is caused by cerebrovascular disease. Prevalence data suggest that in Italy VD is present in about 150.000 individuals; it represents a negative prognostic factor as it is associated with an increase in total mortality compared with both general population and patients with AD. From the anatomical point of view, VD may be associated with: 1. Large vessel diseases, with occlusion of large intra-cranial arteries and consequent large cortical-subcortical cerebral infarctions; 2. Small vessel disease, with occlusion of small penetrating arteries and small sub-cortical ischemic lesions and/or leukoarasiosis. Cerebrovascular disease, and small vessel disease in particular, may also influence the clinical expression of AD in older individuals (Snowdon et al. JAMA 1997), probably by reducing the "cerebral reserve". Furthermore, it has to be underlined that mixed brain pathologies (including cerebrovascular disease, AD, and synucleinopathies) account for most of dementia cases in older persons (Schneider et al. Neurology 2007).

VD is associated with common and potentially modifiable risk factors. In the absence of an efficacious therapy for VD, prevention/treatment of these risk factors appears the only rationale way to prevent VD associated mordibity/mortality. Hypertension, diabetes mellitus, alcohol abuse, cigarette smoking, obesity and metabolic syndrome, previous myocardial infarction, advanced age, male gender, and low formal education have been associated with VD.

The role of hypertension in stroke and VD is well known. For example, in the Honolulu-Asia study hypertension in adult age was associated with cognitive impairment in the elderly; moreover, the rate of cognitive decline was proportional to

the degree of systolic hypertension. Several studies, including the SYST-EUR study, have shown the the treatment of hypertension, with calcium-channel blockers or ACE inhibitors, was associated with a significant reduction in the incidence of dementia.

Diabetes has been associated with the prevalence of dementia, both VD and AD (Lu et al. PlosOne 2009); this association might be related to the association of diabetes with atherosclerosis and small vessel disease, but might be also mediated by insulin resistance (Carantoni, Zuliani et al. Dem Geriatr Cogn Dis 2000).

The studies that have evaluated the possible association between dyslipidemia and dementia have reported conflicting results. Although hypercholesterolemia in adult age might be associated with incidence of dementia (Hofman et al. Lancet 1997; Kivipelto et al. BMJ 2001), low levels of total cholesterol and HDL-C have been reported in older subjects with dementia (Zuliani et al. BMC Geriatrics 2001; Zuliani et al. J Geront Med Sci 2010).

Finally, in the Zutphen Elderly Study it has been shown that cigarette smoking and alcohol abuse might have a negative role on cognitive functions in older individuals.

Since it has been suggested that vascular risk factors have a measurable negative effect on CNS and cognitive performance, their correct management might reduce the impact of VD, but also AD, in the older population.