Angiotensin-converting enzyme 2

Angiotensin-converting enzyme 2 (ACE2) is an exopeptidase that catalyzes the conversion of angiotensin I to the nonapeptide angiotensin or the conversion of angiotensin II to angiotensin.

ACE2 has direct effects on cardiac function and is expressed predominantly in vascular endothelial cells of the heart and the kidneys.

ACE2 is not sensitive to the ACE inhibitor drugs used to treat hypertension.

ACE2 expression is relatively high in endothelial cells (ECs), bone marrow mesenchymal stem cells (BMSCs), and neural precursor cells (NPCs). Cathepsin B (Cat B) and cathepsin (Cat L) were also strongly expressed in various cell clusters within the glioblastoma microenvironment. Immunofluorescence staining of glioma and normal brain tissue chips further confirmed that ACE2 expression co-localized with CD31, CD73, and nestin, which confirmed the susceptibility to SARS-CoV-2 of nervous system cells, including ECs, BMSCs, and NPCs, from clinical specimens.

These findings reveal the mechanism of SARS-CoV-2 neural invasion and suggest that special attention should be paid to SARS-CoV-2-infected patients with neural symptoms, especially those who suffered a glioma [1)].

Previous studies have shown positive evidence of linkage of the intracranial aneurysm (IA) at chromosome 7q11, 17cen, 19q13, and Xp22. These regions contain elastin (ELN), nitric oxide synthetase 2A (NOS2A), apolipoprotein E (APOE), and angiotensin-converting enzyme 2 (ACE2), which are considered to be promising candidate genes for IA. We aimed to examine the association of single-nucleotide polymorphisms (SNPs) with IA in these candidate genes.

To identify polymorphisms in NOS2A and ACE2, all exons and exon-intron boundaries were screened by direct sequencing in 30 randomly selected controls. The program tagSNPs was used to select an optimal set of haplotype-tagging SNPs. For ELN and APOE, SNPs were selected from previous reports. These selected SNPs were then genotyped in 362 cases with IA and 332 residential area matched controls. THESIAS software was used to investigate the association of alleles and haplotypes with IA by adjusting with covariates.

We genotyped 8 SNPs in ELN, 8 SNPs in NOS2A, 3 epsilon alleles in APOE and 1 SNP in ACE2. No alleles or haplotypes of 4 candidate genes revealed any significant association with IA.

Investigated polymorphisms in this study were not associated with IA [2)].

Angiotensin-converting enzyme 2 receptor

Angiotensin-converting enzyme 2 receptor.

1)
Wu B, Wang W, Wang H, Zou Q, Hu B, Ye L, Hu Y, Xie Y, Huang N, Lan Q, Cheng H, Dong J, Dai X. Single-Cell Sequencing of Glioblastoma Reveals Central Nervous System Susceptibility to SARS-CoV-2. Front Oncol. 2020 Nov 16;10:566599. doi: 10.3389/fonc.2020.566599. PMID: 33312949; PMCID: PMC7703438.
2)
Mineharu Y, Inoue K, Inoue S, Yamada S, Nozaki K, Takenaka K, Hashimoto N, Koizumi A. Association analysis of common variants of ELN, NOS2A, APOE and ACE2 to intracranial aneurysm. Stroke. 2006 May;37(5):1189-94. Epub 2006 Mar 30. PubMed PMID: 16574921.