C-type Natriuretic Peptide and its Receptors in Atherosclerotic Plaques of the Carotid Artery of Clinically Asymptomatic Patients.

Abstract:

C-type natriuretic peptide (CNP) has anti-inflammatory, anti-proliferative and anti-migratory properties. No data exist on the presence of CNP in human atherosclerotic plaques of the carotid artery. Therefore, this study aimed to analyse qualitatively the distribution pattern and characteristics of CNP and its receptors in both, early and advanced human carotid plaques, as well as in stable and unstable lesions. In addition, the aim of this study was to evaluate CNP and its receptors as possible biomarkers to predict plaque stability in advanced lesions. Advanced carotid artery plaques of 40 asymptomatic patients (20 histologically stable and 20 histologically unstable) and early arteriosclerotic lesions of three patients were analysed. Serum level of CNP was similar in patients with stable and unstable plaques (196 ± 19 pg ml(-1) vs. 198 ± 25 pg ml(-1), p = 0.948). Expression level of natriuretic peptide receptor 3 (NPR3) was significantly higher in unstable plaques compared to stable plaques (5.6 ± 1.8% vs. 1.7 ± 0.5%, p = 0.045). Expression levels of CNP and NPR2 were higher in unstable plaques but the differences were not statistically significant. The distribution pattern of CNP, NPR2 and NPR3 varied qualitatively between early and advanced carotid plaques. No relevant histological differences were observed with respect to plaque stability. This study shows the presence of CNP and its receptors in
atherosclerotic plaques of human carotid artery, with increased expression of NPR3 in histologically unstable plaques. In this study, serum CNP was not associated with histological plaque stability. In future, larger studies are required to further evaluate whether proteins of the CNP axis would be useful as biomarkers.