INTRODUCTION

Sudden sensorineural hearing loss (SSNHL) is a frequent disorder with an incidence of about 300 per 100,000 citizens per year in Germany. Pathogenesis and etiology are not completely understood. Inflammatory and vascular factors have been discussed as possible causes. The aim of this study was to examine the influence of soluble adhesion molecules on SSNHL.

METHODS AND MATERIALS

35 subjects affected by an unilateral SSNHL were included in this study. Inclusion criteria for this study were (1) hearing loss of more than 30 dB hearing level in more than 3 contiguous frequencies according to the accepted criterias of the National Institute of Health, (2) age between 18 and 70 years, (3) no history of noise exposure and (4) no history of viral infections or inward ear surgery in the past. Patients with acute infection of the affected ear, acoustic neuroma or a medical history of generalized autoimmune disease were excluded. Blood samples were obtained in each patient and control subject. Blood samples were taken at the moment of the first presentation before therapy started. Clinical chemistry determinations were made of total cholesterol, low-density-lipoprotein-cholesterol (LDL-cholesterol) and fibrinogen. The results were compared between SSNHL patients and control subjects.

RESULTS

Levels of soluble intercellular adhesion molecule-1 (sICAM-1) in sera of SSNHL patients were significantly higher (p<0.05) in patients with SSNHL compared to control subjects. Levels of interleukin-6, interleukin-8 and monocyte chemoattractant-protein-1 (MCP-1) were not affected (p>0.05). The clinical chemistry determinations showed no significant differences between patients and control subjects.

CONCLUSION

Our study revealed an association between SSNHL and typical vascular risk factors such as blood pressure, smoking. Endothelial dysfunction is not completely understood and represents an unmet medical need.

REFERENCES

2. Wether these molecules take part in SSNHL pathogenesis is still unknown. Ren et al reported about elevated serum levels of IL-6 in SSNHL patients. An increased blood viscosity might be related to elevated leukocyte adherence and may support the vascular hypothesis. Other authors report that SSNHL, co-occurring with elevated blood viscosity, might be attributed to a higher prevalence of vascular insufficiency and with a slower healing speed. This theory is consistent with the vascular hypothesis. The vascular hypothesis was attributed by different therapeutic influences of the vascular and anti-inflammatory agents. Our study does not support the vascular hypothesis. The clinical chemistry determinations were made of total cholesterol, LDL-cholesterol and fibrinogen. These parameters as well as fibrinogen and lipid values were statistically analyzed. Results: Levels of soluble intercellular adhesion molecule-1 (sICAM-1) showed increased levels of soluble adhesion molecules in SSNHL patients. The aim of this study was to evaluate the role of circulating adhesion molecules as parameters for the vascular and the inflammatory hypothesis.

The underlying pathology of sudden hearing loss is not fully understood. In this study, we have analyzed the influence of some parameters that are known to be associated with SSNHL. Our study supports the hypothesis that endothelial dysfunction might be a suitable target for therapeutic interventions in SSNHL. In contrast to Suckfull et al. who described elevated fibrinogen levels in patients affected by sudden deafness, our study revealed no association between SSNHL and typical vascular risk factors such as blood pressure, smoking. Endothelial dysfunction is not completely understood and represents an unmet medical need.

The sudden onset and the fact that the inner ear vasoespasm is provoked by a functional change in the blood vessels of the inner ear may also be a hint for a vascular cause of the disease. In contrast to Quertermous 12, we did not significantly higher hearing levels in patients affected by sudden deafness. 

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The role of soluble adhesion molecules and cytokines in sudden sensorineural hearing loss

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