



Association between Autonomic Nervous System Activity and Temporomandibular Disorders

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Introduction

There are not many studies about the connection between autonomic nervous system (ANS) activity and temporomandibular disorders (TMD). The aim of the study was to evaluate the sex-specific associations between ANS activity and TMD pain-related diagnoses in a population-based study.

Materials and Methods

The study was part of Northern Finland Birth Cohort 1966. Of the cohort members, 1964 (62.3% of those invited to oral health examination) were clinically examined as part of 46-year follow-up. TMD diagnoses were based on the modified protocol of DC/TMD (Diagnostic Criteria for TMD). Sub-diagnoses of TMD used in the present study were myalgia and arthralgia. ANS was assessed clinically by means of heart rate variability (HRV) and baroreflex sensitivity (BRS).

In the analyses, potential confounders (smoking, education, body mass index (BMI), diabetes mellitus type I, diabetes mellitus type II and usage of beta-blockers) were considered.

The logistic regression analyses, adjusted for BMI and education, were performed for associations of TMD myalgia/arthralgia diagnoses with HR and BRS while both standing and sitting for the total sample and stratified by sex.

Results

BRS while standing was statistically significantly associated with both myalgia and arthralgia diagnoses (Table 1).

- In the whole study population, those with myalgia had 12% lower standing BRS as compared to those without myalgia and those with arthralgia had 14% lower standing BRS than without this diagnosis.
- Among females standing BRS was 15% lower among those with myalgia as compared to women without myalgia and 12% lower among those with arthralgia as compared those without arthralgia.

Conclusions

- ANS activity have role in TMD pain.
- Lowered BRS seems to have an association with both TMD myalgia and arthralgia, especially among women.
- These findings refer to the association of stress response and TMD.

References

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Table 1. Association of covariates with myalgia/arthralgia, based on logistic regression, among the total sample of subjects including in the Northern Finland Birth 1966 cohort (n=1895)

Myalgia	OR	95% CI		p-value
		lower	upper	
Total				
Overweight	0.784	0.470	1.309	0.352
Obesity	1.284	0.748	2.203	0.364
Basic education	2.197	1.063	4.543	0.034
Higher education	1.133	0.713	1.802	0.597
BRS, standing	0.892	0.811	0.981	0.018
Females				
Overweight	0.948	0.535	1.682	0.856
Obesity	1.174	0.648	2.127	0.598
Basic education	2.165	0.936	5.007	0.071
Higher education	0.916	0.537	1.563	0.748
BRS, standing	0.872	0.777	0.979	0.021
Males				
Overweight	2.475	0.507	12.085	0.263
Obesity	5.450	1.042	28.500	0.045
Basic education	1.530	0.314	7.461	0.599
Higher education	0.955	0.338	2.694	0.930
BRS, standing	1.026	0.876	1.202	0.747
Arthralgia				
Total				
Overweight	0.607	0.370	0.995	0.048
Obesity	0.862	0.502	1.480	0.591
Basic education	2.839	1.343	6.001	0.006
Higher education	1.633	1.005	2.654	0.048
BRS, standing	0.878	0.798	0.965	0.007
Females				
Overweight	0.757	0.436	1.314	0.322
Obesity	0.793	0.436	1.440	0.446
Basic education	3.123	1.353	7.210	0.008
Higher education	1.334	0.764	2.327	0.311
BRS, standing	0.890	0.800	0.991	0.034
Males				
Overweight	1.972	0.397	9.788	0.406
Obesity	4.116	0.760	22.299	0.101
Basic education	0.962	0.113	8.217	0.972
Higher education	1.429	0.485	4.212	0.518
BRS, standing	0.932	0.752	1.156	0.521

BRS=baroreflex sensitivity, ref. underweight/normal weight, ref. secondary education.