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Assessment of Autonomic Dysfunction with the COMPASS-31 Test and Its Relationship with Disease Activity, Cardiovascular Risk, Anxiety, and Depression in Patients with Sjögren's Syndrome

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Abstract

BACKGROUND/AIMS: Primary Sjögren's syndrome (pSS) is a chronic, auto-immune, multisystemic inflammatory disease and this chronic inflammation may cause risk factors for autonomic dysfunction (AD) and/or cardiovascular risk. This study aimed to determine the frequency of AD in pSS patients using Composite Autonomic Symptom Score-31 (COMPASS-31) and also the relationship between disease activity and cardiovascular risks and AD, as well as to compare the symptoms of AD with healthy study participants.

MATERIALS AND METHODS: This was a cross-sectional study. The research cohort was comprised of 42 patients diagnosed with pSS and 42 healthy controls. AD was evaluated with the COMPASS-31 questionnaire. Cardiovascular risk was assessed with the 10-year Framingham Risk Score (FRS) algorithm. Body mass index, dyslipidemia, and metabolic syndrome (MetS) were recorded. In the pSS group, disease activity was evaluated with European League against Rheumatism Sjögren's Syndrome Disease Activity Index (ESSDAI) and European League against Rheumatism Sjögren's Syndrome Patient Reported Index (ESSPRI). Additionally, the Numerical Rating Scale and Hospital Anxiety and Depression Scale (HADS) were recorded.

RESULTS: Patients with pSS had a significantly higher mean total COMPASS-31 score than the controls (58.5 vs. 50.0; p=0.040). In sub-domain analysis, pSS patients exhibited significantly higher mean scores in the pupillomotor domain than controls (13.5 vs. 9.0; p=0.002). MetS (10 vs. 2; p=0.023), the mean 10-year FRS (6.0 vs. 2.0; p=0.012), HADS depression score (9.5 vs. 5.0; p=0.001) and HADS anxiety score were higher in those patients with pSS (11.3 vs. 6.7; p<0.001). COMPASS-31 was not correlated with ESSDAI or ESSPRI (p=0.128, p=0.0.66 respectively). The FRS and HADS depression score were evaluated as being effective on the COMPASS-31 score (p=0.535, p=0.465 respectively).

CONCLUSION: An increased prevalence of AD, cardiovascular risk, MetS, depression, and anxiety levels in patients with pSS was found in this study. The total COMPASS score did not correlate with disease activity. The COMPASS-31 questionnaire showed a relationship between cardiovascular risk and HAD depression symptom levels.

Keywords: Autonomic dysfunction, Sjögren's syndrome, COMPASS-31, cardiovascular risk, depression and anxiety

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INTRODUCTION

Sjögren's syndrome (SS) is an auto-immune, multisystemic inflammatory disease, characterized by decreased lacrimal and salivary gland functions. In addition, systemic involvement is common. The most affected organs are the lungs, kidneys, bladder, lymph nodes, gastrointestinal system, peripheral and central nervous system and the cardiovascular system.[1,2]

The autonomic nervous system (ANS) regulates physiological and involuntary functions in the body, such as secretion by glands, heart rate, and the control of respiration.[3] The prevalence of cardiovascular involvement was demonstrated to be approximately 61.6% in subjects with Primary Sjögren's syndrome (pSS) compared to 29.7% in healthy controls.[4] Autonomic dysfunction (AD) may be responsible for increased cardiovascular risk in pSS. In cardiovascular events, reduced heart rate is a major sign of AD.[5] In one study, AD, which was common among patients with pSS, was linked with systemic disease activity.[6] PSS is an inflammatory disease with a high inflammatory load, high levels of C-reactive protein, tumor necrosis factor-alpha, and interleukin-6 or autoantibodies against the ganglionic acetylcholine receptor which may cause AD.[7,8] These inflammatory cytokines, autoantibodies, vasculitis, and DMARDS which are used for treatment also play a role in AD and cardiovascular diseases (CVD) in pSS.

In clinical practice, it is hard to identify the AD in pSS. Various invasive and non-invasive examinations are performed in the detection of pathologies caused by ANS. For this purpose, various scores have been developed to be used in the detection of ANS problems, using information received from the patient without the need for invasive interventions. However, due to the open-ended questions contained in these evaluations, their large number of questions, the complexity of the scoring algorithms, and the low intelligibility of the questions, it is hard to use these scales in daily practice. The composite Autonomic Symptom Score-31 (COMPASS-31) test was produced with the aim of achieving a more easily applicable test.[9] COMPASS-31 is widely applicable, up-to-date, practical, and autonomic symptoms and functions are evaluated by the individuals themselves. COMPASS-31 in patients has been used for diabetes mellitus (DM), systemic sclerosis, and other inflammatory diseases.[10,11]

This study aimed to evaluate the frequency of AD in patients assessed by COMPASS-31 and its relationship with disease activity and cardiovascular risks, and fatigue in patients with pSS, as well as to compare symptoms of AD with healthy control participants.

MATERIALS AND METHODS

The research cohort comprised 42 pSS patients (42 females; mean age: 44.6±7.5 years) and 42 healthy participants (42 females; mean age: 43.8±9.7 years). 2016 ACR/EULAR classification criteria were used to diagnose pSS. Healthy participants attending the physical medicine and rehabilitation outpatient clinic for routine physical examination or hemogram measurements were enrolled as the control group. This cross-sectional study was carried out with the permission of the Hitit University Çorum Erol Olçok Training and Research Hospital Ethics Committee (approval number: 2023-128, date: 01.11.2023) and all protocols involving human subjects were conducted in strict accordance with the ethical guidelines outlined by the institutional and/or the national research governing body, as well as the Declaration of Helsinki.

We calculated the study's sample size based on the study by Tecer et al.[12] The type 1 error was 0.05 and the test power was 0.80, the minimum sample size was calculated as 27 patients in each group using the G*Power version 3.0.10 program.

Female subjects over 18 years of age were included. Those patients with a history of concomitant rheumatic disease, severe CVD such as heart failure, myocardial infarction or arrhythmia, vasculitis, DM, pregnancy, lactation, malignancy, peripheral or central nervous system diseases, and kidney or lung failure were excluded. The control group had the same exclusion criteria. The anthropometric measurements, blood lipids, and fasting glucose levels of the patients were recorded. The drugs they used were investigated. All evaluations were carried out by the same physician.

In the pSS group, disease activity was evaluated with European League against Rheumatism Sjögren's Syndrome Patient Reported Index (ESSPRI) and European League against Rheumatism Sjögren's Syndrome Disease Activity Index (ESSDAI).

ESSPRI is a patient-reported outcome which measures pain, dryness, and fatigue on a 0-10 numerical scale (0: no symptoms and 10: worst possible symptoms). An ESSPRI score of ≥5 is defined as high disease activity and a score of <5 is defined as low disease activity.[13]

ESSDAI evaluates twelve different systems. Its subdomains are glandular, articular, cutaneous, constitutional, pulmonary, lymphadenopathy, renal, muscular, hematological, peripheral nervous system, central nervous system, and biological. Total scores over seven indicate an active disease and total scores of 0-7 indicate a mild disease.[14]

The Hospital Anxiety and Depression Scale (HADS) was used to assess the anxiety and depression levels in the participants. This patient-completed questionnaire compromises two subscales: HADS anxiety and HADS depression. Both subscales consist of seven questions and each question is scored from 0 to 3. Lower scores indicate lower levels of anxiety and depression.[15]

Pain was assessed with the Numerical Rating Scale. Patients rate their pain from no pain (0 points) to the worst pain (10 points).[16]

For the assessment of AD in both groups, COMPASS-31 was used. COMPASS-31 is a test which is based on widely applicable, up-to-date, easy-to-apply, and scientific approaches in which the autonomic symptoms and functions are evaluated by the individuals themselves. It consists of 31 multiple-choice questions in 6 autonomic areas, including the orthostatic, vasomotor, secretomotor, gastrointestinal, bladder function, and pupillomotor areas. The total score was measured from the sum of all of the domains from 0 (normal) to 100 (the most severe AD).[9]

For the assessment of cardiovascular risks, anthropometric measurements (height, weight), blood pressure, waist circumference (WC), and hip circumference (HC) were measured. Blood pressure was measured noninvasively with a cuff sphygmomanometer. The waist-hip ratio was calculated as waist-to-HC. WC was measured from the midpoint of the lateral iliac points and the lowest rib and the HC was measured from the greater trochanters. Based on reports on the Turkish population, WC ≥90 cm in females is defined as as abdominal obesity.[17] Body mass index (BMI) was noted in kilograms/square meter (kg/m^2), dividing weight by the square of height. Patients were classified as obese if their BMI was ≥30 kg/m^2, based on the guidelines of the National

Institutes of Health Expert Panel.[18] Smoking status was recorded as current, former, or never.

The 10-year risk of CVD was evaluated using the Framingham Risk Score (FRS) algorithm, which assesses the main risk of heart failure, coronary artery disease, and peripheral arterial disease by incorporating the traditional CVD risk factors [age, sex, total cholesterol, high-density lipoprotein (HDL), blood pressure, smoking, and DM], in which a score of <10% indicates low, 10-19% indicates intermediate, and ≥20% indicates high risk.[19]

Metabolic syndrome (MetS) was assessed via five parameters, according to the American Heart Association/National Heart, Lung, and Blood Institute criteria: (1) abdominal obesity (WC >90 cm for females); (2) the presence of hypertension (DBP >85 mmHg and/or SBP >130 mmHg) or the use of anti-hypertensive therapy; (3) triglyceride level ≥150 mg/dL or being under hypertriglyceridemia treatment; (4) HDL level <50 mg/dL or being treated for reduced HDL; and (5) fasting plasma glucose level ≥100 mg/dL or being treated for high glucose levels.[20] Three positive parameters out of these five led to a diagnosis of MetS.

Statistical Analysis

IBM SPSS Statistics Standard Concurrent User V 26 was used in order to evaluate the data. Descriptive statistics are given as the number (n), percentage (%), mean ± standard deviation, median, and interquartile range values. The Shapiro-Wilk normality test was used to check the normal distribution of the numerical variables. The Levene test was used to check the homogeneity of the variances. Comparisons of two groups for numerical variables were performed with the t-test in Independent samples in cases of normal distributions of the data, and the Mann-Whitney U test in cases of non-normal distributions. Chi-square tests (Pearson, Continuity correction, Fisher's exact) were used in order to compare groups with categorical variables. In cases where the chi-square test results were found to be significant, the differences between the categories were evaluated with two Bonferroni corrected ratio z-tests. Relationships between numerical variables were evaluated with Spearman's correlation. In order to determine the effective factors on the COMPASS-31 total score, multiple linear regression analysis was used. A value of $p<0.05$ was considered statistically significant.

RESULTS

This study was conducted on 42 patients with pSS and 42 healthy controls. The comprehensive clinical features of all of the subjects are presented in Table 1. The patient (44.6±7.5) and the control groups (43.8±9.7) were similar in terms of age (p=0.737) and BMI (p=0.053).

Those patients with pSS had a significantly higher mean total COMPASS-31 score than the controls (58.5 vs. 50.0; p=0.040). In sub-domain analysis, pSS patients exhibited significantly higher mean scores in the pupillomotor domain than the controls (13.5 vs. 9.0; p=0.002) (Table 2).

As shown in Table 3, 15 patients in the pSS group and 3 patients in the control group had MetS and this was statistically significant (p=0.023). The mean 10-year FRS was 6.0 in those patients with pSS and 2.0 in the controls, which was statistically significant (p=0.012). HAD depression scores (9.5 vs. 5.0; p=0.001) and HAD anxiety scores (11.3 vs. 6.7; p<0.001) were higher in those patients with pSS.

Table 1. Demographic and clinical characteristics of pSS patients and controls

	Healthy	pSS	p-value
Age	43.8±9.7	44.6±7.5	0.737†
BMI kg/m²	25.22±4.07	27.21±4.92	0.053†
Job, n (%)			
Housewife	2 (4.8)	34 (80.9)	<0.001‡
Worker	27 (95.2)	8 (19.1)	
Educational level, n (%)			
Middle school	0 (0.0)[a]	35 (80.9)[b]	
High school	15 (35.7)[a]	3 (9.6)[b]	<0.001‡
University	27 (64.3)[a]	4 (9.5)[b]	
Smoking status, n (%)			
Smoker	15 (35.7)	5 (11.9)	
Never smoked	25 (59.5)	31 (73.8)	0.051‡
Ex-smoker	2 (4.8)	6 (14.3)	
Disease duration, (months)	-	90.0 (110.0)	-
ESSDAI	-	2.0 (2.0)	-
ESSPRI	-	21.5 (10.0)	-

Numerical data are given as mean ± standard deviation or median (interquartile range) values, †: Independent samples t-test, ‡: Chi-square test, [a,b]: Superscripts indicate differences between groups in each rows. There was no statistically differences between groups with the same superscripts. BMI: Body mass index, ESSDAI: European League against Rheumatism Sjögren's Syndrome Disease Activity Index, ESSPRI: European League Against Rheumatism Sjögren's Syndrome Patient Reported Index, pSS: Primary Sjögren's syndrome.

Table 2. Comparison of COMPASS-31 scores by groups

	Groups		
	Healthy	pSS	p-value
Total score	50.0 (22.7)	58.5 (14.5)	**0.040&**
Orthostatic sub-score	4.0 (6.0)	7.0 (6.0)	0.918&
Vasomotor sub-score	2.0 (5.0)	4.0 (4.0)	0.316&
Secretomotor sub-score	8.0 (2.0)	9.0 (3.0)	0.624&
Gastrointestinal sub-score	20.0 (14.0)	22.0 (12.5)	0.165&
Bladder sub-score	3.0 (2.0)	3.0 (2.0)	0.621&
Pupillomotor sub-score	9.0 (7.5)	13.5 (4.0)	**0.002&**

Numerical data are given as median (interquartile range) values, Mann-Whitney U test. COMPASS-31: Composite Autonomic Symptom Score-31, pSS: Primary Sjögren's syndrome.

Table 3. Comparison of other variables according to groups

	Groups		
	Healthy	pSS	p-value
Framingham risk score	2.0 (7.5)	6.0 (5.7)	**0.012&**
HAD depression score	5.0 (3.5)	9.5 (5.7)	**0.001&**
HAD anxiety score	6.7±2.4	11.3±4.5	**<0.001†**
Waist circumference	79.2±8.2	90.1±11.7	**<0.001†**
Hip circumference	101.7±7.2	107.6±9.7	**0.012†**
Metabolic syndrome, n (%)	3 (7.1)	15 (35.7)	**0.023‡**

Numerical data are given as mean ± standard deviation or median (interquartile range) values, †: Independent samples t-test, &: Mann-Whitney U test, ‡: Chi-square test. pSS: pSS: Primary Sjögren's syndrome, HAD: Hospital anxiety and depression score.

According to Table 4, there was a relatively positive correlation between COMPASS-31 total scores and the FRS and the HAD depression scores in the pSS group. Vasomotor scores had a moderate positive correlation with the FRS and a weak positive correlation with HC. There was a moderate positive correlation between the gastrointestinal scores and the HAD depression scores. There was a moderate positive correlation between the bladder scores and the FRS. AD was not correlated with age, disease duration, smoking status, or disease activity.

According to Table 5, there was no significant correlation between AD as assessed with COMPASS-31 scores and job, education, or smoking status. The total scores and gastrointestinal scores of those with MetS were statistically higher than those of patients without MetS (p=0.049, p=0.009, respectively).

FRS, HAD depression scores and MetS variables with a p-value of <0.25 were included in the multiple linear regression model in comparisons with the COMPASS-31 total scores in Table 4, 5. The final model was reached using the backward elimination method. In the final model, the HADDEP variable was evaluated as effective on the COMPASS-31 total score [coefficient (95% confidence internal), 1.630 (0.601-2.659), adjusted r^2=0.262; p=0.003].

DISCUSSION

As far as we know, this was the first study in which AD was evaluated using COMPASS-31, comparing pSS individuals with healthy ones in the Turkish population, and also investigating its relationship with cardiovascular risk and disease activity. There are few studies investigating the relationships between pSS and AD in the literature.[6,21,22]

Table 4. Comparison of COMPASS-31 Scores with other numerical variables in patients with pSS

	COMPASS-31 (rho)						
	Total score	**Orthostatic**	**Vasomotor**	**Secretomotor**	**Gastrointestinal**	**Bladder**	**Pupillomotor**
Age	0.011	0.001	0.183	-0.084	0.219	-0.150	-0.085
BMI	-0.061	-0.198	0.080	-0.112	-0.147	0.189	-0.175
Disease duration	0.270	0.268	0.214	-0.148	0.142	0.042	0.113
Numeric rating scale	-0.022	0.126	0.171	-0.141	-0.089	-0.070	-0.034
ESSDAI	0.128	-0.094	0.099	-0.224	0.090	-0.150	0.232
ESSPRI	0.066	0.095	0.367	-0.261	0.042	-0.056	0.119
Framingham risk score	**0.535****	0.056	**0.460***	-0.173	0.355	**0.442***	0.227
HADS-D score	**0.465***	0.153	0.274	-0.156	**0.458***	0.149	0.341
HADS-A score	0.198	0.251	0.007	-0.331	0.303	0.216	0.275
Waist circumference	0.174	0.068	0.264	-0.336	-0.016	0.277	-0.104
Hip circumference	0.131	-0.049	**0.377***	-0.372	0.076	0.215	-0.175

rho: Spearman's rank correlation coefficient, *p<0.05; **p<0.01, BMI: Body mass index, ESSDAI: European League Against Rheumatism Sjögren's Syndrome Disease Activity Index, ESSPRI: European League Against Rheumatism Sjögren's Syndrome Patient Reported Index, HADS-D: Hospital depression score, HADS-A: Hospital anxiety score.

Table 5. Comparison of COMPASS-31 scores with categorical variables

	n	Total score	Orthostatic	Vasomotor	Secretomotor	Gastrointestinal	Bladder	Pupillomotor
Job								
Housewife	34	60.0 (14.0)	6.0 (6.0)	4.0 (4.0)	9.0 (3.0)	22.0 (13.0)	3.0 (1.0)	14.0 (5.0)
Worker	8	56.0 (17.0)	7.0 (5.0)	5.0 (3.5)	9.0 (2.0)	22.0 (10.5)	5.0 (2.0)	13.0 (1.5)
p*		0.727	0.215	>0.999	0.684	0.483	0.560	0.413
Education								
Middle school	35	61.0 (15.0)	6.0 (6.0)	2.0 (4.0)	9.0 (3.0)	22.0 (14.0)	3.0 (1.0)	14.0 (5.0)
High school + university	8	56.0 (13.0)	7.0 (4.0)	5.0 (2.0)	8.0 (3.0)	22.0 (7.0)	5.0 (1.5)	13.0 (1.5)
p*		0.908	0.483	0.521	0.264	>0.999	0.239	0.413
Smoking status								
Never smoked	31	61.0 (15.5)	6.0 (6.0)	2.0 (4.0)	9.0 (3.0)	20.0 (14.5)	3.0 (1.5)	14.0 (4.0)
Smoker or ex-smoker	11	56.0 (13.0)	7.0 (6.0)	5.0 (4.0)	9.0 (4.0)	22.0 (3.0)	4.0 (2.0)	13.0 (2.0)
p*		0.640	0.640	0.568	0.717	0.917	0.296	0.101
Metabolic syndrome								
No	27	54.5 (18.0)	4.0 (5.3)	2.0 (3.0)	9.0 (3.0)	19.0 (11.3)	3.5 (2.5)	14.0 (5.5)
Yes	15	63.0 (10.3)	7.5 (3.3)	5.5 (5.0)	7.5 (4.0)	26.0 (4.8)	3.0 (1.3)	13.0 (4.0)
p*		**0.049**	0.072	0.080	0.286	**0.009**	0.332	0.832

Numerical data are given as median (interquartile range) values, *: Mann-Whitney U test.

As a result of this study, it could be seen that those patients with pSS had significantly higher AD, cardiovascular risk, MetS, depression, and anxiety levels. The total COMPASS score was not correlated with disease activity. The FRS, and the HAD depression scores were independent predictors of COMPASS scores and AD.

When patients have pSS, clinicians are primarily interested in their clinical symptoms and inflammation levels. The evaluation parameters which are used are mostly based on symptoms such as dry mouth, dry eyes, and inflammation markers in the blood. However, in these patients, the increased frequency of AD symptoms and increased cardiovascular risks due to existing inflammations are at least as important as the disease itself. Since pSS is a chronic disease, these risks increase over the years. Therefore, as in all rheumatic diseases, it is important to investigate AD and CVS in pSS with a fast, easy, inexpensive, and non-invasive method in outpatient clinic conditions. Thus, high-risk patients can be quickly identified and referred with relevant diagnoses for treatment.

An association had been found between AD and pSS in previous studies.[6,23] The results of our study were similar to a previous study where patients with pSS had a significantly higher mean total COMPASS-31 score than the controls.[23] In a cohort study of Koreans, AD was higher in pSS and no correlation was found between AD and secretomotor function as was the case in our study.[24] Similarly, as in the previous study, there were significantly higher mean scores in the pupillomotor domain than in the controls.[22] It was difficult to say whether the eye-related findings in pSS are due to the disease itself or to AD. Therefore, in future studies, patients can be classified according to the severity of ocular and oral symptoms, and AD can also be investigated in these subgroups.

Parreau et al.[25] found a relationship between symptoms of the gastrointestinal system and ESSPRI, but not with ESSDAI. ESSPRI and ESSDAI do not include any questions about gastrointestinal symptoms in pSS. In COMPASS-31, there are questions to evaluate gastrointestinal system problems. In this study, unlike the previous study, GIS symptoms were not high and not correlated with disease activity.[24] However, the patients were not questioned regarding any medications used for their GIS symptoms. The GIS symptoms of the patients in the study group may have already been treated.

In this study, no significant correlation was found between AD and age, disease duration, smoking status, or disease activity. The total COMPASS score did not correlate with disease activity as assessed by ESSDAI or ESSPRI. Different results were obtained in studies investigating the relationships between disease activity and COMPASS scores. In a large study in the United Kingdom with 317 patients, the total COMPASS scores correlated with disease activity.[6] In another study with a limited number of patients, Stojanovich et al.[23] could not find a correlation with disease activity as our study did. The patient group was small in this study as was the case with Stojanovich et al.[23] Larger studies with larger patient groups may help to determine this relationship.

Since rheumatologic diseases are long-term, they affect patients' sleep patterns, social relationships, and quality of life. Therefore, the anxiety and depression levels of these patients may be affected. Since this study wanted to evaluate patients with pSS as a whole, we also wanted to investigate the anxiety and depression levels of these patients. In this study, multivariate analysis demonstrated that the HADS depression scores were key independent predictors of COMPASS-31 scores. Also, those patients with higher gastrointestinal COMPASS-31 subdomain scores positively correlated with the HADS depression scores. HADS anxiety scores were also higher in the study group. It suggests that AD may contribute to symptoms of depression and anxiety in pSS patients. A previous study showed there was a correlation between AD symptoms and anxiety levels.[21] However, this study evaluated depression and anxiety symptoms using HADS, and patients with pSS should be evaluated in more detail regarding their psychological state.

In this study, MetS is more common in pSS (35.7%) as was also seen in a previous study (MetS=39.4%).[26] In this study, the COMPASS-31 total score and the gastrointestinal subdomain were higher in those patients with MetS. Gezer et al.[27] also found a relationship between the COMPASS-31 secretomotor subdomain and MetS in another rheumatologic disease, psoriatic arthritis. This suggests that chronic inflammation plays a role in MetS. More detailed studies are needed in order to assess which pathophysiology is responsible.

Some prediction tools are available to detect cardiovascular risks in patients with pSS, for example, heart rate variability or cardiovascular reflex tests.[28,29] In 2021, the EULAR recommended the use of prediction tools such as FRS in pSS.[30] There is a correlation between AD and FRS and 10-year FRS positively correlated with the total COMPASS scores and also with the vasomotor and bladder subgroups in this study. Another study found that FRS was elevated independently of subclinical atherosclerosis.[31] Although patients with diabetes, severe CVD, stroke, kidney, and liver dysfunction which can affect the ANS were excluded, a positive association was found with AD and cardiovascular risk. If diabetic patients were included in this study, the prevalence of MetS, and the 10-year FRS would probably have been higher. This is so important because, in daily practice during the routine examination of patients with pSS, CVD and ADs can be ignored. However, COMPASS-31, a simple validated questionnaire, may indicate risks for CVD and patients can be referred to the relevant specialists. In addition, early detection of cardiovascular involvement helps initiate appropriate treatment. It also helps to prevent the severe consequences of ANS dysfunctions, such as sudden clinical death or arrhythmias. Davies and Ng[32] suggested that there is an interaction between the ANS and the immune system, and because of this interaction, new treatments for ANS are promising in rheumatic diseases.

Study Limitations

This study had a limited number of patients and only women were included. DM and severe CVD were excluded due to their direct effect on ANS. However, many factors can affect ANS, such as hypertension, hyperlipidemia, or many drugs. This study evaluated AD with a questionnaire, while a reflex test or heart rate variability were not used.

CONCLUSION

In this study, patients with pSS had significantly higher levels of AD, cardiovascular risk, MetS, depression, and anxiety levels. The COMPASS-31 questionnaire showed a relationship between AD, cardiovascular risk, and also HAD depression symptom levels. No correlation between disease activity and the COMPASS-31 score was observed.

MAIN POINTS

- Autonomic dysfunction (AD) and cardiovascular disease risk are higher in those patients with primary Sjögren syndrome.

- COMPASS-31 is a simple validated questionnaire which may indicate risks for AD in patients with pSS.
- Early diagnosis of AD helps to prevent the severe consequences of ANS and helps to initiate the appropriate treatment.

ETHICS

Ethics Committee Approval: This cross-sectional study was carried out with the permission of the Hitit University Çorum Erol Olçok Training and Research Hospital Ethics Committee (approval number: 2023-128, date: 01.11.2023).

Informed Consent: It was obtained.

DISCLOSURES

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