POS0551

MEDICAL COSTS FOR PATIENTS STARTING TREATMENT FOR RHEUMATOID ARTHRITIS WHO HAVE COMORBID DIABETES MELLITUS IN JAPAN

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Background: Rheumatoid arthritis (RA) patients can experience various comorbidities¹. The incidence of diabetes mellitus (DM) is reported higher in patients with RA² and comorbid DM is likely to affect treatment outcomes³ and then healthcare resource uses, however, no previous study has not focused on it.

Objectives: To evaluate medical costs and resource use in patients starting treatment for RA with and without DM using a large claims database in Japan.

Methods: We used a large Japanese administrative claims database constructed by the Japan Medical Data Center (JMDC)⁴. Patients with the International Classification of Diseases 10th revision (ICD-10) codes for RA who started medication with disease-modifying antirheumatic drugs (DMARDs) after 6 months without them in the period from 1/1/2012 to 12/31/2017 and who were observable for 12 months as a follow-up period were enrolled. These patients were categorized as DM or non-DM group with ICD-10 codes for DM plus use of antidiabetic drugs in 6 months before starting DMARDs (baseline period). To adjust baseline characteristics between the 2 groups, they were matched by sex, age, Charlson Comorbidity Index (CCI) except for DM, months from the first RA codes to starting DMARDs, and medications. The primary endpoint was mean medical cost per patient in the 12-month follow-up period. Costs in JPY were converted into EUR (1 EUR = 125 JPY in 2020). Costs for drugs, treatments, and materials and their subcategories were evaluated both with and without DM-specific costs. The secondary endpoints were the proportions of patients using the subcategories of each resource.

Results: Patients of 161 for the DM group and 2,974 for the non-DM group were eligible, and 109 patients were matched from each group. The medians of age and CCI were 59 years and 2.0 in both groups and no significant difference was observed in all baseline characteristics used for matching between the groups. Total mean costs were significantly higher in the DM group (DM, 5,331 EUR, non-DM 3,200 EUR; $P < 0.05$). After excluding DM-specific costs, drug costs were significantly higher in the DM group than in the non-DM group (DM 1,883 EUR, non-DM 896 EUR; $P < 0.05$), especially costs for biological DMARDs (DM 1,156 EUR, non-DM 292 EUR; $P < 0.05$), mainly because a higher proportion of patients used these drugs in the DM group (Table 1). Treatment costs (DM 2,380 EUR, non-DM 2,133 EUR) and material costs (DM 74 EUR, non-DM 149 EUR) were not different between the groups, but only costs for examinations were significantly higher in the DM group (DM 970 EUR, non-DM 779 EUR; $P < 0.05$).

Table 1. Number and proportion of patients who used drugs

Type of drug	Drug use, n (%)			
		DM (N = 109)	Non-DM (N = 109)	P-value
csDMARDs	Total	109 (100.0)	109 (100.0)	1.000
	Methotrexate	101 (92.7)	102 (93.6)	1.000
	Others	46 (42.2)	51 (46.8)	0.583
bDMARDs	Total	16 (14.7)	6 (5.5)	0.041
	TNFi	11 (10.1)	4 (3.7)	0.118
	IL6i	6 (5.5)	2 (1.8)	0.219
	T-cell	4 (3.7)	0 (0.0)	0.125
tsDMARDs		0 (0.0)	0 (0.0)	1.000
CSs		65 (59.6)	62 (56.9)	0.711
Analgesics	Total	103 (94.5)	96 (88.1)	0.167
	Acetaminophen	24 (22.0)	23 (21.1)	1.000
	Acetaminophen /Opioids	10 (9.2)	6 (5.5)	0.454
	NSAIDs	102 (93.6)	93 (85.3)	0.093
	Opioids	0 (0.0)	4 (3.7)	0.125
	Others	25 (22.9)	17 (15.6)	0.185

bDMARDs=biological disease-modifying antirheumatic drugs; CSs=corticosteroids; csDMARDs=conventional synthetic disease-modifying antirheumatic drugs; DM=diabetes mellitus; IL6i=interleukin-6 inhibitor; NSAID=non-steroidal anti-inflammatory drug; T-cell=selective T-cell co-stimulation modulator; TNFi=tumor necrosis factor α inhibitor; tsDMARDs=targeted synthetic disease-modifying antirheumatic drugs; P-values were calculated using McNemar test

Conclusion: Medical costs for RA were higher in the DM group than in the non-DM group because of more prevalent use of biological DMARDs in the DM group.

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POS0552

DIASTOLIC DYSFUNCTION ASSOCIATED WITH INCREASED ACTIVITY IN RHEUMATOID ARTHRITIS

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Background: Cardiovascular disease (CVD) is the main cause of mortality in patients with rheumatoid arthritis (RA) reflected by a higher prevalence of cardiovascular risk factors (CVRFs), a chronic systemic inflammatory state and heart failure compared to the general population (1). Left ventricular diastolic dysfunction (LVDD) is attributable to structural abnormalities such as hypertrophy or interstitial fibrosis and impaired myocyte relaxation resulting from ischemia and is frequently asymptomatic (2). The presence of LVDD it could be considered as the first step to development of heart failure.

Objectives: The aim of the study is to identify the association of disease activity and the presence of LVDD in patients with RA.

Methods: A cross-sectional, observational, and comparative study of RA subjects that fulfilled ACR / EULAR 2010 classification criteria, aged 40-75 years. Subjects were evaluated by a transthoracic echocardiogram performed and reviewed by two certified echocardiographers. A total of fifty-one RA patients diagnosed with LVDD were included according to the 2016 American Society of Echocardiography (ASE). Distribution was evaluated with the Kolmogorov-Smirnov test. Descriptive analysis was done using measures of central tendency. Chi square, Student's t test and Mann-Whitney U test were used for comparisons between groups. A p value <0.05 was considered statistically significant.

Results: We found no statistical difference between groups regarding age, gender, comorbidities (type 2 diabetes mellitus, hypertension, dyslipidemia and, active smoking) and body mass index. Patients with LVDD demonstrated a higher disease activity evaluated by disease activity score using 28 joints-C reactive protein (DAS28-PCR) (4.88 vs 3.56, $p = 0.004$) (Table 1). It was observed that patients with LVDD have a higher prevalence of being in the high disease activity category (41.2% vs. 13.7%, $p = 0.002$) (Figure 1). When performing a binary logistic regression, it was found that a high disease activity was the only independent predictor for the presence of LVDD, with an OR 4.70, (95% CI 1.63-13.50, $p = 0.004$).

Table 1. Demographic and disease characteristics

	RA patients with LVDD (n=51)	RA patients without LVDD (n=51)	p
Women, n (%)	50 (98)	47 (92.2)	NS
Age, years $\pm$ SD	56.12 $\pm$ 8.76	53.91 $\pm$ 5.61	NS
HTN, n (%)	17 (33.3)	13 (25.5)	NS
T2DM, n (%)	6 (11.8)	10 (19.6)	NS
Dyslipidemia, n (%)	17 (33.3)	11 (21.6)	NS
Active smoking, n (%)	5 (9.8)	5 (9.8)	NS
BMI kg/m ² $\pm$ SD	28.20 $\pm$ 4.89	29.40 $\pm$ 5.13	NS
Disease duration, years (p25-p75)	10.70 (5.16-17.87)	5.66 (2.67-15.64)	0.033
DAS28-CRP, median (p25-p75)	4.88 (3.53-5.45)	3.56 (3.00-4.69)	0.004

NS, no significant; HTN, hypertension; T2DM, type 2 diabetes mellitus; BMI, body mass index; DAS28, disease activity score using 28 joints; CPR, C reactive protein

Conclusion: Patients with RA and LVDD have a higher disease activity, so emphasis should be placed on strict antirheumatic treatment and cardiovascular therapies to avoid the risk of developing CVD and the progression to heart failure. Logistic regression demonstrates that inadequate disease control is an independent factor from traditional CVRFs for the presence of LVDD.

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Figure 1. Classification of disease activity by DAS28-CRP

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IMPACT OF RHEUMATOID ARTHRITIS ON LEFT VENTRICULAR REMODELING

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Background: Patients with Rheumatoid Arthritis (RA) have a higher prevalence of cardiovascular diseases (1) and a strong association with abnormalities in the left ventricle (LV) geometry. Both concentric and eccentric remodeling have been determined as an independent factor for sudden cardiac arrest in the general population with normal or slightly decreased ventricular function (2) but there is still controversy about the factors involved and the pathophysiology in patients with RA.

Objectives: The aim of the study is to determine the characteristics of LV geometry and the impact of RA.

Methods: A cross-sectional, observational, and comparative study of fifty-two RA patients that fulfilled ACR / EULAR 2010 classification criteria, aged 40-75 years. Controls were included and matched by age, gender, and comorbidities. Subjects were evaluated using a transthoracic echocardiogram performed and reviewed by two certified echocardiographers. Ventricular geometry was evaluated with indexed left ventricular mass and relative wall thickness. Distribution was evaluated with the Kolmogorov-Smirnov test. Descriptive analysis was done using measures of central tendency. Chi square, Student's t test and Mann-Whitney U test were used for comparisons between groups. A logistic binary regression was performed with the traditional cardiovascular risk factors (CVRFs), age and RA diagnosis. A *p* value <0.05 was considered statistically significant.

Results: No significant differences were found in the traditional CVRFs (type 2 diabetes mellitus, dyslipidemia, active smoking, and hypertension) (Table 1). Most of the subjects reported normal geometry in both groups (55.8% for RA group vs 64.0% for controls). A higher prevalence of eccentric hypertrophy was found in the RA group, 13 (25%) subjects versus 3 (6%) in the control group, *p* = 0.009. The binary regression showed that the diagnosis of RA was the only independent risk factor for the presence of eccentric hypertrophy, OR 7.22 95% CI (1.68-31.02, *p* = 0.008).

Table 1. Demographic characteristics and echocardiographic findings.

	RA (n=52)	Control (n=50)	<i>p</i>
Age, years ± DE	51.4 ± 6.2	51.1 ± 5.5	NS
Women, n (%)	51 (98.1)	49 (98.0)	NS
Active smoking, n (%)	8 (15.4)	8 (16.0)	NS
Dyslipidemia, n (%)	11 (21.2)	13 (26.0)	NS
Type 2 Diabetes Mellitus, n (%)	5 (9.6)	5 (10.0)	NS
HTN, n (%)	8 (15.4)	10 (20.0)	NS
BMI kg/m ² , median (p25-p75)	27.8 (24.5-31.4)	28.3 (25.4-30.3)	NS
BSA, median (p25-p75)	1.7 (1.6-1.8)	1.8 (1.6-1.9)	0.003
Systolic blood pressure, mmHg (p25-p75)	119.5 (110.0-127.5)	120.0 (110.7-130.0)	NS
Echocardiography findings			
LVPWTd, median (p25-p75)	0.9 (0.8-1.0)	0.9 (0.8-1.0)	NS
LVIDd, median (p25-p75)	4.8 (4.3-5.2)	4.6 (4.5-4.9)	NS
LV mass, median (p25-p75)	131.2 (119.5-155.7)	131.2 (113.2-154.3)	NS
LV mass index, median (p25-p75)	78.6 (69.7-95.6)	76.0 (66.7-84.6)	NS
RWT, mean ± SD	0.4 ± 0.09	0.4 ± 0.07	NS

NS, no significant; BMI, body mass index; BSA, body surface area; LVPWTd, left ventricular posterior wall thickness at end-diastole; LVIDd, left ventricular internal dimension at end-diastole; RWT, relative wall thickness.

Conclusion: There is a higher prevalence of eccentric remodeling in patients with RA independently of traditional CVRF. The diagnosis of RA is an independent risk factor for the presence of eccentric hypertrophy that is associated with higher mortality. Treatment of cardiovascular comorbidities should be intensified in those patients with abnormalities in LV geometry in order to prevent cardiovascular diseases such as heart failure.

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Figure 1. Abnormalities in left ventricular geometry in patients with RA.

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POS0554

MEDICAL COST AND RESOURCE USE IN PATIENTS STARTING TREATMENT FOR RHEUMATOID ARTHRITIS TREATED WITH AND WITHOUT CORTICOSTEROIDS IN JAPAN

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Background: The 2019 update of the European League Against Rheumatism (EULAR) treatment recommendations strongly recommends co-administration of corticosteroids (CSs) with conventional synthetic disease-modifying antirheumatic drugs (csDMARDs) in patients with RA as bridging therapy to improve the success rate of the first-line treatment and to avoid disease flare-ups¹; however, current treatment guidelines for RA in Japan do not clearly mention about their use. Poor disease management after the initial diagnosis can affect the overall use of health services and the economic burden on patients.

Objectives: To describe medical costs and resource use in patients with early RA treated with and without oral or injectable corticosteroids (CSs) as part of their initial treatment with disease-modifying antirheumatic drugs (DMARDs) in Japan.