**AB0548**

**ASSESSMENT OF THE PHYSICAL ACTIVITY IN SYSTEMIC SCLEROSIS PATIENTS BY USING COMMERCIAL SMART BANDS AND ITS ASSOCIATION WITH DISEASE CHARACTERISTICS: A PILOT STUDY**

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**Background:** Systemic sclerosis (SSc) is a complex disease, characterized by multi-system organ involvement including interstitial lung disease (ILD) and pulmonary arterial hypertension (PAH). The decrease in physical activity in SSc patients with lung involvement has been demonstrated by self-reported physical capacity and 6 min-walking test (6MWT) (1, 2). Commercial smart bands can provide data on daily physical activity, sleep characteristics, blood oxygen concentration and heart rate measurement, therefore may aid in monitoring disease activity.

**Objectives:** The aim of this study is to evaluate physical activity in SSc patients by using a commercial smart band and investigate its association with clinical characteristics and patient-reported outcome measures of disease activity

**Methods:** This prospective observational study included SSc patients with a smartphone. Patients characteristics including age, sex, and organ involvements were recorded. Each participant was subjected to pulmonary function tests and 6MWT. All of patients answered Scleroderma Health Assessment Questionnaire (SHAQ), consisting of HAQ-Disability Index (DI) and visual analog scales (VAS) domains. All patients received Fitbit inspire HR smart band which records the number of steps, heart rate, distance and was instructed to wear it continuously for one week. Tracked data was collected from smartphones via Fitbit application.

**Results:** Fifteen SSc patients (14 females and 1 male) participated in the study. In the study age was 48.5±15.5 and the median disease duration was 4 (min-max: 1-9) years. Eleven (73.3%) patients had ILD and one patient had PAH. Musculoskeletal complaints were evident in two patients. Forced vital capacity (FVC, % predicted), diffusion capacity of lung for carbon monoxide (DLCO, %) in patients with ILD were significantly lower than patients without ILD median (IQR) 102 (30) vs 80 (27) p= 0.026, 57 (20) vs 95 (13), p= 0.002, respectively. The median distance of 6MWT were 450 (225) vs 568 (102) in ILD and non-ILD groups.

The median weekly step counts of ILD patients were remarkably lower in ILD patients compared to non-ILD 36.137 (17.879) vs 58.114 (80.681) steps/week, (p= 0.01). Patients with ILD had a bit higher median heart rate compared to non-ILD 73 (9) vs 67.5 (12). The total weekly step counts were correlated with pulmonary function tests, including forced expiratory volume in one second (FEV1%) (r= 0.57, p= 0.025), FVC (%) (r= 0.65, p= 0.009), and DLCO (%) (r= 0.70, p= 0.003), patient-reported disease severity (r= 0.66, p= 0.007), and breathing problem (r= -0.55, p= 0.03) domains of SHAQ. There was no correlation between weekly step counts and 6MWT

**Conclusion:** The assessment of physical activity with smart activity bands may help to identify SSc patients with ILD. Tracked physical activity using smart bands correlates with pulmonary function tests and performs better than 6MWT, suggesting it as a useful tool for the assessment of disease activity.

**References:**


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**AB0550**

**DIFFUSING CAPACITY OF THE LUNG FOR CARBON MONOXIDE (DLCO) VS FORCED VITAL CAPACITY (FVC): SYSTEMATIC LITERATURE REVIEW AND META-ANALYSIS TO EXAMINE THEIR ABILITY TO MEASURE CHANGE IN CLINICAL TRIALS IN SYSTEMIC SCLEROSIS (SSC)**

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**Background:** Lung involvement remains the main cause of morbidity and mortality in SSc. In 1 year clinical trials to assess lung involvement, FVC is usually evaluated and changes while the DLCO usually remains unchanged. In longer term observational studies, the DLCO often changes more than the FVC.

**Objectives:** To examine, through a systematic literature review (SLR) and meta-analysis, whether DLCO%pred or FVC%pred (both designed to be normalized solely as DLCO and FVC henceforth), responds more in assessing SSC interstitial lung disease in first year and longer term follow-up (FU).

**Table 1. Results from Random Effect Meta-Analysis**

<table>
<thead>
<tr>
<th>21 studies</th>
<th>5 studies</th>
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<tbody>
<tr>
<td>FVC % pred</td>
<td>DLCO % pred</td>
</tr>
<tr>
<td>mean value</td>
<td>mean value</td>
</tr>
<tr>
<td>78.8</td>
<td>3.43</td>
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<tr>
<td>59.7</td>
<td>5.52</td>
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<tr>
<td>81.1</td>
<td>5.68</td>
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<tr>
<td>55.6</td>
<td>11.59</td>
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<tr>
<td>1 YEAR FOLLOW UP</td>
<td>81.5</td>
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<tr>
<td>&gt;1 YEAR FOLLOW UP</td>
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</table>

**Methods:** We reviewed 374 records of SSc patients at our site EUSTAR cohort and extracted cases with reported AS confirmed by ECHO cardiography and heart catheterization.

**Results:** We found data on 13 (3.4%) patients with AS: 12 females (92.3%); mean age 70.3 (SD 7.7) years, disease duration 15.4 (SD 6.3) years. Ten patients had limited SSc (76.9%), all cared anti-centromere antibodies and 3 diffuse SSc (1 patient had RNP3 and 2 had anti-topoisomerase antibodies); 5 (38.5%) patients had significant coronary disease (3 underwent CABG, 2 had several PTCA). Eight (61.5%) patients died during years 2004 - 2019. Aortic valve replacement was performed in 5 patients (4 – metal and 1 – biological); 2 patients did not undergo AS repair due to impaired general condition; 6 patients underwent TAVI between January 2013 and December 2015 (at Rambam Cardiology Institute). All SSc patients underwent trans femoral TAVI under conscious sedation. The procedure was successful in all patients. The length of hospitalization was 5-14 days (mean 8.2 days); 3 (50%) patients needed pacemaker implantation (they did not have previous conduction abnormalities). The follow-up duration after TAVI was between 5 and 67 months (mean 20.7). During follow-up one patient developed bacterial endocarditis related to pacemaker device two months after the procedure; the event resolved after removing the device and according antibiotics treatment; the same patient had transient ischemic attack two years later and another pacemaker implantation 3 years later due to complete AV block. One patient died from urosepsis 11 months after TAVI, the death was not related to procedure. One patient developed anemia due to large hematoma after the procedure.

**Conclusion:** Screening for aortic valve pathology is essential as AS is not rare in SSc patients especially in those with long standing limited disease and positivity to centromere antibodies. AS in SSc patients may be associated with clinically significant coronary artery disease. TAVI was safe in our SSc patients without in-hospital mortality and benign long-term outcome.

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