Validation of a New Outcome Measure for Sacroiliac Joint Pain – The Denver SI Joint Questionnaire (DSIJQ)

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Background

- The prevalence of sacroiliac joint (SIJ) pain ranges from 15-30% in patients with chronic LBP[1]
- The Oswestry Disability Index (ODI) is a commonly used outcome measure for SIJ pain[2]
- The ODI has been validated for patients with chronic LBP, but not for patients with SIJ pain
- Functional disability from SIJ pain is likely different from those resulting from chronic LBP
- There is a need for a valid and reliable SIJ specific functional outcome measure

Purpose

The purpose of this study was to develop and validate a questionnaire focused on common impairments and functional limitations of patients with SIJ pain.

Participants

Subjects with a diagnosed SIJ disorder were prospectively recruited from the UCHealth Spine Clinics

Inclusion criteria:

1) Pain in the region of the posterior superior iliac spine (PSIS) with or without radiation into buttocks, posterior thigh or groin
2) Positive SIJ provocation tests
3) ≥ 50% improvement in pain on Numeric Pain Rating Scale (NPRS) following injection of local anesthetic (with/without steroids) into the affected SIJ(s).

Exclusion criteria:

1) Pregnancy
2) Back pain due to other causes (disc degeneration or herniation, spondylolisthesis, spinal stenosis, facet degeneration, or vertebral fracture)
3) Recent SIJ treatment that successfully improved the patient's pain
4) Other diagnosed chronic comorbid conditions contraindicating physical capability measures (e.g. severe hip/knee osteoarthritis, cardiac disease, pulmonary disease, fibromyalgia)

- 24 participants
- Age: 48.6 ± 15.8 years
- 18/24 (75%) were female

Methods

- Multidisciplinary team of physicians and rehabilitation professionals developed a 10-item questionnaire (DSIJQ) (see Figure 1)
- Subjects completed DSIJQ and ODI at baseline, 2 weeks and 5-8 months; SF-36 administered at baseline and 5-8 months. Global rating of change (GRC) completed at baseline and 5-8 months
- Subjects underwent *physical capability testing* at 2-weeks and 5-8 months, including lumbar inclinometry, Timed Up and Go (TUG), single leg stance, 5 minute walk (5MW), active straight leg raise (SLR), sustained flexion and extension, progressive isoinertial lift test, and maximum static push/pull tests.[3-9]
- Validation analyses included test-retest reliability, internal consistency, content validity, convergent criterion validity, divergent criterion validity, and responsiveness.

Figure 1. Denver SI Joint Questionnaire

Sitting:
- □ I can sit normally in any chair for any length of time.
- □ I can sit normally in a padded/cushioned chair for any length of time.
- □ I can sit for any length of time, but I have to shift positions frequently because of my SI joint pain.
- □ My SI joint pain prevents me from sitting for more than 1 hour.
- □ My SI joint pain prevents me from sitting for more than 10 minutes.
- □ I cannot sit because of my SI joint pain.

Getting up from a chair:
- □ I have no SI joint pain and can get up from a chair normally.
- □ I have some SI joint pain but can get up normally.
- □ I have some SI joint pain and have to get up very slowly and ease myself out of the chair.
- □ I have severe SI joint pain and have to get up very slowly and ease myself out of the chair.
- □ I cannot get up from a chair without assistance because of my SI joint pain.
- □ N/A: I cannot sit because of my SI joint pain.

Walking:
- □ I can walk any distance on any surface.
- □ My SI joint pain keeps me from walking on uneven surfaces.
- □ My SI joint pain keeps me from walking more than 1 mile.
- □ My SI joint pain keeps me from walking more than 100 yards.
- □ My SI joint pain forces me to use a stick or crutches.
- □ I cannot walk because of my SI joint pain.

Walking up or down stairs:
- □ I can go up and/or down stairs normally without SI joint pain.
- □ I can go up and/or down stairs normally, but I have some SI joint pain.
- □ I have to go up and/or down stairs slowly because of my SI joint pain.
- □ I have to rely on the hand rail for support because of my SI joint pain.
- □ My SI joint pain forces me to take one stair at a time, using only one leg to go up or down.
- □ I cannot walk up or down stairs because of my SI joint pain.

Getting in and out of a car:
- □ I have no SI joint pain and can get in and/or out of a car normally.
- □ I have mild SI joint pain, but can get in and/or out of a car normally.
- □ I have moderate SI joint pain, but can get in and/or out of a car normally.
- □ I have severe SI joint pain, but can get in and/or out of a car normally.
- □ I have severe SI joint pain, and can only get in and/or out of a car with assistance.
- □ I cannot get in and/or out of a car because of my SI joint pain.

Bending at the waist, kneeling, or squatting:
- □ I can bend at the waist, kneel, and/or squat without SI joint pain.
- □ I have mild SI joint pain when I bend at the waist, kneel, and/or squat.
- □ I have moderate SI joint pain when I bend at the waist, kneel, and/or squat.
- □ I have severe SI joint pain when I bend at the waist, kneel, and/or squat.
- □ I have severe SI joint pain and need assistance to bend at the waist, kneel, and/or squat.
- □ I cannot bend at the waist, kneel, and/or squat because of my SI joint pain.

Lifting:
- □ I can lift heavy weights without SI joint pain.
- □ I can lift heavy weights, but it gives me SI joint pain.
- □ My SI joint pain keeps me from lifting heavy weights off the floor, but I can lift heavy weights if they are positioned at waist height (i.e. on a table).
- □ My SI joint pain keeps me from lifting heavy weights, but I can lift light to medium weights if they are positioned at waist height (i.e. on a table).
- □ I can only lift very light weights because of my SI joint pain.
- □ I cannot lift or carry anything at all because of my SI joint pain.

Work, Recreation, Social Life, Sex Life, or Family/Home Activities:
- □ I can complete activities that are personally important to me Life, Sex Life, or Family/ without SI joint pain.
- □ I can complete activities that are personally important to me, but I have mild SI joint pain.
- □ I can complete activities that are personally important to me, but I have moderate SI joint pain.
- □ I can complete activities that are personally important to me, but I have severe SI joint pain.
- □ My SI joint pain prevents me from completing many activities that are personally important to me.
- □ My SI joint pain prevents me from completing most/all activities that are personally important to me.

Sleep:
- □ My sleep is never disrupted by SI joint pain.
- □ My sleep is only occasionally disrupted by my SI joint pain.
- □ My sleep is disrupted by SI joint pain, but I am able to sleep around 8 hours a night.
- □ I sleep less than 6 hours a night because of my SI joint pain.
- □ I sleep less than 4 hours a night because of my SI joint pain.
- □ I barely sleep at all because of my SI joint pain.

SI Joint Stability:
- □ My SI joint never feels unstable or "out of place."
- □ My SI joint only feels unstable or "out of place" with vigorous, stressful activities.
- □ My SI joint feels unstable or "out of place" with bending and twisting.
- □ My SI joint feels unstable or "out of place" with standing and walking.
- □ My SI joint often feels unstable or "out of place," regardless of activity.
- □ My SI joint always feels unstable or "out of place," regardless of activity.

Scored 0-5 for each question. Total score is calculated as (total scored/50) X 100%. Scores range from 0-100% with higher scores representing more disability

Results

- The DSIJQ demonstrated good test-retest reliability (ICC=0.87), internal consistency (Cronbach's alpha=0.84), and content validity (<30% floor/ceiling effects)
- Convergent criterion validity was established through DSIJQ and ODI correlation (r=0.89; p < 0.001); divergent criterion validity was demonstrated by lack of correlation with mental health component of the SF-36 (r=-0.33; p=0.12)
- DSIJQ correlated with 2 performance measures: TUG (r = 0.53; p= 0.008), and 5MW (r = -0.52; p=0.009)
- DSIJQ demonstrated better responsiveness than the ODI in standardized response mean and effect size (1.14, 1.45 for DSIJQ and 0.75, 0.81 for ODI, respectively)
- Minimally Clinical Important Difference (MCID) of the DSIJQ based on GROC was 19 points

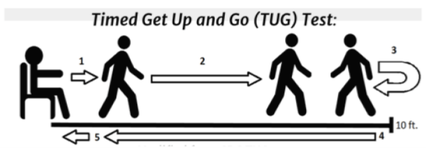
Table 1: Responsiveness Indices, Means (M) and Standard Deviations (SD) for the DSIJQ and ODI

	T1 M(SD)	T3 M(SD)	Change Scores Scores M(SD)	SRM	ES
DSIJQ	52.8 (14.0)	32.5 (22.7)	20.3 (17.8)	1.14	1.45
ODI	47.3 (15.4)	34.6 (18.6)	11.6 (14.4)	0.75	0.81

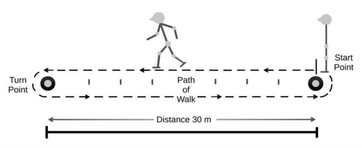
T1: Time 1 (baseline), T2: Time 2 (within 2 weeks after baseline), SRM: Standardized response mean, ES: Effect size

Figure 2. Correlated Physical Capability Tests

Timed Up and Go



5 Minute Walk Test



Conclusions

- DSIJQ appears to be a valid, reliable tool to measure SIJ disability and detect changes in disability after targeted SI joint treatment.
- DSIJQ scores were significantly correlated with 2 tests of physical functioning (TUG, 5 min walk), which adds face validity.
- The DSIJQ was more sensitive to changes in SIJ disability over a 5-8 month time period than the ODI.
- The absence of floor and ceiling effects indicated the DSIJQ was able to discern different levels of SIJ disability from severe to mild.
- Higher Standard Response Means and Effect Sizes than the ODI indicated better responsiveness of the DSIJQ in this population.

Clinical Relevance

- The DSIJQ is simple to administer and score, and includes domains intentionally focused on activities of daily life impacted by SIJ pain
- The DSIJQ is reliable and more responsive and sensitive to changes in SIJ disability than the ODI
- The DSIJQ was correlated with 2 physical capability tests (TUG, 5MW) that are associated with problematic movements for individuals with SIJ pain.[7-9]
- The DSIJQ appears to be a valid, reliable tool to evaluate SIJ disability and detect changes in disability after targeted SI joint treatment

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Funding: