Corticosteroid Injections and Mid-Term Outcomes in Type 2 Diabetes Mellitus Patients with Adhesive Capsulitis

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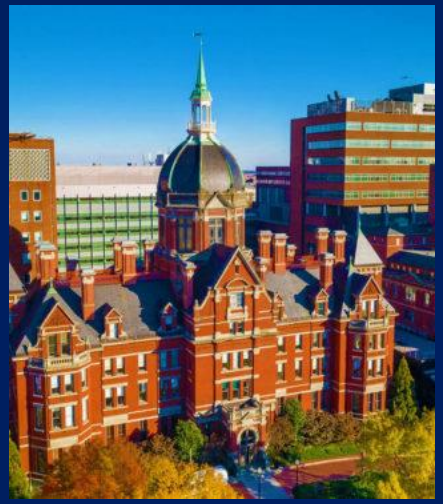

Disclosures

- Dr. Weber:
  - Paid Consultant for ProPharma, NDA Partners
  - Editorial or Governing board of Archives of Orthopaedic And Trauma Surgery, Arthroscopy, Journal of Shoulder and Elbow Surgery, SLACK Incorporated
  - Board of Directors member for AAOS, Arthroscopy Association of North America, International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine
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- Dr. McFarland
  - Disclosures are available at the AAOS website.

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Introduction

- Adhesive capsulitis (AC), or frozen shoulder, is a painful condition limiting shoulder range of motion (ROM), affecting 2-5% of individuals.[1,2,3]

- AC is classified as primary (idiopathic) or secondary, with secondary cases linked to conditions like rotator cuff pathology and diabetes mellitus (T2DM).[4]

Introduction

- T2DM is a known risk factor for AC, associated with worse outcomes due to hyperglycemia-induced inflammation and fibrosis.[5,6]

- Corticosteroid injections are a common nonoperative treatment but may have adverse effects in T2DM patients, including transient hyperglycemia and impaired healing.[7,8]

- The mid-term effects (6-12 months) of corticosteroid injections in T2DM patients with AC remain unclear.

Objective

- Evaluate the 6-12 month outcomes of corticosteroid injections in T2DM patients with AC, focusing on pain recurrence, reinjection rates, and surgical intervention rates.

Materials and Methods

- **Study Design:** Retrospective cohort study using the TriNetX Research Network, a global database of over 130 million electronic health records.

- **Inclusion Criteria:** Patients with T2DM (ICD-10: E11) and a first-time diagnosis of AC (M75.00, M75.01, M75.02).

Materials and Methods

- Cohorts:
  - **Injection Cohort:** Patients receiving intra-articular corticosteroid injections within six months of diagnosis (ICD-10: 20610, 20611; HCPCS: J1885, J3301, J1030).
  - **Non-Injection Cohort:** Patients diagnosed with AC but did not receive corticosteroid injections.

Materials and Methods

- **Statistical Analysis:**
  - Propensity score matching (1:1) to control for demographics and comorbidities.
  - Outcomes analyzed from 6 months to 1 year post-diagnosis.
  - Statistical tests: Student’s t-test (continuous variables), chi-square test (categorical variables).

Results

- **Cohort Size:** 59,054 total patients (Injection: 3,820; No Injection: 55,234); after matching, 3,819 per cohort.

- **Demographics (After Matching):** No significant differences in age, gender, race, or comorbidities between cohorts.

Table 1: Follow-up metrics and outcomes of T2DM patients with and without injection within six months of first-time adhesive capsulitis diagnosis

After Matching							
	Injection (n=3,819)		No Injection (n=3,819)				
Variable	Number	Percent/SD	Number	Percent/SD	P-Value	Risk Ratio	95% CI
Follow-Up Time (days)	323.6	94.8	314.6	106.1	<0.0001	NA	NA
Pain in joint*	40	11.1%	43	4.7%	<0.0001	2.4	1.6-3.6
Arthrocentesis, aspiration, and/or injection	454	11.9%	191	5.0%	<0.0001	2.4	2.0-2.8
Shoulder arthroscopy	73	1.9%	34	0.9%	0.0001	2.2	1.4-3.2
Infection following a procedure	≤10	0.3%	≤10	0.3%	1.0000	1.0	0.4-2.4
Stiffness of shoulder	72	1.9%	57	1.5%	0.1829	1.3	0.9-1.8
Strain of shoulder rotator cuff	39	1.0%	29	0.8%	0.2232	1.3	0.8-2.2
Shoulder contusion	≤10	0.3%	≤10	0.3%	1.0000	1.0	0.4-2.4
Unspecified mononeuropathy of upper limb	≤10	0.3%	≤10	0.3%	1.0000	1.0	0.4-2.4
Manipulation of shoulder joint under anesthesia	≤10	0.3%	≤10	0.3%	1.0000	1.0	0.42-2.4

*After matching, the cohort sizes differed, with 361 patients in the Injection Cohort and 919 patients in the No Injection Cohort

Discussion/Conclusion

- T2DM patients who received corticosteroid injections had higher rates of pain recurrence, reinjections, and surgical interventions compared to those who did not.

- Findings align with prior research showing that T2DM patients have poorer outcomes following corticosteroid injections in other musculoskeletal conditions.

Discussion/Conclusion

- Other potential explanations:
  - Corticosteroid-induced hyperglycemia may impair tissue healing.
  - Injection may provide temporary relief but not address underlying fibrosis.
  - Patients in the injection cohort may have had more severe A1C at baseline.

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