A Retrospective Study Evaluating Risks Associated with Musculoskeletal Corticosteroid Injections in Patients with Diabetes

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Introduction

Musculoskeletal (MSK) corticosteroid injections (CSIs) are commonly used to decrease pain and inflammation and improve mobility and function[1]. Despite local administration, studies have shown intraarticular CSI to be absorbed into circulation[2,3] and cause systemic effects lasting days to weeks[4,5]. One concerning systemic effect is transient hyperglycemia, as corticosteroids are known to have many metabolic effects[6-8]. Prior studies have even shown increases in blood glucose levels among diabetic patients, with peak changes over 300 mg/dL, lasting up to 7 days following the injection[9]. Nevertheless, currently there is no standard of care regarding MSK CSI use among diabetic patients and no major medical organization has made recommendations.

Objectives

- To determine the percentage of patients undergoing MSK CIS with a known diagnosis of diabetes (DM)
- To retrospectively assess for adverse diabetes-related healthcare events requiring acute intervention within 1 week following MSK CSI

Methods

Design: Retrospective chart review.
Participants: Study included 7,886 encounters of patients receiving 1 or more MSK CSIs between January 1, 2016 and April 30, 2019 from 17 outpatient clinics associated with a single, large community hospital in Dallas, TX.
Analysis: The key outcome variables were percentage of patients receiving site-specific MSK CSI with DM and rate of unexpected DM-related healthcare need occurring within 1 week of injection by site (axial and appendicular).

Results

We found 2,428 of 7,886 (30.8%) CSIs were administered to patients with DM. By injection site, 461 of 1,835 (25.2%) axial injections and 1,967 of 6,051 (32.5%) appendicular injections were administered to patients with DM. The patients receiving axial injections compared to appendicular injections were younger (58.5 +/-9.7 and 62.5 +/-10.0, respectively; p = 0.000) and had a lower baseline hemoglobin A1c level (6.9 +/-1.1 and 7.1 +/-1.4, respectively; p = 0.003).

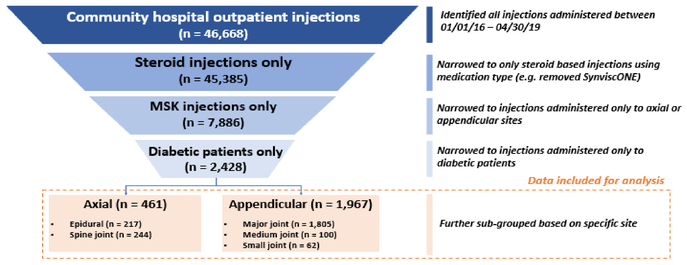

Figure 1. Frequency of outpatient steroid injections

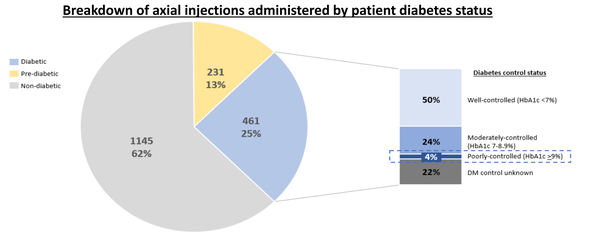

Figure 2. 25% of patients receiving axial steroid injections had diabetes with variable levels of control.

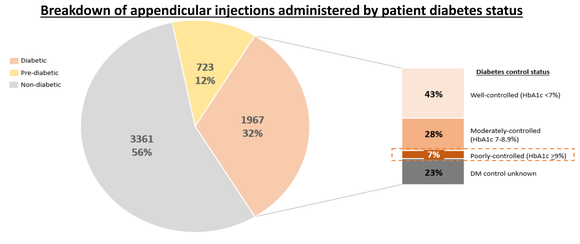

Figure 3. 32% of patients receiving appendicular steroid injections had diabetes with variable levels of control

Of the 2,428 injections administered to diabetic patients, 29 resulted in an unexpected encounter requiring an intervention. This included 1 hospital admission, 3 ER visits, and 25 outpatient visits and/or phone calls. All encounters were related to hyperglycemia or change in glucose control. Acute interventions included change in oral medication and/or insulin dosage, IV insulin, IV fluids and/or hospital admission. The overall adverse event rate was 1.19%, with rates of 0.65% and 1.32% for injections following axial and appendicular sites, respectively.

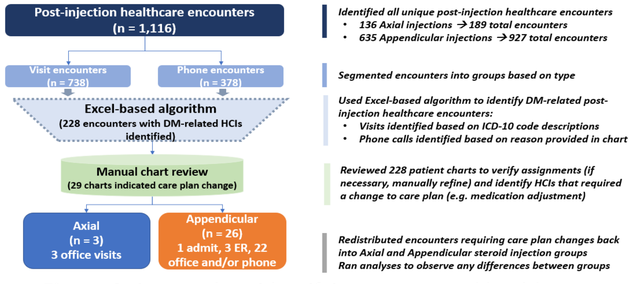

Figure 4. Approach to identifying unexpected healthcare encounters

Conclusions

This is the first report to assess glucose-related healthcare encounters following MSK CSI.

Based on this single-site, retrospective review, the adverse event rate associated with MSK CSIs is relatively low. We found 1.19% of injections required acute diabetic intervention in the week following injection. Moreover, adverse event rates were higher following appendicular versus axial injections, though baseline differences and low event rates limit between group comparisons.

Overall, further research is needed to identify the true adverse event rate. Next steps include using a prospective study to assess the relationship between diabetic control and the post-injection blood glucose signature.

References

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