Comparison of Triamcinolone and Methylprednisolone Efficacy and Steroid Flare Reaction Rates in Shoulder Corticosteroid Injection: A Randomized Parallel Study

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INTRODUCTION: Corticosteroid injections are used to reduce pain and inflammation for various shoulder pathologies. Corticosteroid flare reaction is a well-described phenomenon that, despite being self-limited, causes significant patient pain and dysfunction. Currently, there is a paucity of literature to drive the decision-making process between different corticosteroid medications. We compared the incidences of steroid flare reaction and 3-month efficacy following methylprednisolone acetate (MPA) and triamcinolone acetonide (TA) corticosteroid injections into the glenohumeral joint or subacromial space.

METHODS: This was a prospective, randomized parallel study. All injections were given into either the glenohumeral joint or subacromial space as indicated by four fellowship-trained shoulder and elbow or sports medicine orthopaedic surgeons to treat shoulder pathology. All injections were given utilizing standard sterile techniques after consent was obtained. During the first 3-month block, MPA was used in all injections and the second 3-month block TA was given. Injections consisted of 2cc of lidocaine, 2cc of bupivacaine, and 80mg of either MPA or TA. Visual analog scale (VAS) pain scores were recorded immediately prior to injection, on days 1-7 post-injection, and at 3 months post-injection. The primary outcome was incidence of steroid flare reaction, defined as a post-injection increase in VAS of at least two points compared to pre-injection VAS in the first week following injection. The secondary outcome was injection failure at three months post-injection. Injection failure was considered if VAS at 3 months was greater than pre-injection VAS or the patients had proceeded with another injection or surgery.

RESULTS: A total of 410 injections were given (199 MPA and 211 TA). Of these, 296 patients (72.2%) completed their first week of VAS pain scores, with 153 and 143 patients in the MPA and TA cohorts respectively. Significantly more patients in the MPA cohort reported a flare reaction compared to the TA cohort (37, 24.2% vs. 7, 4.9%; p<0.001) during the first post-injection week. A total of 329 patients (80.2%), 166 in the MPA cohort and 163 in the TA cohort, completed their three-month survey. No significant difference was seen in rates of injection failure between MPA and TA, respectively (77, 46.4% vs 62, 38.0%; p=0.125).

DISCUSSION AND CONCLUSION: Corticosteroid shoulder injections with TA resulted in a 5-fold reduction of steroid flare reactions with similar 3-month efficacy rates compared to patients receiving MPA. This study supports TA as a more viable corticosteroid selection for shoulder injections to treat shoulder pathology while minimizing risk of flare reaction compared to MPA.