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Case Report

Corticosteroid Induced Psychosis in the Pain Management Setting

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Background: Synthetic corticosteroids are commonly utilized in interventional pain management procedures. These substances have potential side-effects including psychological adverse events.

Objective: We describe a case of substance-induced psychotic disorder resulting from corticosteroids administration.

Design: Case Report

Methods: We describe a 67-year-old male that, six months prior to being consulted at our center, received a cervical epidural, 4 level medial branch blocks, 4 trigger point injections and a tendon injection in the shoulder all including corticosteroids all in one treatment session.

Results: Approximately 7 days following the multiple injections, the patient developed psychotic episodes including racing thoughts, anger, agitation, pressured hyperverbal speech and paranoia. The symptoms spontaneously resolved in approximately 7-10 days.

Discussion: Although well known as a potential complication, corticosteroid induced psychosis secondary to interventional pain procedures have never been reported. We further discuss this potential side effect of utilizing corticosteroids and emphasize the need for guidelines regarding steroid utilization.

Key words: Steroid, corticosteroid, psychosis, psychotic disorder

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The performance of common interventional pain procedures that utilize corticosteroids is rising (1). Adverse reactions in response to the administration of synthetic corticosteroids such as methylprednisolone and triamcinolone can include dermatologic conditions, peptic ulcer formation, weight gain, hyperglycemia, and Cushing's syndrome. More detailed descriptions of the spectrum of physiologic side effects have been previously published and are outside the scope of this case report (2,3). Psychiatric symptoms have also been reported and these can vary from mild mood changes to full blown psychosis (4,5). Despite the lack of reports in the pain literature, the current case emphasizes the potential of corticosteroid induced psychosis following multiple interventional pain procedures performed in one session.

A 67-year-old, Caucasian male was referred to our pain center for evaluation and management of chronic neck pain as a result of a fall 7 years prior. His

past medical history was significant for hypertension treated with nifedipine and polymylagia rheumatica treated with 5 mg daily dose of oral prednisone. The patient denied any past psychiatric history, including depressive or manic symptoms. Past surgical history included cholecystectomy, knee arthroscopy, ulnar nerve transposition, and 2 low back surgeries including a lumbar fusion. His chronic back pain was pharmacologically managed with morphine sulfate, duloxetne and amitriptyline. The patient had developed peptic ulcers, possibly as a result of long-term corticosteroid use, and was treated with ranitidine and sucralfate. Allergies included latex and levaquin. There was no family history of psychiatric illness. The patient was a non-smoker and had no history of alcohol or drug abuse. Physical examination was unremarkable with intact sensory and motor function. MRI revealed multilevel cervical facet arthropathy and a herniated C6-7 intervertebral disc.

Diagnostic and management planning included cervical facet joint injections. When this plan was discussed with the patient, he became hesitant towards the use of anti-inflammatory steroids and stated that he had a reaction to prior steroid administration. Approximately 6 months before, at a different pain clinic, the patient had received, in one treatment session, a cervical epidural steroid injection (80 mg methyl-prednisolone), 4 level (C2-C6) right medial branch blocks (each with 5 mg triancinolone), 4 trigger point injections, and one tendon injection in the left shoulder (unknown amount of steroids). Approximately 7 days following the injections, the patient developed very aggressive and hostile personality and behavioral changes. The patient indicated that during this time he suffered from insomnia, racing thoughts, anger, agitation, pressured hyperverbal speech and paranoia. The racing thoughts were constant and the patient could not shut them off. The patient further reported that he suffered from confusion and a loss of appetite resulting in weight loss. The patient's wife reported that he was agitated, sweating, and confrontational with violent tendencies. The episode lasted 7 – 10 days culminating in his arrest after threatening the life of his wife to which he had been happily married for 39 years. He was charged with attempted murder, and upon release the patient reported that the symptoms eventually subsided in an 8-week period following the episode (without psychiatric treatment). The patient is now back living with his wife. His mental status examination well after the episode was within normal limits, with no evidence of cognitive impairment and no evidence of mood problems, anxiety, or psychosis.

The psychiatric effects of corticosteroids can include headache, insomnia, depression, and mood disorders (including bipolar and manic states) with or without psychotic episodes (4-12). In an original report, Wada and colleagues (11) described a case series of 18 patients (2,069 screened patients) without prior psychiatric history, DSM-IV criteria for corticosteroid-induced psychotic or mood disorder, and symptoms persisting for at least 7 days. The prevalence of symptoms among referred cases was less than one percent, with 15 cases presenting as mood disorders and 3 cases presenting as psychotic disorder. The majority of patients demonstrated manic or bipolar symptoms and approximately half demonstrated psychotic features. In the current case report, the patient did not have prior psychiatric history. Moreover, the patient was taking prednisone and amitriptyline for a prolonged period of time without developing acute manic or psychotic symptoms supporting the belief that the acute onset was caused by the multiple steroid injections.

The half-life of methylprednisolone and triamcinolone are approximately 12–40 hours, however the onset of action can be much longer (3–7 days), especially when intraarticular or epidural routes are used (13). The time course of pain relief is consistent with reported onset of corticosteroid induced psychiatric symptoms (8,10,14), although the onset seems to be quite variable between patients (3–11 days; 86% show symptoms within 7 days).

The Boston Collaborative Drug Surveillance Program demonstrated a dose related corticosteroid induced incidence of psychiatric disturbances with an upward onset in 18.6% patients receiving > 80 mg prednisone (approximately the same dose equivalence of methylprednisolone), 4.6% when the dose was 41-80 mg/day and 1.3% when dose was 40 mg or less per day (15). It seems that higher doses of steroid predispose individuals to suffer from psychiatric episodes, although it is unclear if the dose impacts the development of psychosis specifically. From available evidence, the dose does not seem to affect the rate of onset, duration, or severity (16,17). This case would suggest that dose did play a role since the patient was already taking 5 mg oral corticosteroid prior to the interventional procedures without developing psychosis. Additionally, the total dose reported for this patient was in

the high range compared to the previously published data linking corticosteroids and psychotic episodes (15). In the current case, the patient was not taking any other medications that could possibly trigger a psychotic episode (the patient was on a stable dose of prednisone without psychosis). Moreover, the lack of manic symptoms despite taking duloxetine further shows a lack of primary psychiatric disorder.

There have been reports of corticosteroid induced psychosis following both single (hip; 80 mg depomedrone) and multiple intraarticular (bilateral shoulders; 40 mg methylprednisolone each) injections. In both cases, patients suffered delusional and disorienting episodes (18,19). These doses were slightly less than the total dose the patient in the current report received, however one should take into account dose equivalents when comparing total absolute doses of corticosteroids (2,3,20). Similar doses of corticosteroids are reported in interventional pain procedures such as epidural injections, facet joint injections, and sacroiliac joint injections (1,21). While other adverse events have been reported for similar interventional injection procedures (such as those utilized in the current case) (21), we could not find any reported cases of toxic corticosteroid induced psychotic disorders following interventional pain procedures. The route of administration (e.g. oral versus injected) does not seem to influence the prevalence of psychological side effects. As such, we would anticipate that adverse psychological events, including psychotic disorder, following single or multiple procedures involving the administration of corticosteroids (especially in doses > 80 mg) over a short period of time could occur.

Although there is a sparse literature and little consensus on maximal dosing and side effects of corticosteroids when utilized in interventional techniques, utilizing the least dose possible for efficacy may help avoid these adverse events (2,3,20). Clearly more research is required to more fully understand what the minimally effective doses are, how many injections should maximally be given annually and what the spectrum of side effects are when using steroids in interventional procedures as opposed to oral dosing. This information would be very beneficial in determining the best safe practice of interventional pain management procedures. Until these data are available, we feel it is important that interventional pain physicians treating patients with corticosteroid injections recognize the potential for these agents to produce psychological side effects including psychosis.

According to guidelines published by the American Society of Interventional Pain Physicians (ASIPP), 2 diagnostic medial branch blocks should not occur sooner than 1 week apart and preferably not sooner than 2 weeks apart. Then in the therapeutic phase, injections should not occur less than 2–3 months apart. The guidelines go on to indicate that multiple interventional procedures should be performed at intervals of no less than 1–2 weeks apart. Clearly, the number of injections performed in the current case within a very limited time period falls outside the guidelines published by ASIPP. Thus, this case helps to validate the guidelines and lends justification of limiting procedures based upon corticosteroid pharmacology.

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