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Guest Editorial

A needless stab in the back: Do the benefits of using steroid injections for back and radicular pain outweigh its risks?

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1. Introduction

Lower back pain is a major public health problem worldwide and is the single largest cause of disability in the United Kingdom [1]. The morbidity and the disability from lower back pain is enormous from both personal and societal perspectives [2]. The prevalence of lower back pain creates increased demand and high costs for the National Health Service (NHS), estimated at around £12.3 billion per annum [3].

The National Institute for Health and Care Excellence (NICE) guidelines for lower back pain recommend conservative management as first-line [4]. The GIRFT spinal report shows that between 2015 and 2018, almost 6% of patients with back pain received three or more spinal injections in a year, costing over £10 million [5].

Multiple studies have identified that there are no sustained positive outcomes for low back pain from the use of multiple spinal injections [5]. A randomised control trial by Iversen et al. concluded that treatment of lumbar radiculopathy with caudal epidural injection of steroids or isotonic saline had no clinically significant effects [6]. Aside from limited long-term benefits, spinal steroid injections can be debilitating, causing: site infection, bleeding, headache, nerve damage, and paralysis [7].

2. Facet joint injections for low back pain

Conservative management of lower back pain focuses on rehabilitation and strengthening muscles to provide better support. Collagen is a fibrous protein that is the primary constituent of connective tissue and a part of the extracellular matrix which creates a sheath around muscle fibres to provide support and protection [8]. In natural aging, the production of collagen decreases, leading to deterioration and weakening of muscles. Collagen type II is a major matrix component of the nucleus pulposus and is downregulated in degenerative disc disease [9].

Repeated exposure to injected corticosteroids has been hypothesised to enhance collagen degradation [10]. Animal studies have shown that multiple glucocorticoid injections induce a decrease in prolyl hydroxylase, dampening collagen biosynthesis [11]. A systematic review identified that corticosteroid injections decrease cellular proliferation, alter collagen and extracellular matrix composition, and impede inflammatory pathways [12].

The health of paraspinal muscles plays a crucial role in spinal strength, and dysfunction in these muscles

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is common in chronic lower back pain [13]. Muscle wasting caused by glucocorticoids is characterised by increased expression of ubiquitin ligases which control protein degradation [14]. Forkhead-box-O-1 (FOXO1) regulates atrogin-1 and MuRF1 expression in muscle atrophy conditions; glucocorticoids induce the upregulation of FOXO1, meaning that increased exposure to glucocorticoids directly increases protein degeneration and muscle atrophy [15].

Two cell types crucial to muscle growth and regeneration are muscle satellite cells and fibro-adipogenic-progenitor cells (FAPs) [14]. Glucocorticoids also downregulate MyoD, a protein that facilitates the regeneration of muscle satellite cells, resulting in the muscle's failure to adapt to functional demands and making atrophy a serious side effect of steroids [14,16].

3. Epidural steroid injection for disc prolapse

A seven-year follow-up study showed that 83% of patients with massive prolapsed discs had a complete and sustained recovery, with a mean decrease in disability from 58% to 15% [17]. The body's own inflammatory response assists in the regression of lumbar disc herniation [18]. Macrophages are important immune players in the resorption of herniated discs, actively phagocytizing the herniated tissue and processing it in their lysosomes filled with collagen-degrading enzymes [19].

Intervertebral discs are the largest avascular organ in the body, with a unique structure that excludes them from the development of immunologic tolerance, making them an immune-privileged organ with no access to the systemic circulation [18]. Once the nucleus pulposus extrudes beyond the annulus fibrosus, the host's immune system recognises it as a foreign body. Injury leads to the release of cytokines evoking an autoimmune reaction. Current evidence suggests that the degenerate disc might need the assistance of immune cells to restore its structure and lessen inflammation [18].

The inflammatory response associated with intervertebral disc herniation is crucial for spontaneous regression, and inflammation could be regarded as a good prognostic indicator for the regression of disc prolapse and resolution of symptoms [19]. Corticosteroids minimize the production and release of cytokines by inhibiting Phospholipase A2, slowing the natural response and increasing recovery time [20].

There is high variation in the frequency of use and dosage of multiple steroid injections across the United Kingdom [5]. The highest rates of repeated injections are seen in trusts without spinal surgery as an option, while GIRFT's data shows widespread non-compliance with current guidance on the use of injections [5].

4. Conclusion

The longer-term management of lower back pain with epidural steroid injections remains unclear regarding quality-of-life improvement, patient safety, and cost-benefit. The body's own inflammatory status allows for the regression of disc prolapse and rehabilitation. Further research is required to identify the need for steroid injections in managing lower back and radicular pain.

Conflict of interest

None to report.

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