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The prevalence and regeneration of painful degenerate Lumbar Intervertebral Discs

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Statement of the Problem: Chronic Low Back Pain is expensive because it is challenging to diagnose and treat and due to its loss of associated productivity. For decades, experts speculated that the source of chronic Low Back Pain (LBP) could not be identified. The derivation of this concept was a 1966 publication by two general physicians before the advent of advanced imaging and validated diagnostic spine procedures. Since 1995, five international research papers have been published in peer-reviewed fashion attesting to the prevalence of painful lumbar discs. Indeed, lumbar discs have been observed to be the source of LBP in adults and appear to be more common in younger than older adults. The morphologic substrate of painful intervertebral lumbar discs is annular fissures that are flanked by innervated granulation tissue in association with a catabolic state. Therefore, strategic treatments would address these non-healing fissures in an attempt to regenerate the disc and restore an anabolic state within the affected disc.

Methodology: A literature review was conducted to identify and review all studies investigating the prevalence of painful intervertebral discs. Studies were included if valid diagnostic spine procedures were employed adhering to stringent operational criteria. Publications without utilizing sound diagnostic spine procedures were excluded from the final analysis. Similarly, a literature review was conducted of all studies of intradiscal regenerative treatments. Also, current FDA regulated intradiscal clinical trials in the USA were included in this summary.

Findings: Overall, the prevalence of discogenic LBP from worldwide studies is 26-56% with a combined 95% confidence interval of 17-62%. The mean age of these patients ranged from 41-46 years. The probability of discogenic LBP increases with younger age. Prospective outcome data suggest that autologous Bone Marrow Aspirate Concentrate (BMAC) and Platelet Rich Plasma (PRP) may reduce LBP and disability. Allogenic Mesenchymal Stem Cells appear more effective than controls in reducing LBP and disability.

Conclusion: The intervertebral disc is a common source of LBP due to non-healing annular fissures and its probability increases in younger adults. Regenerative medicine treatments are actively being pursued. Autologous BMAC and PRP need more rigorous follow-up study and a randomized, controlled trial of BMAC is underway in the USA. Allogeneic Stem Cells and Disc Chondrocytes are being investigated. Phase II RCT data indicates Allogeneic Mesenchymal Stem Cells are effective at reducing discogenic LBP.

Biography

Michael J DePalma is President and Medical Director of Virginia iSpine Physicians, where he practices Interventional Spine Care. He earned his Bachelors of Science Degree in Neuroscience with magna cum laude and certificate in Foundations of Medicine from the Honors College of the University of Pittsburgh in 1995. After earning his medical degree cum laude from the Medical University of South Carolina in 1999, he completed his residency in the highly regarded Department of Physical Medicine and Rehabilitation at the Ohio State University Medical Center. He has been named by his peer physicians as a "Top Doc" in Richmond Magazine in April 2008, 2011 and 2012. He is also an active spine researcher and pioneer involved as an investigator in clinical trials evaluating new agents that help repair or restore painfully degenerated Intervertebral Discs in the low back. He was the lead investigator at VCU in the largest prospective study of an innovative non-surgical technique to stabilize painful pelvic fractures in osteoporotic patients. His research was recently recognized by the International Spine Intervention Society as the "Best Clinical Paper" at their 17th Annual Scientific Meeting in Toronto, CA.

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