## Do Pediatric Patients with Adolescent Idiopathic Scoliosis Exhibit Better Pain Control After a Posterior Spinal Fusion when Treated with Liposomal Bupivacaine?

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INTRODUCTION: Liposomal bupivacaine (LB) has been promoted for its apparent long-lasting effects on pain management when compared to standard formulations. Many studies in adult spine populations have been carried out with varying results but few studies have investigated LB's effect in the pediatric population. The aim of this study is to investigate LB's effects on pain control and narcotic use in the pediatric population.

METHODS: 476 AIS patients undergoing posterior spinal fusion (PSF) between 2018 – 2023 by three senior attending physicians were included. Starting early 2020, patients began receiving peri-incisional injections of LB by plastic surgeons during PSF closure (LB Group). These patients were compared to those that did not receive any injections (Non-LB [N-LB] Group). Maximum VAS pain scores, time to ambulation (abbreviated as out-of-bed/OOB), length of stay (LOS), narcotic refills, and 90- day complications were recorded and analyzed. Kruskal-Wallis tests were used to analyze continuous variables and Chi-Square for categorical variables.

RESULTS: 295 patients received a LB injection (LB Group), and 181 patients did not (N-LB Group). No differences were noted in demographics. Maximum pain scores during activity were significantly lower on POD 1, POD 2, and overall ($p<0.05$). Length of stay was significantly shorter in LB patients ($<0.001$). There were no significant differences in rates of complications, or transfusions ($p>0.05$). Significantly more patients were out of bed by POD 0 (59.9% vs 38.0%, $p<0.001$) in the LB group. LB patients consumed significantly less opioids in 0-24 hours postop and in during their total hospital stay ($p<0.001$ and $p=0.03$, respectively).

DISCUSSION AND CONCLUSION: LB patients had lower VAS pain scores, morphine consumption, and length of stay with no significant increase in complications. This suggests that a long-acting local anesthetic formulation may offer superior pain management and clinical benefits.