Oct 13th, 12:00 AM

Evaluation of Medial Branch Blocks for Lumbar Facet Joint Radiofrequency Ablation: What is the Role of the Second Diagnostic Block?

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Introduction

Lumbar medial branch (LMB) radiofrequency ablation (RFA) is a procedure commonly performed to treat facet joint-mediated pain. One challenge presented by LMB RFA is appropriately selecting patients.[1] Pain medicine organizations have recommended using diagnostic dual and comparative local anesthetic blocks.[2,3,4] However, one must account for associated additional costs, humanistic factors, and risks of excluding individuals that may benefit from RFA.[3] **This study aims to further elucidate the value of the second block in providing relevant prognostic data for appropriately selecting patients for RFA.** Following IRB approval, a retrospective review was conducted on patients who underwent at least one lumbar medial branch block (MBB) procedure from September 2013 to June 2019. A successful block was defined as resulting in ≥50% pain relief accompanied by patient satisfaction with degree of pain relief. Patient dissatisfaction was defined as pain relief that was ≥50% but below the degree and/or duration necessary for the patient to proceed to the second block. In addition to demographic data, data was gathered on medial branch blocks, including type of anesthetic as well as length and degree of relief. Length of pain relief was defined as the length of time until the reported numerical pain rating scale (NPRS) for back pain returned to baseline NPRS (i.e., prior to MBB). Duration of relief achieved with each local anesthetic and its influence on successful MBB outcomes were also evaluated. Adverse events were recorded. Proportions were compared by exact binomial tests within categories and Fisher's exact test across categories.

Demographic Data

	Number of Patients (n=474)	Percent of Patients (%)
% Female	253	53
% Male	221	47
Mean Age ± Standard Deviation	61.6 ± 14.2	N/A
Chronic Opioid Use:		
Nonchronic Users (0 mg/day)	292	62
Low Dose Users (<25 mg/day)	136	29
Medium Dose Users (25-50 mg/day)	34	7
High Dose Users (>50 mg/day)	12	3
Tobacco Use:		
Non-Tobacco Users	384	81
Tobacco Users	90	19
Unreported	1	0
Previous Back Surgery	61	13

Table 1. Demographic data of patients who underwent lumbar MBB with local anesthetic only by injection**.**

Pain Relief from 1st MBB

	Number of Patients (n=474)	Percent of Patients (%)
<50% Pain Relief	147	31
50-70% Pain Relief	99	21
>70% Pain Relief	206	43
Unable to Determine Relief	22	5

Table 2. Reported degrees of patient pain relief following first MBB. More than half of patients (54%) had a successful first block (n=255).

Pain Relief from 2nd MBB

	Number of Patients (n=255)	Percent of Patients (%)
<50% Pain Relief	39	15
50-70% Pain Relief	41	16
>70% Pain Relief	168	66
Unable to Determine Relief	7	3

Table 3. Reported degrees of patient pain relief following second MBB. 73% of patients had a successful second block (n=188).

Patient Outcomes Based on Pain Relief from 2nd MBB

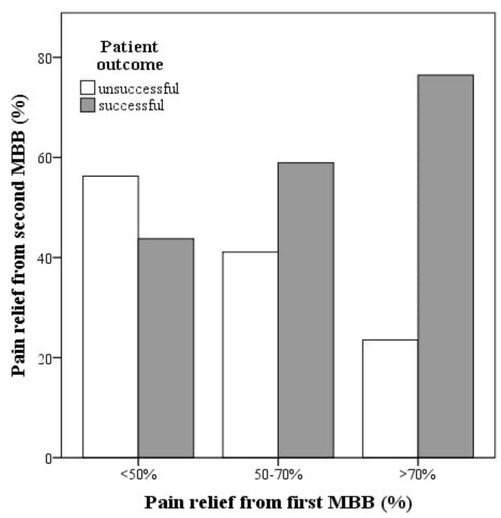

Figure 1. Relative Frequency Histogram of Patient Outcomes Based on Pain Relief from Second MBB. Only patients with >70% pain relief from the first block experienced significantly (p<0.03) greater pain relief and satisfaction with the second block. Patients with <50% and 50-70% pain relief from the first block did not experience significantly greater pain relief with the second block (p=0.80 and 0.34, respectively), nor was this pain relief significantly different across groups of patients (p=0.39).

Patient Outcomes Based on Pain Relief Duration from Lidocaine

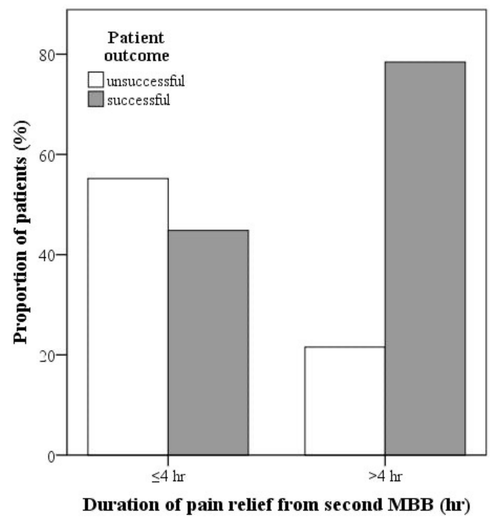

Figure 2. Relative Frequency Histogram of Patient Outcomes Based on Duration of Pain Relief from Lidocaine. For patients who received lidocaine as their second MBB, a significant proportion (78%, p<0.001) of patients whose pain relief lasted >4 hours had successful outcomes. However, only 45% of patients with ≤ 4hrs of relief were successful following the second block (p=0.71).

Conclusion

A second diagnostic MBB could be deemed valuable if it significantly alters RFA patient selection and improves clinical outcomes, but one would need to weigh this benefit against the additional associated healthcare costs and humanistic burden of having a patient undergo a second block. In this study, 54% of patients had a successful first block, suggesting that facet joints were a source of low back pain. This proportion is above the accepted published range of 15-45% for patients with low back pain from facet joints.[5] Combining results from the first and second blocks, 44% of patients had facet joint-mediated pain. Therefore, the data suggests that some individuals without facet joint-mediated pain may have reported a successful first block. **In this study, most patients (73%) who had a successful first MBB had a successful second MBB. In individuals experiencing >70% pain relief from the first block, a second block did not significantly alter RFA selection** (approximately 80% had a positive second block), suggesting that in this subgroup a second block may not add additional diagnostic information. Furthermore, this study questions the benefit of adding comparative local anesthetic blocks to the selection process. Most individuals who underwent lidocaine block had >4 hours of pain relief, which is beyond the suggested pharmacology-based duration of action for lidocaine (<2 hrs). Also, individuals with >4 hrs of pain relief from lidocaine were more likely to report a successful block, a result difficult to define based on clinical pharmacology. Continued research is needed to determine whether the second diagnostic block provides helpful prognostic data that positively influences patient selection and RFA outcomes.

References

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