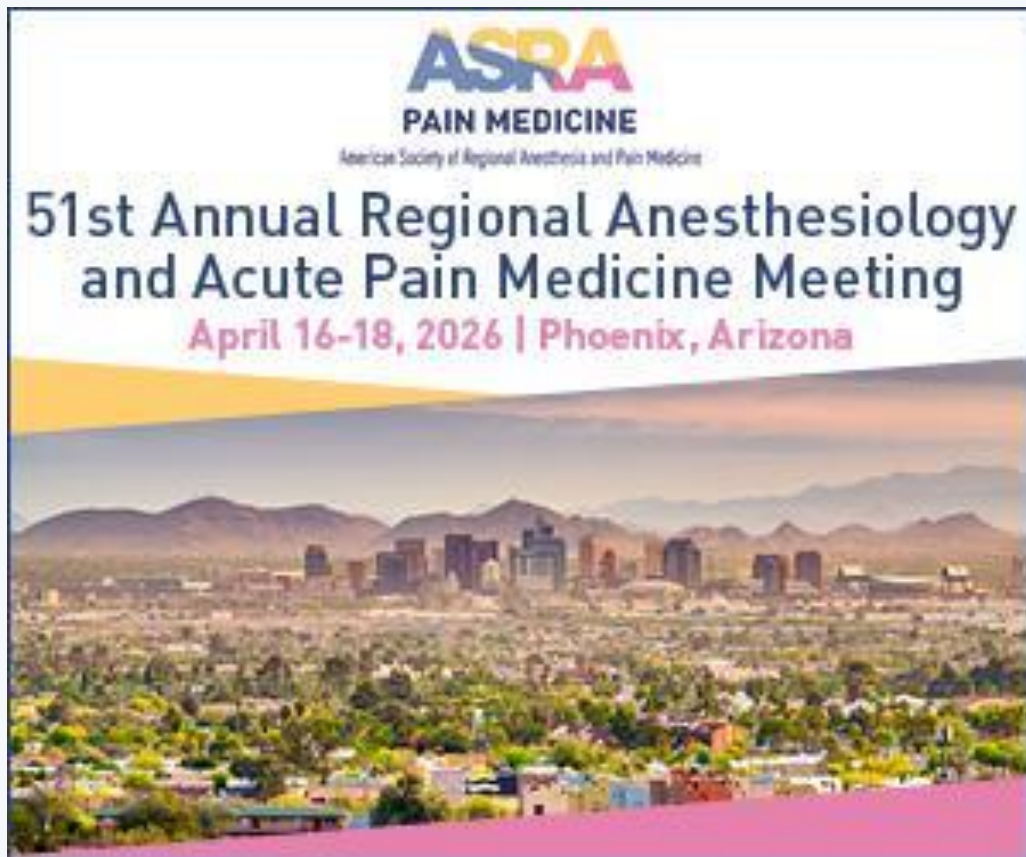




#2318153 Evaluation of the GRACE model to teach regional anesthesia at a Resource-Limited Setting in India

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INTRODUCTION

Surgical disease is an under-addressed burden in low-income countries (LICs), necessitating an increase in anesthesia collaboration programs to enhance perioperative care. In 2017, a model for teaching and evaluating a regional anesthesia program, the GRACE initiative, was introduced in Ghana. Building on this foundation, this study applies the GRACE model to a LIC site in Hyderabad, India, and evaluates its impact on peripheral nerve block use in clinical practice compared to pre-implementation levels.

METHODS

- This study received approval from our IRB (IRB #2019-0321).
- In 2019, anesthesiologists from the Hospital for Special Surgery utilized the GRACE (Global Regional Anesthesia Curricular Engagement) model to develop a customized regional anesthesia curriculum.
- The GRACE model was used to train thirteen anesthesiologists at Osmania General Hospital (OGH) and evaluate the change in participant skills and knowledge.
- Additionally, to assess changes in clinical practice, a retrospective review of surgical records at OGH was conducted to gather data on pre-operative diagnoses, surgical procedures, anesthesia types, anesthetic medications administered, peripheral nerve block (PNB) types, supplementary interventions, and the performing providers.
- Data collection occurred at five distinct one-month intervals: prior to the intervention in May 2019; and subsequently in July 2019, December 2019, March 2023, and May 2024.
- Paired Wilcoxon rank-sum tests were used for the pre- and post-intervention comparison of clinical and knowledge assessment scores, and Chi-squared tests were conducted to analyze trends in PNB utilization over time.

The GRACE program was associated with an increased and sustained use of regional anesthesia

Table 1: Knowledge Assessment, Clinical Assessment, and Global Rating Scale scores, before and after GRACE program

	N	Median	IQR	min	max	p-value
Knowledge Assessment						
pre-GRACE	13	0.41	0.34, 0.44	0.2 2	0.53	<0.0001
post-GRACE	13	0.73	0.63, 0.80	0.4 3	0.87	
Clinical Assessment						
pre-GRACE	13	0.29	0.29, 0.43	0.0 7	0.86	<0.0001
post-GRACE	13	0.93	0.79, 1.0	0.6 2	1	
Global Rating Scale						
pre-GRACE	13	1.29	1.0, 2.0	0.1 4	2.29	<0.0001
post-GRACE	13	3.71	3.43, 4.0	2.4 3	4.57	

Figure 1: Percentage of Orthopedic Procedures Using PNBs at Osmania General Hospital (May 2019-May 2024).

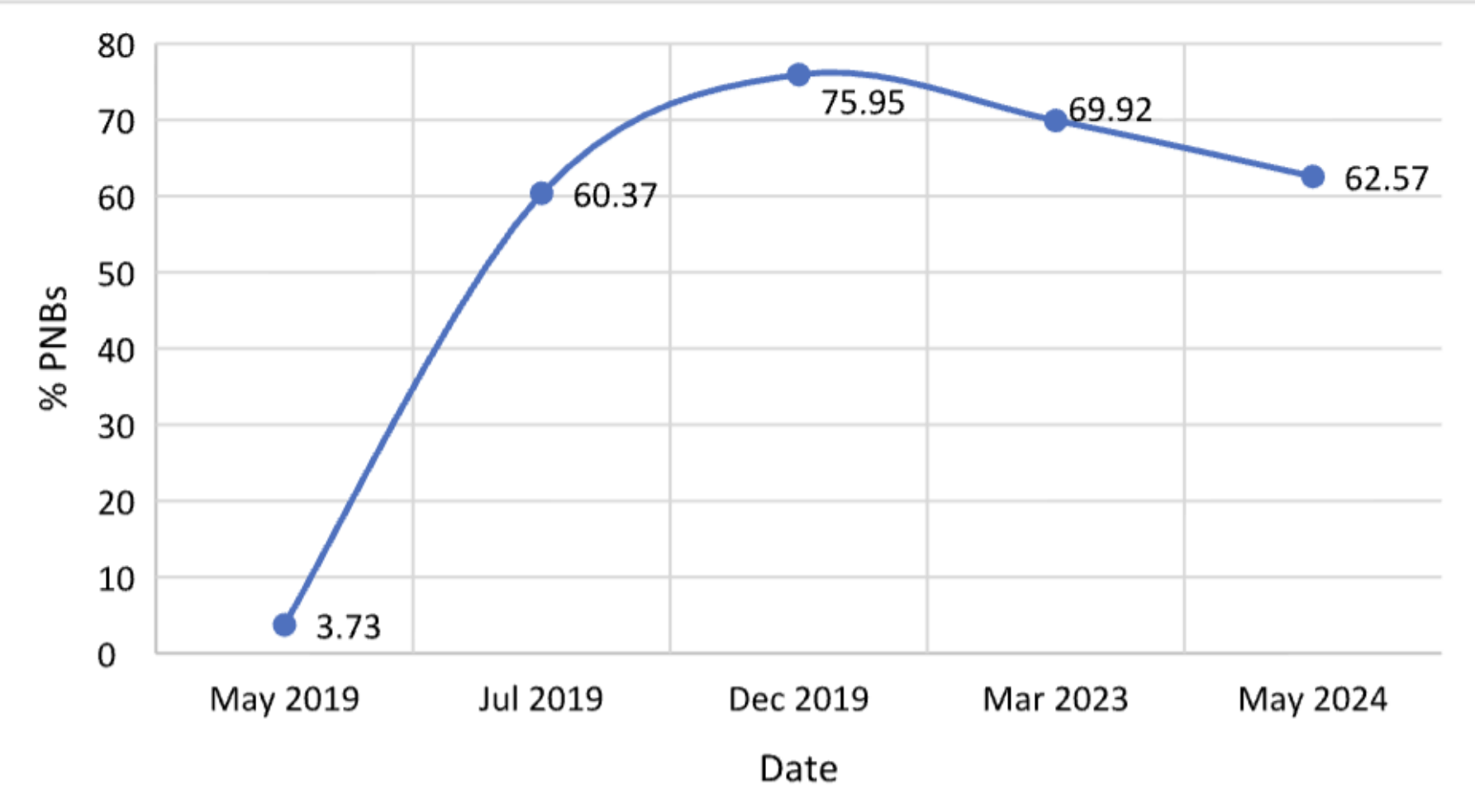
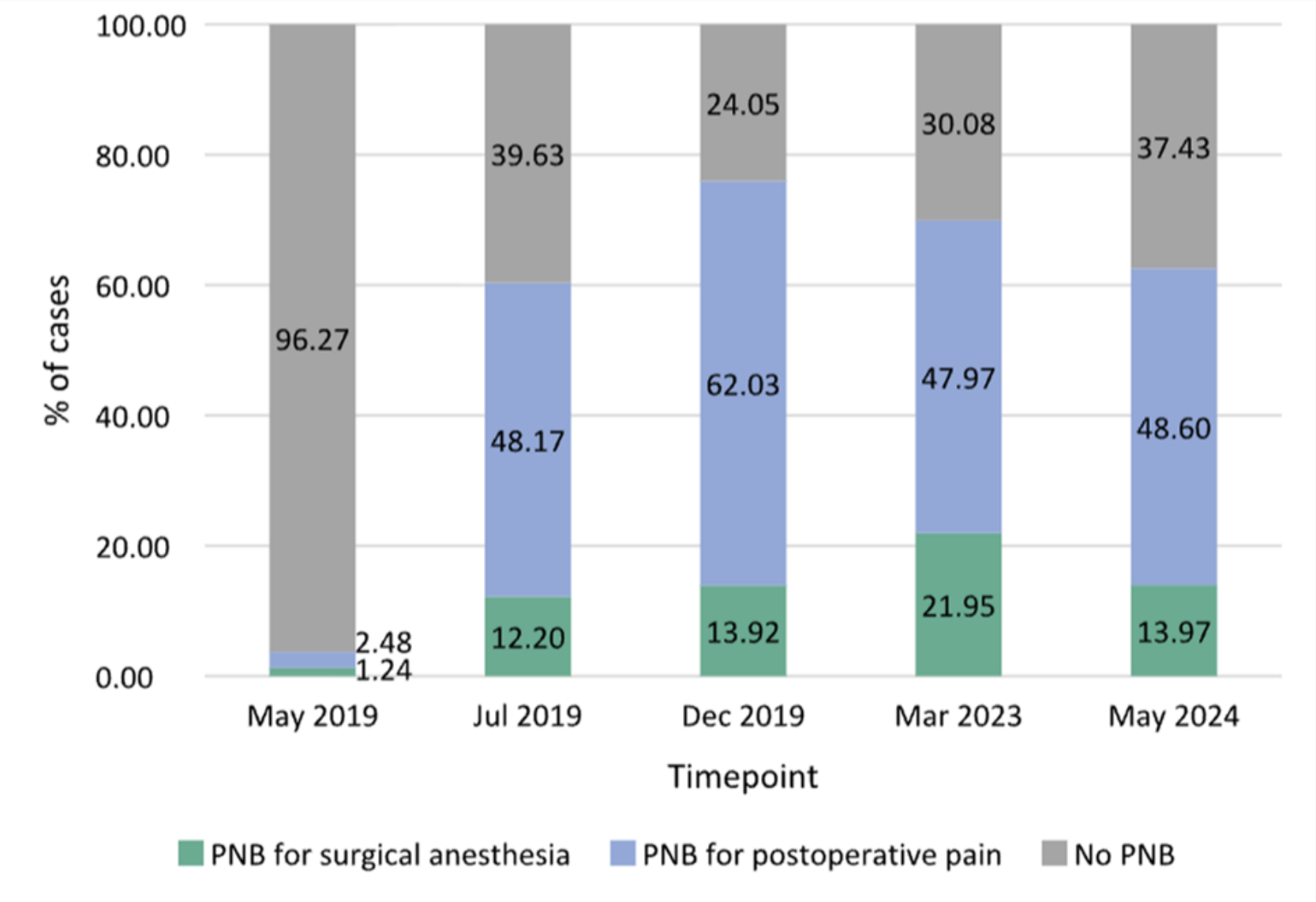


Figure 2: Type of PNB Use in Orthopedic Surgeries at Osmania General Hospital (May 2019-May 2024).



References:



RESULTS

Pre- and post-intervention evaluations indicated that the GRACE program was highly effective when trainees demonstrated significant improvements in median scores on the knowledge examination, clinical test, and Global Rating Scale, increasing from 41% to 73% ($p < 0.0001$), 29% to 93% ($p < 0.0001$), and 1.29 to 3.71 out of 5 ($p < 0.0001$), respectively (**Table 1**).

In May 2019, prior to the GRACE program, 161 orthopedic surgeries were performed at OGH, subsequent time-points showed the following surgery numbers: July 2019, 164; December 2019, 158; March 2023, 123; and May 2024, 179. The proportion of orthopedic cases utilizing peripheral nerve blocks (PNBs) increased from 3.7% before the GRACE program (May 2019) to 60.37% directly after the GRACE program (July 2019), with sustained PNB use at 75.95% in December 2019, 69.9% in March 2023, and 62.6% in May 2024 (**Figure 1**). The majority of PNBs were administered for postoperative pain relief rather than as the primary anesthetic technique (**Figure 2**). No cases were recorded as requiring supplementation for the peripheral nerve blocks performed.

DISCUSSION

Global anesthesia collaborations between HICs and LICs have increased, although limited data exist regarding methodology and outcomes. This study assessed the reproducibility of the GRACE teaching model at an additional LIC site and evaluated the impact on clinical practice. The GRACE program was associated with an increased and sustained use of regional anesthesia at OGH several years after the program's conclusion. Additionally, the practice was disseminated to and utilized by non-GRACE participants. Additionally, 17 physicians who did not participate in the original 2019 GRACE teaching program were documented as performing regional anesthesia techniques at the studied time points showing future dissemination of methods learned.