Commentary

Unlocking precision pain relief: The rise of fascial plane blocks in perioperative care: A commentary

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Fascial plane blocks (FPBs) have emerged as a promising tool for intraoperative and postoperative analgesia. Unlike traditional nerve blocks, FPBs involve injecting local anaesthetics into fascial planes surrounding groups of nerves, guided by ultrasonography. This commentary aims to review and analyse the recent trends in research and clinical practice regarding FPBs for postoperative pain management, based on articles published in the Indian Journal of Anaesthesia (IJA) from 2022 to 2023. The focus is on identifying the applicability, efficacy and potential of FPBs compared to traditional individual nerve blocks or non-block care, while also highlighting the limitations and areas for future research.

Traditional individual nerve blocks are excluded from this review.

Firstly, 35 articles [25 randomised controlled trials (RCTs), one non-RCT, three meta-analyses and systematic reviews and six case series] have been published on FPBs in the last 2 years. For ease of analysis, we divided the articles into those dealing with FPB- used in thoracic surgeries (n = 16), abdominal surgeries (n = 9) and limb surgeries (n = 11). These numbers indicate large interest and wide applicability of FPBs in research and clinical practice. Three RCTs and one retrospective series were published in the IJA. The predominance of RCTs indicates that FPBs have surpassed the phase of novelty and are being scrutinised and compared with the traditional methods of analgesia.

Among the RCTs in thoracic surgeries, the most commonly featured block was the erector spinae plane block (ESPB). Ten RCTs compared ESPB to various other blocks like serratus anterior plane block (SAPB), paravertebral block and thoracic epidural analgesia, in various thoracic procedures like modified radical mastectomy,[1,2] rib fractures,[3] thoracotomy,[4] spine surgeries[5,6] and upper abdominal surgeries like laparoscopic cholecystectomy and percutaneous nephrolithotomy.[7-10] Compared to 'non-block care' or wound infiltration, ESPB provided superior analgesia and reduced the requirement for rescue analgesics. Although most of the RCTs involved single-shot injection of local anaesthetics below the erector spinae muscle, a couple of RCTs compared continuous infusion of local anaesthetics in the erector spinae space to continuous epidural or paravertebral infusion for thoracic surgeries. ESPB was found to provide comparable analgesia with epidural and paravertebral blocks.[5,7] Another commonly used thoracic FPB was SAPB. A meta-analysis that compared various analgesic modalities in breast surgeries showed that single-injection SAPB was significantly superior in reducing opioid consumption in the first 24 h compared to non-block care.[11] In addition, analgesia

was comparable with the pectoral nerve block and paravertebral block. Another study showed that SAPB was equally efficacious when delivered either superficial or deep to the serratus anterior muscle.[12] A modification of SAPB, serratus posterior superior intercostal nerve block, was superior to non-block care in video-assisted thoracoscopic surgeries.[13] Other thoracic truncal blocks, such as the 'mid-point of the transverse process to pleura' block, showed benefits in reducing thoracotomy pain.[14] Interestingly, ESPB was compared for analgesia following lower segment caesarean section (LSCS); however, quadratus lumborum block (QLB) was superior to ESPB in these surgeries.[15] Thus, ESPB and SAPB provided a comparable alternative for thoracic epidural and paravertebral blocks in reducing pain following thoracic surgeries.

For abdominal surgeries, there were a variety of FPBs like transversus abdominis plane block (TAPB), transversalis fascia plane block (TFPB) and QLB. QLBs were superior to the inguinal nerve blocks and TAPB for inguinal hernia surgeries.[16-18] A meta-analysis on TFPB versus non-block care in LSCS surgeries showed that TFPB was superior in postoperative analgesia.[19] Similar findings were also reported by a couple of studies that compared TFPB and TAPB with non-block care in LSCS surgeries.[20,21] In another RCT, TFPB was comparable with TAPB for postoperative analgesia following LSCS.[22] TAPB was found superior to SAPB for analgesia following laparoscopic cholecystectomy.[23] Surprisingly, there were no studies that compared epidural analgesia with FPBs in abdominal surgeries. However, one RCT compared TAPB with caudal analgesia in lower abdominal surgeries in paediatric patients and found that caudal analgesia was better than TAPB in postoperative pain management.[24]

FPBs used for hip surgeries included pericapsular nerve group (PENG) block, parasacral ischial plane block and fascia iliaca plane block.[25,26] A couple of RCTs and a meta-analysis comparing analgesia modalities for total hip arthroplasty showed the superiority of QLB and PENG blocks over fascia iliaca blocks.[27-30] A few interesting case series showed the successful use of FPBs in conditions where general anaesthesia or epidural analgesia was associated with high risk.[31,32] For knee surgeries, emerging techniques like modified 4-in-1 block, which is a motor-sparing nerve block targeting the nerve to vastus medialis, was found comparable with I-PACK (infiltration between the popliteal artery and the capsule of the knee joint) with adductor canal block.[33] In another case series, clavipectoral fascia block was used successfully in patients undergoing clavicular surgeries.[34]

Historically, interventional analgesic options for spine surgeries have mainly utilised neuraxial techniques, such as direct insertion of epidural catheters under vision, or local infiltration. Hence, it was interesting to find three RCTs trying ESPB and thoracolumbar interfascial plane block in spine surgeries.[5,6,35]

The common finding of all RCTs was that FPBs provided superior analgesia in the early postoperative period (i.e. up to 24–48 h) compared to non-block care. Reduction in opioid or rescue analgesic consumption and lack of major complications were other advantages of FPBs. Compared with 'non-block care', all three meta-analyses found FPBs superior in postoperative pain management. Meta-analyses were limited by heterogeneity among RCTs. Limitations of RCTs include the following: single-centre studies, small sample sizes, lack of dose finding, non-reporting of effect on chronic pain, time required for the block and failure rates at the hands of novices. Most were single blinded, which increased the risk of bias. In addition, rare complications like myotoxicity and local anaesthetic systemic toxicity were not reported.

Despite the limitations of current evidence and the need for further research, FPBs hold immense potential as valuable tools in the anaesthetist's toolkit. The superficial nature of the procedure, availability of ultrasound machines in operating rooms, fewer contraindications and lack of major haemodynamic and neurological complications (like early recovery and mobilisation, especially in lower limb FPBs) are some of the reasons behind the upsurge of FPBs. Future research should involve multicentric RCTs that are required to assess the applicability of FPBs in diverse populations and clinical settings. The cost-effectiveness of FPBs, their impact on perioperative neuroendocrine stress response, their complications and side effects, comparison with epidural analgesia in major thoracoabdominal surgeries and their impact on long-term post-surgical outcomes need to be further analysed.

In conclusion, the rise of FPBs is revolutionising perioperative care by offering precise and effective pain relief. Supported by extensive research and clinical practice, these blocks provide a promising alternative

to conventional analgesic methods, enhancing patient outcomes and expanding the anaesthetist's toolkit.

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