

Can Ultrasound Guided Regional Anesthesia Improve Rural Anesthesia Services and Address Safety Issues in Low Income Country? Perspective from Nepal

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ABSTRACT

Provision of anesthesia services in a deprived area particularly in low income countries is a major challenge all over the globe. Along with issues of manpower, logistics, services, there lies agendas of safety and accuracy while delivering the services. With rise in ultrasound use in regional anesthesia, pain and perioperative care, it is prudent that some of these issues can be addressed with proper training, mentoring and monitoring. The global idea needs to be implemented locally to reach out to huge volume of patients who are inadequately treated for the various painful conditions. A group of regional enthusiasts from Nepal takes the vision and mission in Nepalese context to address the issues.

Keywords: Low income country; rural anesthesia; safety; ultrasound guided regional anesthesia

INTRODUCTION

It's a known fact that anesthesiology services in terms of trained human resource, logistics, provision of regional anesthesia, critical care and emergency services are lacking in low income countries.¹ According to world federation of societies of anesthesiologist, anesthesia workforce survey, over 136,000 additional physician anesthesia providers would be needed immediately to achieve a minimum density of 5 per 100,000 population in all countries. Seventy seven countries reported physician anesthesia provider less than five with particularly low densities in South Asian and African regions.² Anesthesia standards and equipment as per the local context has been emphasized with partnership from global health experts. The role of regional anesthesia particularly in cesarean section and other common procedures has been increasingly discussed and recognized.³ Regional anesthesia provides a clear advantage in terms of avoidance of airway, good perioperative outcome compared to general anesthesia. Task sharing which involves the non-specialist has been recommended to bridge the gap to provide care at district level in

low resource countries however the issues of safety concerns, weak training modality, unclear career pathway, regulation issues and service underutilization still prevails.⁴ Minimum standard to safety requirement is a basic human right even in deprived set-ups.⁵ There has been lot of attempts to improve patient safety in deprived set-up and also improve the surgical access.^{6,7} Improving competency in use of ultrasound for anesthesia and analgesia delivery can help improve safety and address resource limitation issues and improve overall service delivery.⁸

As essential surgical and emergency services expand in low income country, the prevalence of chronic pain will be more demonstrated. Inadequately treated trauma, cancer, birth complications surgical diseases, congenital defects will lead to development of chronic pain.⁹ With ultrasound guided regional anesthesia, there is provision of more accuracy, less failure, less logistics, improves safety profiles and address pain management issues. Even during health camps, these features can be used by a properly trained anesthesiologist with accuracy and safety.

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EVIDENCES FOR ULTRASOUND GUIDED REGIONAL ANESTHESIA

The burden of surgical care in rural areas mostly lies while providing cesarean delivery, emergency trauma care, hernia surgeries and at the time of surgical camps. The issues of adequate pain management during the postoperative period is overlooked mostly during this period. There are good evidence even in pediatric setup in rural areas where superficial blocks are safely performed with lesser analgesic requirements.¹⁰ Ultrasound guided Transverse Abdominis plane block can provide superior alternatives for management of small and medium sized hernia performed with local anesthesia,¹¹ postoperative pain management as multimodal approach for cesarean section¹² which also help improve mother recovery, satisfaction and breast feeding. Upper extremity block for orthopedic surgery has good evidence in terms of safety profiles, accuracy and patient satisfaction.¹³ Use of adjuncts for prolonging analgesia can be other dimensions to look in this setup in case of prolonged surgery and postoperative analgesia.¹⁴

Single shot technique can provide good analgesia intraoperatively, reduce opioids requirements, improve the discharge scores. Use of continuous catheter technique is yet to be evaluated and evidence are scare in rural set-ups.¹⁵ Femoral nerve block can be a successful addition for pain management during management and transfer of lower limb trauma victims.¹⁶ There are good evidence that ultrasound use in supraclavicular, axillary, interscalene block has good success rate, block quality and lesser complication rates. Sciatic and popliteal block also have better safety profile and success rates.¹⁷ Axillary brachial plexus among novice medical students was found to have better learning curve, higher success rate than nerve stimulation technique.¹⁸ Current evidences regarding ultrasound guided lower extremity block shows moderate improvement in performance time, comfort at the time of procedure, onset time compared to other conventional localization techniques,¹⁹ however parasacral sciatic nerve block, popliteal nerve block, obturator nerve block and ankle block are still a useful addition while working in resource deprived set-up. Addition of more services will again depend upon the need of the patients, interest of the provider.

FUTURE DIRECTIVES

Providing regional anesthesia services in these areas needs to have a multidimensional approach. It requires good training, regular follow-up, monitoring and mentoring. At the same time team needs to be identified, dedicated for providing regional anesthesia

services. The role of trained pain nurses, paramedical staffs, along with understanding of operation theatre staff is very important in this regard. Anesthesiologist involved in providing services needs to deliver regular services, develop a routine mechanism for establishing care. Early days may be cumbersome as surgeons may find it time consuming and unreliable however outcome will be evident later as the accuracy increases and the incidences of postoperative pain, patient satisfaction begins to improve.²⁰ Mechanism of recording and reporting is utmost as it provides good feedback, room for improvement and contribute to research and development.

NEPALESE CONTEXT

The history of development of anesthesia is very recent for Nepal. In 1984, there were only seven trained anesthesiologists with mentioning of providing spinal anesthesia. The challenge for developing acute and chronic pain services are still same, with some tertiary institution starting to use ultrasound for providing pain services more for perioperative care.²⁰ There is no evidence yet to assess the burden of pain in the population as the country is still fighting to establish proper surgical and anesthesia services away from the center.

The founding of Ultrasound guided regional anesthesia foundation Nepal (URAN) has started a new era of using ultrasound for acute and chronic pain patients in the country. A group of regional anesthesia enthusiasts from different institution across the country takes the initiative to develop the specialty and have already conducted numerous training in the center and periphery of the country. The goal seems clear to reach the many more patients and address issues of upgrading pain services by training anesthesiologist and healthcare provider.²² With more development, ultrasound guided regional anesthesia needs to be part of the curriculum in anesthesiology residency, part of the regular work. Regional anesthesia and pain needs to established as a specialty to allow room for more anesthesiologist to grow and reach the periphery of the country and address issues of pain.

CONCLUSIONS

Ultrasound guided regional block can provide options in deprived setup where the burden of pain due to expanding surgical services are underestimated and overlooked. A team approach is required along with proper mentoring and supervision to develop the services and skills of the provider which will help address issues of safety and improve perioperative experience of the patients.

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