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EDITORIAL VIEW CARDIAC ANESTHESIA

Cardiac anesthesia provision in Pakistan; Challenges and a way forward

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ABSTRACT

Global cardiac surgery has a number of opportunities as well as obstacles. In the developed countries many of the cardiac surgical procedures are being performed with the help of robots. Despite much advancements in cardiac surgery services in Low-Middle Income Countries (LMICs) are still viewed with suspicion. Although there has been an increasing focus on expanding surgical services globally in every surgical and anesthetic specialties, the progress in worldwide cardiac surgery is still delayed, particularly in LMICs where the development of cardiovascular care is most required. This editorial aim is to highlight this important short-coming with a hope that the concerned authorities will notice it and plan to enhance the facilities.

Keywords: Anesthesia; Cardiac Anesthesia; Cardiac Surgery; LMICs

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Anesthesia is still seen as a "hidden" speciality and the public is not sufficiently aware of its significance in the delivery of healthcare, despite notable improvements in anesthetic quality and procedures as well as higher surgical success rates.[1] Traditional intraoperative techniques are still the only way to provide anesthesia in Pakistan. While cardiac surgery is still a low priority on the global public health and surgery agenda, and six billion people in low-middle-income countries (LMICs) do not have timely or accessible access to safe and economical cardiac surgical care when needed.[2]

One of the subspecialties that is most frequently overlooked is global cardiac surgery.[2] It is taught to cardiac anesthesiologists how heart disease and other factors affect blood pressure and the heart, which makes cardiac anesthesia difficult. Meanwhile, a large portion of the disregard believed to result from the perception that heart surgery is difficult to implement in low-resource environments due to its intricate follow-up, requiring extensive training of human resources, and requiring capital funding to establish a cardiovascular service that is widely accessible and sustainable.[2] Cardiac anesthesiologists keep an eye on blood pressure, oxygen levels, heart rhythm, and heart function to preserve hemodynamic stability, avoid ischemia, and facilitate a speedy recovery from cardiopulmonary bypass (CPB). Transesophageal monitoring, pain management, and critical care are all part of the complete treatment they offer during the peri-operative period.[1]

From its beginning, cardiac anesthesia has developed into a subspeciality group with distinct knowledge, abilities, and training for a variable period after the generalized training in anesthesia. Cardiothoracic anesthesiology is focused on the preoperative, intraoperative, and postoperative management of both adult and pediatric patients undergoing cardiothoracic surgery and associated invasive procedures.[3] There have been several significant developments in the field of cardiac anesthesia in the recent years, aided by technological advancements such as artificial intelligence (AI), innovative equipment, procedures, imaging, pain management, and a better understanding of the pathophysiology of the disease states. With all of these factors, cardiac anesthesia has undergone a rapid evolution over the past several decades. Although these developments have made it possible to provide better treatment to the high-risk patients—including those with serious comorbidities, many LMICs are unable to make headway due to a lack of access to state-of-the-art tools, skilled workers, and research opportunities.[3]

Globally, the specialty has emphasized the importance of perioperative hemodynamic management and the incorporation of sophisticated monitoring tools to improve patient outcomes. The transition to minimally invasive and hybrid cardiac procedures has further increased the complexity of anesthetic management, necessitating higher levels of skill and expertise.[4] Patient outcomes in terms of morbidity and mortality benefits have improved because of its incorporation. Reduced opioid dosages, ultrasound-guided regional anesthesia for pain management, and less invasive surgical techniques have all contributed to improved recovery following heart surgery.[3]

Given the intricacy of cardiovascular disorders, which include a lengthy list of cardiovascular and anesthetic medications and procedures, as well as different monitoring systems and management protocols, Cardiac anesthesia is a quickly growing subspeciality that presents difficulties for both novices and seasoned professionals.3 Because of their wide range of responsibilities, cardiac anesthesiologists must be knowledgeable in internal medicine, critical care medicine, cardiology, pharmacology, physiology, and cardiac surgery. Comprehensive knowledge and expertise in respiratory treatment, mechanical ventilation, airway management, and cardiopulmonary resuscitation (including post resuscitation care) are essential for cardiac anesthesiologists. Critically sick patients in cardiogenic shock are also usually under their care, since they may need sophisticated support systems including extracorporeal membrane oxygenation (ECMO), left ventricular assist devices, and intra-aortic balloon pumps.[3]

Three issues emerged from a research as major challenges within the speciality: differences between specialities, quality of treatment and in-service training, and recruiting and retaining anesthetists.[4] Cardiothoracic anesthesia is a dynamic subspecialty that requires continuous adaptation to technological advancements and surgical innovations. However, it is not without significant challenges, particularly in resource-constrained environments like Pakistan. It's estimated that 93% of individuals in low- and middle-income countries (LMICs), which amounts to around 6 billion people globally, do not have access to heart surgery when it's necessary.[2] The problems associated with cardiac anesthesia in low- and middle-income countries (LMICs) are closely linked to structural deficiencies in funding, infrastructure, and manpower.[5]

The significant lack of nurses, intensivists, and specialized anesthesiologists qualified to handle the complications of heart surgery is a major obstacle. LMICs frequently lack even basic anesthesia providers, let alone those with experience in cardiac operations, while high-income nations enjoy the advantages of dense, specialized anesthesia teams. This shortage is made worse by restricted access to crucial drugs (such as vasodilators and inotropes), sophisticated monitoring equipment, and dependable sources of blood products or cardioplegia solutions, which are necessary to preserve hemodynamic stability during surgery.[2] The safety of patients and the success of procedures are further endangered by outdated or donated equipment, which is frequently inappropriate for local conditions.

Furthermore, the high expenses of anesthesia-related supplies and equipment put further strain on already tight budgets, causing many LMIC hospitals to either rely on unsustainable donor-driven models or restrict resources. Additionally, the absence of strong data systems and high-quality registries tailored to cardiac anesthesia makes it more difficult to monitor results, pinpoint areas in need of development, or promote focused funding. The scaling of safe, sustainable cardiac surgical treatment in LMICs will continue to be severely hampered by cardiac anesthesia until these interrelated issues—workforce training, infrastructure modernisation, and fair financing—are resolved.

A way forward

A cardiothoracic accredited program must provide education, training, and experience in an atmosphere of mutual respect between teachers and trainees so that they will be stimulated and prepared to apply acquired knowledge and talents independently. This program promotes the acquisition of knowledge, skills, clinical judgment, and attitude essential to the practice of Cardiothoracic anesthesiology. Addressing these issues requires a multidisciplinary approach, emphasizing education, collaboration, and innovation tailored to the specific needs of the region.

In order to address cardiac anesthesia issues in LMICs, infrastructure, personnel training, and long-term funding must be invested in. One way to lessen labour shortages is to increase specialised training programs, task-sharing schemes, and multinational collaborations. Operational safety requires bolstering supply networks for standardised equipment, blood products, and necessary drugs. Government assistance and public-private partnerships are examples of sustainable funding approaches that might lessen need on donor-driven initiatives. Setting up data systems and quality registries can also help direct resource allocation and enhance patient outcomes. In the absence of these initiatives, cardiac anesthesia will continue to be a significant obstacle to the expansion of safe cardiac surgery in LMICs.[3]

However, research is needed on why fewer medical professionals opt for this demanding speciality and why skilled anesthesiologists continue to emigrate from Pakistan. Data on cardiac anesthesiology in Pakistan is lacking and no research has highlighted anesthesiologists perceived challenges.

Conflict of interest

None declared by the authors.

Author's contribution

Both authors took part in the concept, research and manuscript drafting.

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