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Letter to the Editor: Awake craniotomies in South America: Advancements, challenges, and future prospects

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To the Editor

There have been global estimates of around 22.6 million people suffering from diseases and injuries that require neurosurgical care yearly, and 5 million without access to required neurosurgical treatment due to several socioeconomic factors.[1] Awake craniotomy (AC) has progressively become a common neurosurgical procedure used in complex cases to perform real-time mapping of eloquent brain areas to maximize lesion resection while minimizing postoperative neurological complications; thus reducing intensive care unit (ICU) costs.[2] This procedure is cost-effective, and beneficial for low-to-middle-income countries (LMIC).[1] Being from Colombia, a South American LMIC we read with great interest the recent article by Bharadwaj et al.[3] regarding ACs in South America.

Even with advantages including cost-efficiency, patient satisfaction, and reduced costs, AC has faced several barriers hindering its widespread use in LMIC settings.[3] Colombia is an upper-middle-income country located in South America with 48.7 million people of which 28% live below the poverty line.[4] It is recognized as an LMIC, yet AC has been increasingly practiced. A recent study published by a Colombian research group in collaboration with other countries such as Mexico, Brazil, Argentina, and USA demonstrated a total of 259 patients who underwent AC in Latin America up to 2023.[2] In this study AC is recognized as a complex procedure requiring the use of brain mapping, specific anesthetics, a highly trained team and infrastructure; all limited due to socioeconomic and accessibility barriers.[2] Nonetheless a similar article based in Africa described how constraints in human resources have resulted in AC programs with minimum staff with intraoperative evaluation carried out by either the surgical or anesthesia teams proposing alternatives for education goals and knowledge transfer.[1] Institutions such as the Colombian Journal of Anesthesiology have published literature specifying indications, benefits, and techniques for the adequate practice of ACs.[5] Case series of patients treated with AC have been published by Latin America surgical groups since 2001.[6]

In the previously cited study by Figueredo et al., it was found that most ACs were carried out in centers with academic affiliation, 85% of them performing preoperative neuropsychological tests and intraoperative stimulation.[2] As found in literature and used in daily practice, tools such as the Boston Naming Test have been used to adequately test language and speech areas successfully.[5] Nonetheless, relying solely on preoperative clinical information to determine eloquent areas has been associated with significant morbidity, which is why imaging techniques like diffusion tensor tractography (DTT) when available are highly useful for surgical planning.[1,7] DTT has been proved useful to estimate fiber tracts indirectly, allowing for the surgical team to plan safe surgical approaches, estimate the extent of resection, and anticipate the need for electrical stimulation.[1,7,8] Although costly, these tools are available in several high-care institutions in Latin America.

On the other hand, another main limitation for ACs in LMIC is the lack of reliable burden of disease data and research which have hindered the capacity to improve public policy and prioritize essential neurosurgical training in a limited resources context.[2] A wide disparity between published neurosurgical papers in HIC in comparison to LMIC has been previously described.[9] Among ACs carried out in Latin America, most institutions were either academic hospitals or had an academic link.[2] Research opportunities and initiatives are required on a national and regional basis, to help characterize epidemiologic trends to better understand the applicability opportunities for ACs. Furthermore, promoting research could help in the training and diffusion of knowledge to educate other professionals in ACs.

When looking at patient outcomes in AC, reduced infection and complications rate has been described, as well as increased patient satisfaction.[2] Shortened neuro-ICU and hospital stay, and faster going back to work times contribute to these.[1,2] Furthermore, in AC the reduced use of general anesthesia has shown lower ICU requirement due to postoperative complications, as well as fewer postoperative neurological deficits.[1] Overall, patient outcomes are highly promising when evaluating long-term care, functionality, and costs.

Bharadwaj and colleagues' study elucidates the promising future of AC in South America and neurosurgical care,

nonetheless with significant challenges identified for its widespread use.[3] We congratulate the authors on their work and encourage authors of future studies, especially those in LMIC to continue researching and learning safe AC practices. This to continue developing and using AC as a valuable tool for better patient outcomes, safer surgical resections, and in the long-term lower costs associated.

Author contributions

Alexandra Ramos: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing, Diego Fernando Gomez: Conceptualization, Project administration, Supervision, Validation, Visualization, Fernando Hakim: Conceptualization, Project administration, Supervision, Validation, Visualization, Edgar Gerardo Ordonez: Conceptualization, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

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Appendix

Abbreviations

AC	Awake craniotomy
ICU	intensive care unit
LMIC	low-and middle-income countries
HIC	high-income countries

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