SPECIAL COMMUNICATION

The need for economic evaluations for neuro-oncology in low- and middle-income: the Pakistan perspective

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Abstract

The incidence and prevalence of brain tumours have steadily increased within low- and middle-income countries, similar to patterns seen in high-income countries. In addition to the epidemiological landscape of brain tumours in Pakistan, it is important to consider the economics of brain tumour diagnosis and management to inform policy on neuro-oncological healthcare service delivery. The challenges associated with conducting economic evaluations in LMICs include the ability to receive funding for country-specific estimates, dearth of existing data and methodological development, and the need for investment in economic evaluations of health. Economic evaluations are most useful when funding support is given to country-specific initiatives to allocate resources. Cost and cost components must also be meticulously collected to enable accurate calculations of economic evidence for the decision-making process. To put neuro-oncological care at the forefront of the national health agenda, it is crucial for vigorous epidemiological and economic evidence to be available for policymakers.

Keywords: Incidence, Health Care, Brain Neoplasms, epidemiology.

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Introduction

The incidence and prevalence of brain tumour has steadily increased within low- and middle-income countries (LMICs), similar to patterns seen in high-income countries (HICs).[1] This is due to the shift in the epidemiology of the disease from an acute illness to a chronic condition, as a result of improved diagnostic and therapeutic methods.[2] However, the prolonged nature of brain tumour treatment, which can span months to years, coupled with the need for regular follow-up care, has led to a rise in treatment costs. While HICs can afford to invest in new technologies and innovative treatments, LMICs must focus on implementing standardised care protocols for brain tumour treatment in low-resource settings. This requires targetted policy that addresses issues in the healthcare pipeline which impede the care of brain tumour patients.

Policy formulation often begins with epidemiological data to determine the burden of disease and scope of the problem. The Pakistan Society of Neuro-oncology (PASNO) and the Aga Khan University's Centre of Global Surgical Care (CGSC) conducted a nationwide cross-sectional study to assess brain tumour distribution in Pakistan, known as the Pakistan brain tumour epidemiology study (PBTES).[3] The purpose of this study was to establish the current epidemiological landscape of brain tumours in Pakistan and analyse distribution according to various factors affecting brain tumour care across the healthcare spectrum. This was the first study to quantify brain tumour burden at the national level and can provide direction for future cancer surveillance efforts in both the epidemiological and molecular fields.

In addition to the epidemiological landscape of brain tumours in Pakistan, it is important to consider the economics of brain tumour diagnosis and management to inform policy on neuro-oncological healthcare service delivery. Economic evaluations are a crucial part of the decision-making process in the healthcare. They help policymakers, healthcare providers, and other stakeholders to determine the most efficient and cost-effective ways to allocate resources to improve population health.[4] A systematic literature search for economic evaluations of various aspects of brain tumour care identified only two of the 85 articles as being from LMICs, and one of these was from South Asia. This indicates a need to explore costs, cost-effectiveness and quality of life for brain tumour patients in country-specific contexts in order to mobilize political will to support neurological policy and health services (Figure 2).

However, conducting economic evaluations in resource-constrained areas comes with challenges and limitations.[5]

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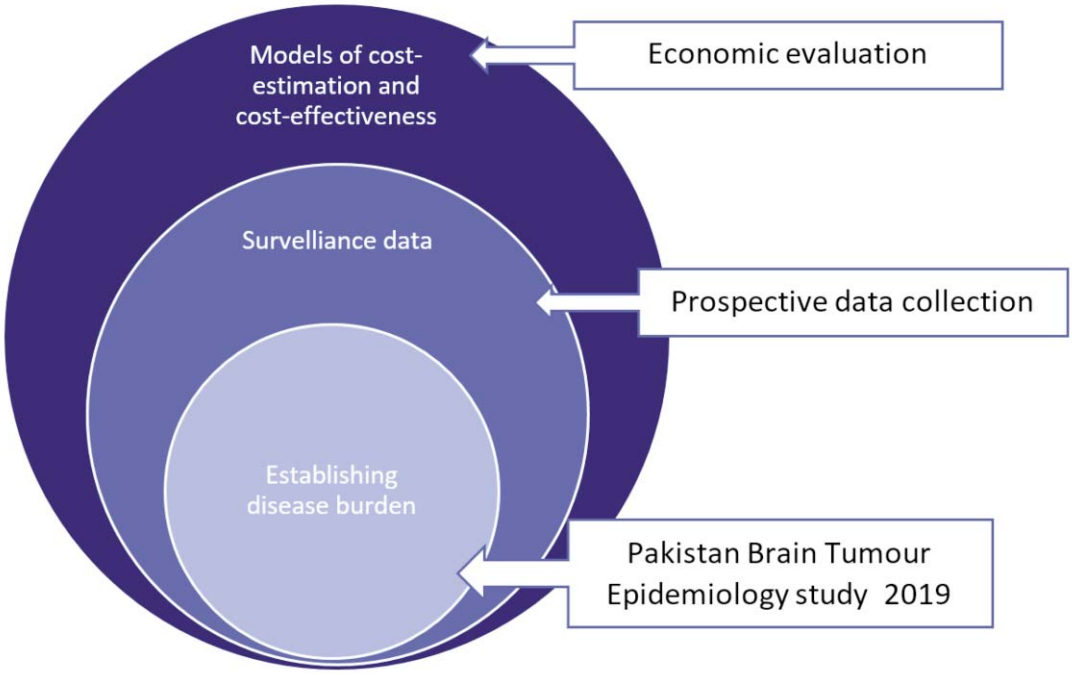

Figure-1: Health Policy Decision-making Components in Pakistan.

Pitt et al. identified these challenges as the ability to receive funding for country-specific estimates, dearth of existing data and methodological development, and the need for investment in economic evaluations of health.[6]

Prioritizing funding support

Economic evaluations of health have been shown to improve health outcomes, establish practice guidelines, and develop public reimbursement lists and negotiate prices.[7] This evidence is lacking in many LMICs, including Pakistan. Furthermore, non-communicable diseases, such as cancer, were historically ranked low on the global health agenda for many years, while, in LMICs, maternal and child health and infectious disease were often prioritised in deliberative priority setting exercises, resulting in greater attention from funding agencies worldwide.[8] Additionally, funding agencies tend to finance regional or multi-country studies, which result in generalised estimates.[6] For economic evaluations to be useful in policymaking, it is essential that burden of disease, costs, and cost-effectiveness data are all collected in the local context in which they will be used to allocate resources.

Evidence gaps and Mmethodological development and investment

In high-income countries, robust health information systems allow for costing and cost-effectiveness studies of various conditions and treatment strategies. From a provider perspective, direct costs for brain tumour care in the United States have been categorised as: craniotomy costs alone, post-operative radiotherapy costs alone, craniotomy followed by radiotherapy costs, standard of care treatment costs, disease first recurrence after treatment costs, and adjunctive therapy costs.[9] Costs from a patient perspective found in a cost-of-illness study in Sweden indicated that the direct costs for brain tumour care involved ambulatory care, hospital care, long-term and home care, and drugs. Ambulatory and hospital care can further be broken down into diagnostic radiology, major surgery, radiation therapy costs.[10] It is important to also examine indirect costs such as loss of productivity for the individual and loss of productivity by caregivers and informal care costs. Indirect costs to the patient and patient's household included sick leave, retirement, and mortality.[10] Many of the costs and cost components associated with brain tumour care have been determined by HICs; it is important for LMICs such as Pakistan to determine our own costs and effectiveness, along with our disease burden, to be able to adequately prioritise interventions for brain tumour treatment and management. Using the cost components from HICs as a guide, it is important for Pakistan to create its own costs database. Health systems constraints associated with limited financial data must be mitigated in order to successfully carry out economic evaluations for decision making.

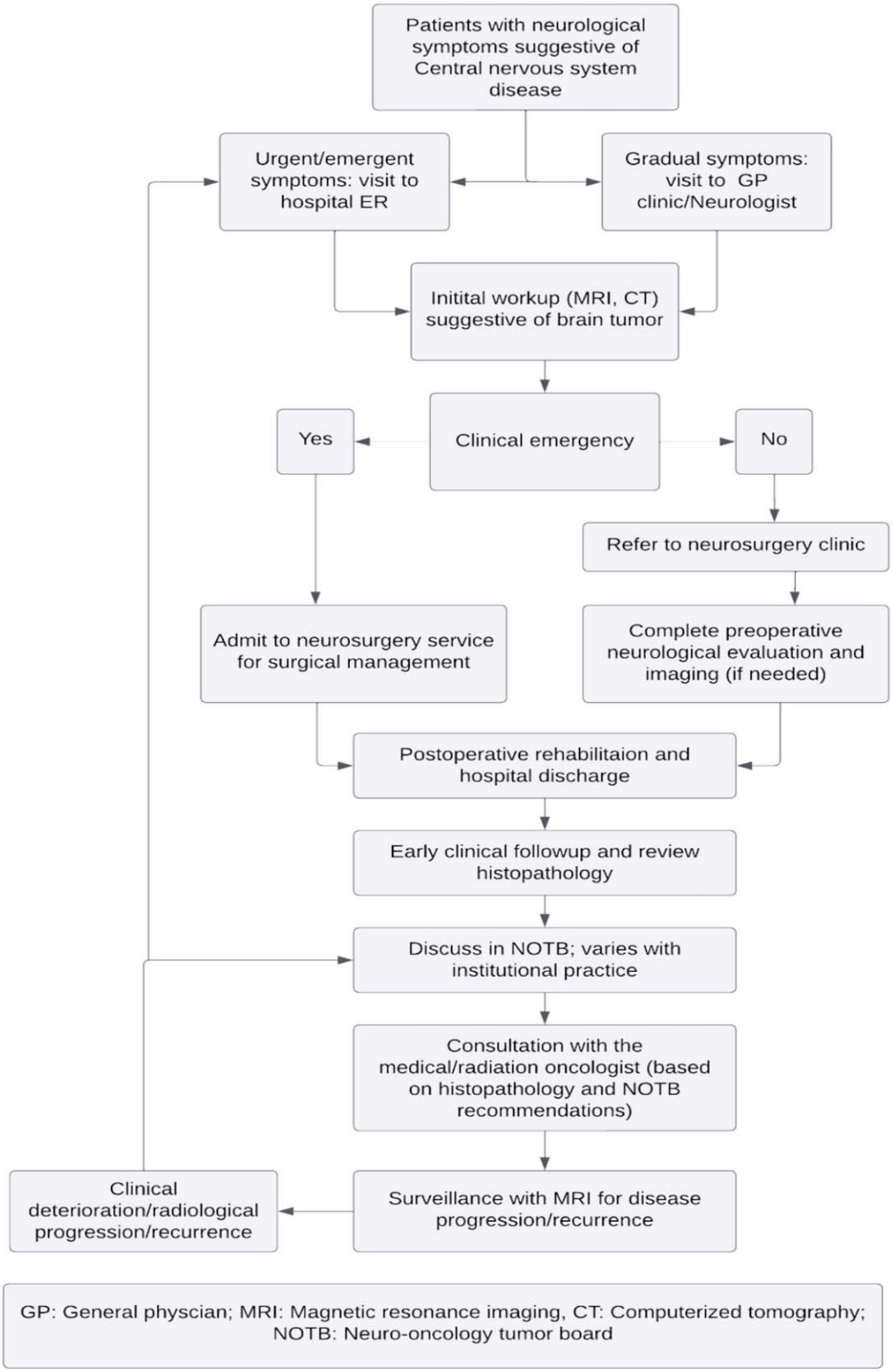

Figure-2: Proposed Brain Tumour Care Pathway in Pakistan..

While Pakistan has shown commitment to moving towards universal health coverage, the existing health system is a mix of public and private sector facilities that provide neuro-oncological care. Therefore, both government and societal perspectives need to be considered. In Pakistan, 56.24% of all health expenditure is paid out-of-pocket.[11] This, along with the productivity loss associated with brain tumour treatment and management, results in a high cost-of-illness for brain tumours. It is important to conduct studies which assess, and subsequently implement programmes that can provide protection against financial risk. Without accurate, country-specific data, economic evaluations cannot be efficiently used for decision-making and priority setting in health.

Carrying out an economic evaluation in Pakistan for brain tumours: the way forward

While economic evaluations of brain tumour care in LMICs are rare, they are not unheard of. In Vietnam, a cost-effectiveness analysis of stereotactic radiosurgery versus surgical resection was carried out.[12] To determine costs, both direct and indirect costs were calculated. Out-of-pocket spending percentages were taken from national estimates, and average costs for travel and accommodation were used. Assumptions were made for the number of caregivers and the productivity loss associated with taking time off from work and/or school. For the effectiveness analysis, survival time was considered as the primary outcome, and the mean survival time was used in their calculations.

Cost-effectiveness analyses, and other economic evaluations, can be similarly executed in Pakistan, despite the health systems constraints associated with neuro-oncological care. This has been demonstrated by an economic evaluation that was carried out for neurovascular disease intervention in 2009.[13] Out-of-pocket spending is typically well-documented in private health facilities, which can be used to calculate patient perspective costs. In public hospitals, which are nominally free at the point of care, hospital costs can be used to estimate provider costs, whereas patient spending on consumables must also be considered for the societal perspective. Often, public hospitals do not keep meticulous records of their budgets for specific disease management. While this is a process that will require time to effectively implement, starting with policy to consistently documented financial data is the first step to accurately estimate cost-of-illness and cost-effectiveness to further draft policy on streamlining neuro-oncological care. Financial data can also be estimated from various stages of the brain tumour care pathway. Figure 2 outlines the care pathway in Pakistan; cost components in Pakistan include imaging and diagnosis, surgery costs, initial, preoperative and follow-up clinic visits, postoperative home care and adjuvant chemoradiation.

Effectiveness data, while crucial, may be more difficult to obtain. Like in many LMICs, public hospitals in Pakistan are not recorded in a consistent, standardised manner. The Centre of Global Surgical Care at the Aga Khan University, Pakistan is promoting a culture of robust perioperative (including 30-day) mortality and morbidity as per the Lancet's Global Surgery Indicators.[14] To obtain accurate survival data for brain tumours to determine effectiveness, efforts must be made at provincial and national levels to instill centralised medical record keeping, which can help with both economic health policy and guideline development.

Conclusion

To put neuro-oncological care at the forefront of the national health agenda, it is crucial for vigorous epidemiological and economic evidence to be available for policymakers. By understanding the challenges to performing economic evaluations in LMICs, we can adapt methods to individual country contexts for decision-making and guideline development.

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