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Editorial Commentary

Central nervous system tumors: Spotlight on India

Tumors of the central nervous system (CNS) constitute 1–2% of all malignancies.[1] However, CNS malignancies arguably have the most varied manifestations among all cancer sites. There are several anatomical subregions in the craniospinal axis, and each of these has a predilection for a particular tumor subtype.[2] Further, each tumor can be subdivided into prognostic groups based on surgical resection extent, performance status, imaging findings, grade, age, and molecular characteristics.[3] Among CNS neoplasms, gliomas are the most common tumors.[1-3] In pediatric patients, both gliomas and medulloblastomas are common tumors. It is well known that geographical, genetic, and phenotype differences in populations can alter the incidence, natural history, behavior, and response to the treatment of cancers.[2-4]

Most of the data for evidence-based practice in oncology and neuro-oncology come from western data, which include clinical and basic science research work. There have been studies to test the suggestions that there are differences in epidemiological variables, clinical presentation, prognostic factors, and occasional behavior to therapy, when western patients are compared to their Indian counterparts.[5-7] As an example, western investigators have documented the presence of the JC viral (JCV) genome in a variety of brain tumors, particularly in medulloblastomas, gliomas, and ependymomas. However, in a study of 22 medulloblastoma patients, JCV antigens could not be detected by immunohistochemistry in the tumor tissues of Indian children with medulloblastomas.[6] The relevance of such findings needs to be further looked in.

To their credit, many Indian investigators have reported case series and retrospective analysis of several brain tumor types. A study aimed to clinicopathologically correlate 45 cases of brain stem gliomas and determine the occurrence and prognostic significance of p53 expression.[8] Forty-five cases of brain stem gliomas were encountered during a 19-year period. Thirty were diagnosed by surgical biopsy and fifteen at autopsy. Fifty-one percent of the gliomas were observed in the first decade of life. Improvement was noted in 20% of the patients postoperatively. p53 positivity was more in high-grade lesions, decreasing significantly in lower grade lesions. With contemporary studies worldwide reporting much improved survival outcomes for gliomas and medulloblastomas, current data from Indian centers about their respective outcomes need to be reported.

Some Indian investigators have reported the critical demographic data of cancer registries.[9] In the demographic data reported by Satyanarayana *et al*., age-adjusted cancer incidence rates ranged from 18.6/million to 159.6/million for boys and 11.3/million to 112.4/million for girls. Leukemia and lymphoma were the most common malignancies in boys whereas leukemia and brain tumors were most common in girls. The study concluded that childhood cancer incidence appears to be increasing in India. Another interesting demographic study assessed the trend in the incidence of primary malignant brain tumors that was noticed in orchard farmers and their families in Kashmir.[10] The authors compared case files along with death certificates of 432 patients of primary malignant brain tumors and 457 controls (nontumor neurologic diseases). The analysis revealed that 90.04% (389 out of 432) of the patients were orchard farm workers, orchard residents, and orchard playing children exposed to the high levels of multiple types of neurotoxic and carcinogenic chemicals for more than 10 years (relative risk = 10.6; odds ratio ≥10; 95% [confidence interval] ≥25–40).

Collation of data from Indian studies for gliomas and medulloblastomas as has been done in the present study by Dasgupta *et al*. is a commendable effort indeed.[11] Efforts such as these create a useful snapshot for researchers and clinicians working in the field of neuro-oncology. Such efforts can also result in cost-effective strategies of management based on local logistics and infrastructure.[12]

It needs to be conceded, however that most of the available Indian studies in neuro-oncology have been retrospective studies confirming the existing published western literature or simple epidemiological studies, although some recent emerging original data from Indian centers appear encouraging. The need of the hour, therefore, is to do original clinical and molecular research in Indian centers. Some efforts in this direction have already started and some are in the way. The authors themselves need to be complimented for doing such studies.[13]

India has launched a now famous "Make in India" campaign.[14] The bigger challenge is to "Think in India" leading to "Research in India," "Develop in India," and finally "Make in India," in all spheres of science including oncology. To summarize, it is time that India, projected to have the highest economic growth rate in 2016, also emerges as a hub for original medical and oncological (including neuro-oncological!) research. The rest, as they say, would follow.

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References

1. McLendon RE, Rosenblum MK, Darell D. Bigner Russell and Rubinstein's Pathology of Tumors of the Nervous System. 7th ed. New York: CRC Press; 2006. ISBN 9780340810071.
2. Wen PY, Kesari S. Malignant gliomas in adults. N Engl J Med 2008;359:492-507.
3. Thakkar JP, Dolecek TA, Horbinski C, Ostrom QT, Lightner DD, Barnholtz-Sloan JS, *et al.* Epidemiologic and molecular prognostic review of glioblastoma. Cancer Epidemiol Biomarkers Prev 2014;23:1985-96.
4. Schwartzbaum JA, Fisher JL, Aldape KD, Wrensch M. Epidemiology and molecular pathology of glioma. Nat Clin Pract Neurol 2006;2:494-503.
5. Ayub SG, Ayub T, Khan SN, Rasool S, Mahboob-ul-Hussain, Wani KA, *et al.* Epidemiological distribution and incidence of different cancers in Kashmir valley – 2002-2006. Asian Pac J Cancer Prev 2011;12:1867-72.
6. Vasishta RK, Pasricha N, Nath A, Sehgal S. The absence of JC virus antigens in Indian children with medulloblastomas. Indian J Pathol Microbiol 2009;52:42-5.
7. Ezzat S, Kamal M, El-Khateeb N, El-Beltagy M, Taha H, Refaat A, *et al.* Pediatric brain tumors in a low/middle income country: Does it differ from that in developed world? J Neurooncol 2016;126:371-6.
8. Badhe PB, Chauhan PP, Mehta NK. Brainstem gliomas – A clinicopathological study of 45 cases with p53 immunohistochemistry. Indian J Cancer 2004;41:170-4.
9. Satyanarayana L, Asthana S, Labani SP. Childhood cancer incidence in India: A review of population-based cancer registries. Indian Pediatr 2014;51:218-20.
10. Bhat AR, Wani MA, Kirmani AR. Brain cancer and pesticide relationship in orchard farmers of Kashmir. Indian J Occup Environ Med 2010;14:78-86.
11. Dasgupta A, Gupta T, Jalali R. Indian data on central nervous tumors: A summary of published work. The South Asian Journal of Cancer 2016;5:147-53.
12. Munshi A. Resource-sparing and cost-effective strategies in current

management of breast cancer. J Cancer Res Ther 2009;5:116-20.
13. Jalali R, Mallick I, Dutta D, Goswami S, Gupta T, Munshi A, *et al.* Factors influencing neurocognitive outcomes in young patients with benign and low-grade brain tumors treated with stereotactic conformal radiotherapy. Int J Radiat Oncol Biol Phys 2010;77:974-9.
14. Available from: http://www.makeinindia.com/home. [Last accessed on 2016 May 01].

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