

V.A.Pyatikop¹
M.A.Al-Trawneh¹
A.V.Buryan²
A.Yu.Gavryushkin³
A.E.Marchenko⁴
N.F.Posokhov⁵
V.P.Starenkiy⁶

¹ Kharkiv National Medical University

² Kharkiv regional clinical oncological center

³ Kharkiv City Clinical Hospital №7

⁴ Kharkiv Clinical Hospital of Railway Transport №1

⁵ State Institution "Institute of Neurology, Psychiatry and Narcology of the National Academy of Medical Sciences of Ukraine" Kharkiv, Ukraine

⁶ State Institution "Grigoriev Institute for Medical Radiology of National Academy of Medical Science of Ukraine", Kharkiv, Ukraine

Key words: brain, metastasis, neurosurgery, radiation therapy, chemotherapy, prognosis, treatment efficacy evaluation.

Received: 08.04.2016

Accepted: 19.05.2016

UDC 616.831-006-033.2-089.168.1-08

PROGNOSIS OF EFFICACY OF POST-OPERATION TREATMENT OF METASTATIC BRAIN TUMORS

ABSTRACT. Background. Metastatic affection of brain by its prevalence, medical and social importance, economical burden represents a topical medical problem in neurosurgery and adjacent medical specialties. **Objective** – optimization of prognosis for post-operation metastatic brain tumors treatment efficacy. **Methods.** An active cohort randomized research with retro- and prospective, cross-sectional and longitude components has been conducted in 176 patients, including 96 males and 80 females aged 56 years with adenocarcinoma (152), melanoblastoma (21) and sarcoma (3), derived from lungs (39), breast (34), skin (25) kidneys (9), digestive tract (11), ovary and uterus (by 4 each), thymus (2), nasopharynx, pronasus (by 1 each). Standard basic diagnostic and treatment procedures have been performed. P-level critical value was 0.05. **Results.** Discriminant models of post-operation tactics choice, prognostic algorithm of unfavorable outcome evaluation after treatment have been developed. The approbation of the algorithm allowed to state its sensitivity (69.2 %), specificity (95.2 %), positive predicting value (75.0 %), negative predicting value (93.7 %). **Conclusion.** For the purpose of widening of arsenal of available decision-making means for further treatment tactics in metastatic brain tumors after conducted neurosurgical treatment the use of developed discriminant models is recommended. The risk of unfavorable outcome and efficacy of combined treatment prognosis for patients with metastatic brain tumors are recommended to assess using the developed prognostic algorithm.

© V.A.Pyatikop, M.A.Al-Trawneh, A.V.Buryan, A.Yu.Gavryushkin, A.E.Marchenko, N.F.Posokhov, V.P.Starenkiy, 2015
✉ yanace_84@mail.ru

Citation:

Pyatikop VA, Al-Trawneh MA, Buryan AV, Gavryushkin AYu, Marchenko AE, Posokhov NF, Starenkiy VP. [Prognosis of efficacy of post-operation treatment of metastatic brain tumors]. *Morphologia*. 2016;10(2):69-76. Russian.

References

1. Reshetov IV, Zaytsev AM, Filonenko EV. [Follow-up of effective combined treatment of intracerebral metastases of ovary cancer]. Russian Oncological Journal. 2012;3:39-41. Russian.
2. Smolin AV, Konev AV, Nikolayeva SN et al. [Combined treatment of non-small cell lung cancer with metastasis into brain: possibilities of target therapy]. Pharmateca. 2011;7:58-66. Russian.
3. Ahluwalia MS, Vogelbaum MV, Chao ST, Mehta MM. Brain metastasis and treatment. F1000Prime Rep. 2014;6:114. doi: 10.12703/P6-114. PMCID: PMC4251415.
4. Nieder C, Marienhagen K, Dalhaug A, Aandahl G, Haukland E, Pawinski A. Impact of systemic treatment on survival after whole brain radiotherapy in patients with brain metastases. Med Oncol. 2014;31(4):927. doi: 10.1007/s12032-014-0927-2. PMID: 24647787.
5. Song WG, Wang YF, Wang RL, Qu YE, Zhang Z, Li GZ, Xiao Y, Fang F, Chen H. Therapeutic regimens and prognostic factors of brain metastatic cancers. Asian Pac J Cancer Prev. 2013;14(2):923-7. PMID: 23621262.
6. Pedachenko EG, Gryaznov AB [Radiosurgical treatment of big brain metastases]. Science and practice. 2014;1(2):87-93. Russian.
7. Sahgal A, Aoyama H, Kocher M, Neupane B, Collette S, Tago M, Shaw P, Beyene J, Chang EL. Phase 3 trials of stereotactic radiosurgery with or without whole-brain radiation therapy for 1 to 4 brain metastases: individual patient data meta-analysis. Int J Radiat Oncol Biol Phys. 2015;91(4):710-7. doi: 10.1016/j.ijrobp.2014.10.024. PMID: 25752382.
8. Shishkina LV, Pronin IN, Golanov AV. [The use of stereotactic radiosurgery on "gamma-knife" equipment in the treatment of intracerebral metastases of malignant extracranial tumors]. Zhurnal Voprosy Neurokhirurgii Imeni NN Burdenko. 2010;1:35-42. Russian.
9. Gryaznov AB, Zemskova OV. [Analysis of survival and prognostic factors in radiosurgical treatment on linac of skin melanoma metastases into brain]. Zbirnyk naukovykh prats spivrobotnykiv NMAPO imeni P L Shuypyka. 2014;23(1):125-39. Russian.
10. Bertolini F, Spallanzani A, Fontana A, Depenni R, Luppi G. Brain metastases: an overview. CNS Oncol. 2015;4(1):37-46. doi: 10.2217/cns.14.51. PMID: 25586424.

11. Zaytsev AM, Kurzhpov MI, Pikin OV, Kartoveshenko AS. [One-time surgery in lung cancer with metastatic affection of brain]. *Oncology*. 2013;5:49-52. Russian.
12. Fogarty GB, Hong A, Jacobsen KD, Reisse CH, Shivalingam B, Burmeister B, Haydu LE, Paton E, Thompson JF. Accrual to a randomised trial of adjuvant whole brain radiotherapy for treatment of melanoma brain metastases is feasible. *BMC Res Notes*. 2014;7:412. doi: 10.1186/1756-0500-7-412. PMID: 24981506.
13. Yamakawa Y, Moriguchi M, Aramaki T, Mitsuya K, Asakura K, Sawada A, Endo M, Nakasu Y. Brain metastasis from hepatocellular carcinoma: The impact of radiotherapy on control of intracranial hemorrhage *Hepatol Res*. 2015;45(11):1071-5. doi: 10.1111/hepr.12457. PMID: 25470452.
14. Slottje DF, Kim JH, Wang L, Raper DM, Shah AH, Bregy A, Furlong M, Madhavan K, Lally BE, Komotar RJ. Adjuvant whole brain radiation following resection of brain metastases. *J Clin Neurosci*. 2013;20(6):771-5. doi: 10.1016/j.jocn.2012.09.026. PMID: 23632290
15. Siegel MB, Van Swearingen AE, Anders CK. Approaches for optimal drug development and clinical trial design for breast cancer brain metastasis. *Oncology (Williston Park)*. 2014;28(7):579, 584-5. PMID: 25144277.
16. Jandial R, Neman J, Chen MY. Therapeutic disruption of the blood brain barrier in metastasis. *Neurosurgery*. 2014;74(4):N11-2. doi: 10.1227/01.neu.0000445333.56165.a0. PMID: 24642987.
17. Suvorova YuV, Korytova LI, Zhabina RM, Meshechkin AV. [Regional chemioinfusion and radiation therapy in patients with breast cancer metastases to brain]. *Vestnik khirurgii imeni I I Grekova*. 2011;3:17-19. Russian.
18. Pyatikop VA, Kotlyarevskiy YuA, Kutovoy IA. [Preoperational embolization of vessels supplying primary brain tumors]. *Ukrainian Neurosurgical Journal*. 2012;3:14-19. Russian.
19. Wald A. *Sequential analysis* N.Y.: J. Wiley; 1947. 212 p.
20. Gubler EV. *Vychislitelnye metody analiza i raspoznavaniia patologicheskikh protsessov* [Calculating methods of analysis and recognition of pathologic processes]. Leningrad: Medicina; 1978. 294 p. Russian.
21. Genkin AA. *Biologicheskie aspekty kibernetiki* [Biological aspects of cybernetics]. Moscow; 1962. P. 231-233. Russian.