International Journal of Cell Science & Molecular Biology
ISSN: 2572-1100

Juniper Publishers
key to the Researchers

Mini Review
Volume 6 Issue 5 - December 2019
DOI: 10.19080/IJCSMB.2019.06.555696

Int J cell Sci & mol biol

Molecular Genetics of Meningiomas

Behzad Saberi*

Medical Research, Iran

Submission: December 04, 2019 **Published:** December 12, 2019

***Corresponding author:** Behzad Saberi, Medical Research, Esfahan, Iran

Keywords: Meningiomas, Molecular genetics, Neurofibromatosis

Mini Review

Meningiomas arise from arachnoid membrane of the brain and can be developed in various parts of the brain including skull base and rarely in the ventricular system [1]. They show a rising incidence with age. Most of the cases with neurofibromatosis type 2, develop meningiomas [2]. Neurofibromatosis type 2 gene mutations can be seen in about 60 percent of the cases with sporadic meningiomas [3], so neurofibromatosis type 2 gene mutation, is the most common gene alteration in meningiomas [4]. Neurofibromatosis type 2 tumor suppressor gene's location is on the arm of the 22q chromosome [5]. Immunoreactivity reduction or absence of merlin as the neurofibromatosis type 2 gene product, may also be seen in meningiomas [6]. 4.1B/DAL-1 protein is also detected to be involved in the pathogenesis of meningiomas [7]. In about 70 to 80 percent of meningiomas, 4.1B/DAL-1 loss of expression can be seen [8]. In about 70 percent of meningiomas, loss of heterozygosity which involves the 4.1B/DAL-1 region on 18p chromosome, has been detected [9]. Neurofibromatosis type 2 and 4.1B/DAL-1 genes inactivity, can be occurred in anaplastic, atypical and benign meningiomas. In the more malignant tumor forms, some other gene alterations have been detected which are linked to tumors progression. Gene alterations in CDKN2A, P14ARF, CDKN2B genes on 9p and allelic losses on chromosome arms 17q, 10q, 1p, 14q and 9p are related to this category [10-12]. Having knowledge about the molecular genetics of meningiomas, is of importance to understand their pathogenesis and also to find new treatment options for such tumors.

References

1. Mawrin C, Perry A (2010) Pathological classification and molecular genetics of meningiomas. J Neurooncol 99(3): 379-391.
2. Perry A (2006) Meningiomas. In: McLendon RE, Rosenblum MK, Bigner DD (Eds.), Russel and Rubinstein's Pathology of Tumors of the Nervous System, (7th edn), London, Hodder Arnold, pp. 427-474.
3. Wiemels J, Wrensch M, Claus EBJ (2010) Epidemiology and etiology of meningioma. Neurooncol 99(3): 307-314.
4. Perry A, Scheithauer BW, Stafford SL, Lohse CM, Wollan PC, et al. (1999) "Malignancy" in meningiomas: a clinicopathologic study of 116 patients, with grading implications. Cancer 85(9): 2046-2056.
5. Tirakotai W, Mennel HD, Celik I, Hellwig D, Bertalanffy H, et al. (2006) Secretory meningioma: immunohistochemical findings and evaluation of mast cell infiltration. Neurosurg Rev 29(1): 41-48.
6. Zorludemir S, Scheithauer BW, Hirose T, Van Houten C, Miller G, et al. (1995) Clear cell meningioma. A clinicopathologic study of a potentially aggressive variant of meningioma. Am J Surg Pathol 19(5): 493-505.
7. Perry A, Gutmann DH, Reifenberger G (2004) Molecular pathogenesis of meningiomas. J Neurooncol 70(2): 183-202.
8. Nakasu S, Fukami T, Jito J, Matsuda M (2005) Microscopic anatomy of the brain-meningioma interface. Brain Tumor Pathol 22(2): 53-57.
9. Barresi V, Caffo M, Branca G, Caltabiano R, Tuccari G (2012) Meningeal tumors histologically mimicking meningioma. Pathol Res Pract 208(10): 567-577.
10. Perry A, Chicoine MR, Filiput E, Miller JP, Cross DT (2001) Clinicopathologic assessment and grading of embolized meningiomas: a correlative study of 64 patients. Cancer 92(3): 701-711.
11. Burger PC, Scheithauer BW, Vogel FS (2002) Meningioma. Surgical Pathology of the Nervous System and Its Coverings, (4th edn), Philadelphia, Churchill Livingstone, pp. 49-71.
12. Perry A, Stafford SL, Scheithauer BW, Suman VJ, Lohse CM (1997) Meningioma grading: an analysis of histologic parameters. Am J Surg Pathol 21(12): 1455-1465.

DOI: 10.19080/IJCSMB.2019.06.555696

How to cite this article: Behzad Saberi. Molecular Genetics of Meningiomas. Int J Cell Sci & Mol Biol. 2019; 6(5): 555696. DOI: 10.19080/IJCSMB.2019.06.555696