Multiple Sclerosis after Primary Central Nervous System Cancer in Mexican Population.

European Charcot Foundation

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Background

The pathogenesis of multiple sclerosis (MS) is multifactorial, being controversial whether there is a relationship between this disease and primary central nervous system (CNS) cancer, bidirectionally.

However, there is also the tendency (even rarer) to develop MS after the diagnosis of brain cancer, so the study of patients with this characteristic in a **third level Mexican medical center** for the first time was considered.

Methods

We performed an observational, analytic, retrospective, case-control study at Neurology service of Speciality Hospital of National Medical Center “Siglo XXI”, in Mexico City, Mexico.

- All patients whom got MS diagnosis by McDonald diagnosis criteria and cancer were include.
- Patients were divided in two groups: cancer diagnosis before MS diagnosis and cancer diagnosis after MS diagnosis.

Information was extracted from medical records **since January 2015 to June 2020,** and from the neuroimaging platform.

Our list includes specific type of brain cancer, treatment used, gender, history of MS in a first-degree relative and smoking, dividing cancer type in two groups:

- primary CNS cancer (PCNSC) and other cancer (OC).

Results

17 patients with concomitant diagnosis of MS and cancer were included.

- 11 (64.7%) developed MS after cancer diagnosis,
- 6 (35.2%) developed cancer after MS diagnosis.

From the first group, 2 (18.1%) got PCNSC, and from the second group 5 (83.3%).

Risk factor	OR	95% CI	P value
MS after PCNSC	22.5	1.60-314.57	0.034
MS after PCNSC Being male	0.75	0.42-1.32	0.66
MS after PCNSC Age at diagnosis > 35 y	0.75	0.42-1.32	0.66
MS after PCNSC Smoking index > 400	0.75	0.42-1.32	0.66
MS after PCNSC Familiar members with MS	0.75	0.42-1.32	0.66
MS after PCNSC Recipe concomitant CT	0.75	0.42-1.32	0.66

Table 1. Odds ratio, confident interval and, p value for getting MS diagnosis after PCNSC and analysis of PCNSC subgroup risk factors

The mean of age of diagnosis of MS was 35 years (SD 15).

The Odds Ratio (OR) for getting MS diagnosis after PCNSC was 22.5 with 95% confident interval 1.60-314.57 (p value 0.034).

Discussion

We found that **PCNSC by itself is a risk factor for the development of MS.** However, when evaluating each of the factors individually, they do not appear to be causally related to the development of MS after brain cancer.

A recent study reported that MS patients have a decreased overall risk of cancer, but an increased risk of brain tumor. Whether immunosuppressive treatment for MS could promote carcinogenesis is still up for debate.

However, there is also the tendency, even rare, to develop MS after the diagnosis of brain cancer.

Conclusions

- **PCNSC is a risk factor for the development of MS.**
- This study is **the basis for considering that in patients with brain cancer** and the risk factors discussed, the possibility of presenting demyelination in relation to MS exists, therefore being a fact to consider in the follow-up of these patients in the medium and long term.

References

1. Plantone, D., Renna, R., Sbardella, E., & Koudriavtseva, T. Concurrence of multiple sclerosis and brain tumors. Frontiers in Neurology, 2015;6, 40.
2. Handel, A. E., & Ramagopalan, S. V. Multiple sclerosis and risk of cancer: a meta-analysis. Journal of Neurology, Neurosurgery, and Psychiatry, 2010;81(12), 1413–1414. https://doi.org/10.1136/jnnp.2009.195776
3. Bertado-Cortés, B, Villamil-Osorio L Carrera-Pineda R, Martínez-Cortés C, Guerrero-Cantera J. Características clínicas y demográficas de los pacientes con esclerosis multiple. Rev Med Inst Mex Seguro Soc. 2016;54 Supl 2:S186-90
4. Abrishamchi, F., & Khorvash, F. Coexistence of Multiple Sclerosis and Brain Tumor: An Uncommon Diagnostic Challenge. Advanced Biomedical Research, 2017;6, 01.
5. Wang, Z., Xie, J., Wu, C., & Xiao, G. Correlation Between Smoking and Passive Smoking with Multiple Sclerosis and the Underlying Molecular Mechanisms. Medical science monitor: international Medical Journal of Experimental and Clinical Research, 2019; 25, 893–902.

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