

Psychiatric Disease Preceding Intracranial Tumor Diagnosis

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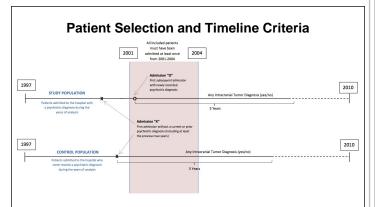


Introduction

The relationship between pre-existing psychiatric disease and intracranial tumors remains poorly understood; while various theories have been posited to explain potential associations between the two, [1,2,3], none have been uniformly accepted. In this context, we examined rates of intracranial tumor diagnoses in patients with and without pre-existing comorbid psychiatric diagnoses to better understand this relationship.

Methods

We used a longitudinal version of the California Office of Statewide Health Planning and Development (OSHPD) database (1995-2010). We examined all patients ages 18 -95 with confirmed hospital admissions between 2001 and 2004 (inclusive). Patients admitted before 1997, or initially admitted with a psychiatric or intracranial tumor diagnosis, were excluded. The primary outcome was the diagnosis of an intracranial tumor on any subsequent hospitalization within 5 years of first admission of interest. Rates of tumor incidence were compared for patients with and without depression, anxiety, bipolar disorder, and schizophrenia. Analysis was carried out via Cox proportional hazard modeling adjusting for age, gender, race/ethnicity, and comorbidity burden on first admission of interest. Subset analyses were performed for different tumor types.



Study population = admitted patients with a new psychiatric diagnosis. Control population = admitted patients who were never found to carry psychiatric diagnosis. Study population was followed forward in time from index admission (Admission "O") for up to 5 years. Control population was followed forward in time from index admission (Admission "X") for up to 5 years. Excluded = psychiatric diagnosis on index admission.

Baseline Demographic Data for All Cohorts

Patient cohort, N (%)	All patients 4,448,661 (100)	Depression 395,646 (8.9)	Anxiety 170,212 (3.8)	Bipolar Disorder 44,004 (1.0)	Schizophrenia 33,151 (0.8)
Age, mean (SD)	48 (20.8)	63 (19.1)	64 (17.7)	44 (16.5)	46 (17.7)
Gender, N (%):					
- Male	1,581,081 (35.5)	139,918 (35.4)	53,629 (31.5)	16,476 (37.4)	17,017 (51.3)
- Female	2,867,580 (64.5)	255,728 (64.6)	116,583 (68.5)	27,528 (62.6)	16,134 (48.7)
Race/Ethnicity, N (%)					
- White	2,516,134 (56.6)	253,791 (64.2)	109,112 (64.1)	26,341 (59.9)	13,689 (41.3)
- Black	318,201 (7.1)	30,044 (7.6)	11,160 (6.6)	4,656 (10.6)	6,735 (20.3)
- Hispanic	459,399 (10.3)	13,936 (3.5)	6,572 (3.9)	870 (2.0)	908 (2.7)
- Asian	394,100 (8.9)	17,187 (4.3)	7,398 (4.3)	1,263 (2.8)	1,593 (4.8)
- Other	760,827 (17.1)	80,688 (20.4)	35,970 (21.1)	10,874 (24.7)	10,226 (30.9)
Charlson Comorbidity					
Score on index	0 (2.3)	1 (2.2)	1 (2.0)	0 (1.7)	1 (1.8)
admission, median (SD)	, ,				, ,
[†] Baseline demograph		its, as well as for	each psychiatric c	ohort of interest.	N = number

of patients; SD = standard deviation

Results

The risk for diagnosis of an intracranial tumor within five years of the index admission, as determined by the hazard ratio, was highest for patients with a pre-existing diagnosis of bipolar disorder (HR = 1.53, 95%CI: 1.21-1.95 relative to no bipolar disorder), followed by anxiety (HR = 1.44, 95%CI: 1.30-1.61 relative to no anxiety), and then depression (HR = 1.29, 95%CI: 1.12-1.30 relative to no depression). Specifically, this risk remained significant only for primary benign brain neoplasm or meningioma diagnosis amongst depressed patients, and meningioma alone amongst anxious, bipolar, or schizophrenic patients.

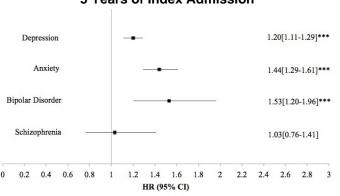
Conclusions

Patients admitted with certain psychiatric diagnoses appear more likely to be readmitted within 5 years with a diagnosis of intracranial tumor. Our findings narrow this association to specific tumor subtypes - namely primary benign neoplasm and meningioma. In the context of the ongoing debate over the relationship between brain tumors and preceding psychiatric pathology, we feel that our findings lend credence to the argument for retrograde causality, wherein specifically slow growing tumors may present with behavioral disturbances before becoming overtly symptomatic.

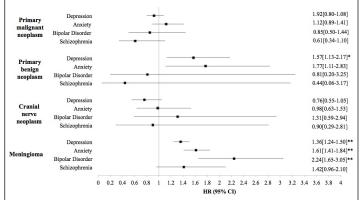
References

- [1] Ristic et al. Brain tumors in patients treated psychiatrically. Vojn Pregl. 2011;68(9):809-814.
- [2] Garssen et al. On the role of immunological factors as mediators between psychosocial factors and cancer progression. Psychiatry Res. 1999;85(1):51-61.
- [3] Reiche et al. Stress, depression, the immune system, and cancer. Lancet Oncol. 2004;5(10):617-625.

Hazard Ratios for Intracranial Tumor Diagnosis Within 5 Years of Index Admission



Hazard Ratios for Tumor Sub-type Diagnosis Within 5 Years of Index Admission



Adjusted hazard ratios for diagnosis of an intracranial tumor within 5 years of index admission for each psychiatric cohort. Ratios are relative to controls (i.e. patients without the respective psychiatric diagnosis). CI = Confidence Interval; HR = Hazard Ratio; * P<.05; ** P<.01, ***P<.001