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Prevalence of diagnosed ocular disease in veterans with serious mental illness☆

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ABSTRACT

Objective: To compare the prevalence of diagnosed ocular disease and eye disease treatment between Veteran's Administration (VA) patients with and without serious mental illness (SMI).
Methods: Retrospective comparison of diagnosed ocular disease and treatment prevalence among patients with and without diagnosed SMI in fiscal year 2011 in the VA Capitol Health Care System (VISN 5).
Results: We identified 6462 VA patients with SMI and 137,933 without SMI. The prevalence of diagnosed ocular disease was 22.7% in SMI patients and 35.4% in non-SMI patients ($P<.001$). Those with SMI had a higher prevalence of glaucoma (10.2% vs. 7.1%, $P<.0001$), cataract (12.6% vs. 9.2%, $P<.0001$) and dry eye (4.0% vs. 2.7%, $P<.0001$). Less than half (34.3%) of SMI subjects had been seen in ophthalmology or optometry vs. 23.0% of controls ($P<.0001$).
Conclusion: VA patients with SMI have a greater prevalence of diagnosed ocular disease, particularly cataract, glaucoma and dry eye. While SMI patients utilize eye care services at a higher rate than the general VA population, the majority of subjects with SMI do not get recommended annual eye examinations. More consistent annual ocular screening among VA patients with SMI may be indicated.

1. Introduction

Compared to others of similar age, individuals with serious mental illness (SMI) are at potentially higher risk for ocular disease due to their greater exposure to certain risk factors, including cigarette smoking [1], metabolic syndrome and diabetes [2] and antipsychotic medications, which predispose them to both cataract [3] and dry eye [4]. Indeed, prior research has shown that such individuals have a higher prevalence of visual impairment than the general population [5], and smaller studies conducted without comparison groups indicate that this population has a high prevalence of ocular disease [6,7]. For this reason, individuals with schizophrenia are recommended to have eye exams every 2 years until age 40 after which the recommendation is for yearly examinations [8,9]. To our knowledge, no prior work has evaluated the prevalence of diagnosed ocular diseases in any large and generalizable sample of individuals with SMI. Whereas individuals with SMI are known to have a higher rate of visual impairment, the prevalence of specific diagnosed ocular diseases and receipt of treatment for ocular disease have not been studied in large and generalizable U.S. population samples.

The Veteran's Administration (VA) treats greater than a quarter of a million patients with SMI annually [10]. The number of VA patients with SMI has increased steadily in the past 10 years and is projected to continue to increase with the influx of Veterans from Operations Enduring Freedom/Operation Iraqi Freedom and continuing operations [11]. The rate of age-related eye disease is similarly increasing in the VA population [12]. Given the high prevalence of SMI and the extensive diagnostic, procedure, pharmacy and utilization data available, the VA system is an ideal place to study the diagnosed prevalence of ocular disease and utilization of eye care services in this potentially high risk population. The purpose of this study is to assess the prevalence of diagnosed ocular disease in VA patients with SMI and to assess the utilization of clinic visits, medications, and cataract extractions as compared to the general VA population.

2. Methods

Data for the study were obtained from the VA pharmacy and health care utilization databases for patients in the VA Capitol Health Care

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Network (VISN 5), the mid-Atlantic service region that encompasses Maryland and Washington, DC; northern Virginia; and northeastern West Virginia. These areas are served by four VA hospitals and by a network of freestanding VA hospital-affiliated outpatient medical clinics. This study was approved by the institutional review board of the University of Maryland School of Medicine and the VA Maryland Health Care System (VAMHCS) Research and Development Committee.

2.1. Sample selection

To ensure that we included veterans that regularly followed up in the VA system, our analysis included all VA patients in the mid-Atlantic service region who had at least two contacts with the VA system in fiscal year (FY) 2011. We divided this group between those with and without SMI. Patients with SMI were identified using an algorithm established by the VA SMI Treatment Resource and Evaluation Center (SMITREC) [10]. Using the diagnostic codes from inpatient and outpatient encounter data, we identified all VA patients with diagnoses of schizophrenia/schizoaffective disorder (ICD-9 codes 295.0–295.4 or 295.6–9), bipolar disorder (ICD-9 codes 296.0–1 or 296.4–8), or other diagnoses of psychosis (297.0–3, 297.8–9, 298.0–4 or 298.8–9) during FY 2011 [10]. Patients with SMI were included provided they had at least one qualifying diagnosis in inpatient or outpatient data for FY 2011. Controls were all patients who had at least two contacts with the VA system in FY2011 who were not determined to have SMI using the above criteria.

2.2. Variables/risk factors

Demographic and socioeconomic characteristics included age, race, gender, income, marital status, service connection, prescription copay, homelessness and which facility the patient was seen. Patients were classified as diabetic if they had had at least two inpatient or outpatient records with diagnostic codes of 250.0–250.9, 357.2, 362.0 or 366.41, a previously validated methodology [13].

Ophthalmic diagnoses were abstracted from ICD-9 codes assigned at each eye clinic visit. We specified ophthalmic diagnoses of interest, focusing on cataract, ophthalmic complications of diabetes and glaucoma. Dry eye syndrome was also examined. Cataract included all forms of cataract specified by the ICD-9 code 366.xx. Ophthalmic complications of diabetes were specified with ICD-9 codes for ophthalmic manifestations of diabetes (250.5x), nonproliferative (362.01, 362.03, 362.04, 362.05, 362.06) and proliferative diabetic retinopathy (362.02), and diabetic macular edema (362.07). Glaucoma included all forms of glaucoma, including glaucoma suspect and the ICD-9 codes included were 365.xx. Dry eye syndrome was also determined by ICD-9 codes (370.33, 370.34, 372.53, 375.15 and 710.20). We assessed the diagnosed prevalence of all ophthalmic diagnoses by using ICD-9 codes for all ophthalmic diagnoses (360.xx–379.xx, 250.5x, 951.0, 951.1, 951.3). Eye care utilization was assessed by frequency of clinic visits to ophthalmology or optometry (VA clinic stop codes 407 and 408), prescription fills and procedure utilization. Ocular medications were categorized using the VA pharmacy classification system [14], and we specifically assessed if a VA patient had been prescribed at least one prescription fill of glaucoma medications (OP109), eye lubricants for dry eye (OP500) and overall ocular medication use (OPXXX). Frequency of cataract surgeries performed was determined from CPT codes (66,850–66,984) and ICD-9 procedure codes (13.2x-13.5x). Service connection in the VA system indicates that the diagnosis being treated is connected to the veterans' service and care related to that illness is covered by the VA insurance system. VA patients with greater than 50% service connection do not pay a prescription copay.

2.3. Statistical analysis

Patients with SMI were compared to controls for all collected variables. For categorical variables, chi-squared analysis was used, and for continuous variables independent, Student's *t* test was utilized. For ophthalmic diagnoses of interest, we stratified the diagnoses by age in 5 year intervals. Analysis of the prevalence of ophthalmic complications of diabetes was done for the entire sample as well as limited to patients diagnosed with diabetes. Multivariable analysis was completed for both ophthalmic diagnoses of interest and ophthalmic utilization, controlling for age, race and presence of diabetes. Glaucoma, cataract, eye clinic utilization, medication utilization and cataract surgery utilization were dependent variables, and age, race and presence of diabetes were independent variables. Ophthalmic complications of diabetes were assessed separately only among those who had a diagnosis of diabetes with independent variables of age and race.

3. Results

In FY 2011, there were 6462 veterans with SMI (4.5% of all veterans) treated in the VA Capitol Health Care Network and 137,933 veterans treated who did not have SMI. A total of 2287 (35.4%) patients with SMI vs. 31,324 (22.7%) control patients had diagnosed ocular disease ($P<.001$). SMI patients were younger, more likely to be female, more likely to be African American, poorer, and less likely to be married; had a high rate of service connection (and therefore lower prescription copay); and were more likely to be homeless, more likely to be treated in the VAMHCS and more likely to be diabetic (Table 1).

When ICD-9 code 367.xx, disorders of refraction and accommodation were removed, the prevalence of diagnosed ocular disease in patients with SMI and controls was 28.7% and 19.7% respectively ($P<.0001$). Diagnosed glaucoma had a prevalence of 10.2% in the SMI group and 7.1% in the control group ($P<.001$) (Table 2). Similarly, diagnosed cataract had a prevalence of 12.6% and 9.2% in the SMI and control groups, respectively ($P<.001$). Two hundred fifty-eight (4.0%) VA patients with SMI had dry eye syndrome compared to 3750 (2.7%) in the control group ($P<.0001$).

When cataract, glaucoma and ophthalmic complications of diabetes were stratified by age (Table 3), patients with SMI had a higher prevalence of cataract and glaucoma in nearly every age category as compared to controls (Table 4). There was no significant difference in the two samples in any age group for ophthalmic complications of diabetes. When restricting this analysis of ophthalmic complications of diabetes

Table 1
Demographics of veterans with and without SMI

Variable		SMI (n=6462)	Control (n=137,933)
Age*		54.7±13.8	60.0±17.0
Gender*	Male	5573 (86.4%)	121,674 (88.2%)
Race*	White	2938 (48.9%)	15,939 (53.4%)
	African American	2994 (49.8%)	13,404 (44.9%)
	Other	78 (1.3%)	527 (1.8%)
Income*	Mean	18,727.0 ±37,077.0	32,696.1 ±59,154.1
Marital status*	Married	1752 (28.7%)	66,287 (56.0%)
Service connection*		5885 (91.9%)	93,043 (73.2%)
Exempt from prescription copay*		2458 (38.4%)	27,697 (21.8%)
Homelessness*		1192 (18.4%)	4589 (3.3%)
VISN 5 facility*	Washington DC & W. Virginia	3769 (58.8%)	89,964 (66.3%)
	Maryland	2644 (41.2%)	45,651 (33.7%)
Diabetes*	Yes	1597 (24.7%)	26,067 (18.9%)
Any ophthalmic diagnosis*	Yes	2287 (35.4%)	31,324 (22.7%)

* Statistically significant difference, $P<.01$.