The second patient is a 49-year-old male who suffered at least 3 concussive blasts in the Army and a parachute injury. Following the last accident, the patient was diagnosed with major depressive disorder, panic disorder, PTSD and generalized anxiety disorder. He denies any psychiatric history prior to TBI including negative family history of psychiatric illness. In addition, he now suffers from nervousness, irritability, anger, emotional lability and concurrent concentration issues, problems completing tasks and alterations in memory.
Both patients underwent 1.5T multiparametric MRI using standard T2, FLAIR, DWI and T1 sequences, and specialized sequences including susceptibility weighted (SWAN/SWI), 3D FLAIR, single voxel MRI spectroscopy (MRS), diffusion tensor imaging (DTI), arterial spin labeling perfusion (ASL) and volumetric MRI (NeuroQuant). Importantly, this exam can be performed in 30–45 minutes and requires no injections other than gadolinium in some patients. We will discuss the insights derived from the MRI which detail the injured areas, validate the severity of the brain damage, and provide insight into the psychological, motivational and physical disabilities that afflict these patients. It is our expectation that this kind of imaging study will grow in value as we link specific patterns of injury to specific symptoms and syndromes resulting in more targeted therapies in the future.

A Multiparametric MRI Protocol for Evaluation of Cognitive Insufficiency, Dementia and Traumatic Brain Injury (TBI): A Case Series

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Abstract

Background. The purpose of this work was to determine the extent to which a multiparametric magnetic resonance imaging (MRI) approach to patients with dementia and/or traumatic brain injury (TBI) can help to determine the most likely diagnosis and the prognosis of these patients.
Objective. Volumetric brain MRI alone is recognized as a useful imaging tool to differentiate behavioral variant frontotemporal dementia (bvFTD) from the more common Alzheimer's disease (AD). Our objective is to create a protocol that will provide additional non-standard, objective imaging data that can be utilized clinically to distinguish common and uncommon forms of dementia and TBI. As patients with these diseases are increasingly presenting to clinical practice, our ability to combine multiple parameters within the standard 30-minute or 45-minute (pre- and post-contrast) MRI exams has high potential to affect current and future clinical practice.
Methods. All MRI studies were performed on 1.5 T MRI GE 450w or GE HDx imagers. All patients were seen clinically in outpatient practices. All techniques are FDA approved. The 30 minute protocol utilized T2w FSE 3 mm, 2.5 mm SWAN, 3D T1 sagittal 1.2 mm, DWI 5 mm, 3D FLAIR 1.2 mm, 2.5 mm SWAN (susceptibility sensitive), 3D T1 sagittal 1.2 mm, arterial spin labeling perfusion, posterior cingulate single voxel PRESS MR spectroscopy and NeuroQuant automated volumetric analysis and LesionQuant automated lesion detection and measurement. The 45-minute TBI protocol added diffusion tensor imaging, MR spectroscopy (MRS) of normal appearing frontal white matter and 3D gadolinium enhanced technique.
Results. The combination of multiparametric data together with standard imaging and clinical information allowed radiologic interpretation that was able to focus on 1–2 specific diagnoses and to indicate those patients in which a combination of pathologies was most likely. Neurologists, gerontologists, neuropsychologists and psychiatric specialists used these data and our summary conclusions to develop more specific diagnoses, treatments and prognoses.
Conclusions. Readily available MRI techniques can be added to standard imaging to markedly improve the usefulness of the radiologic opinion in cases of subjective cognitive insufficiency, clinical mild cognitive insufficiency, behavioral pathologies, dementia and post-traumatic brain syndromes.

Use of a Consultation Service Following Pharmacogenomic Testing in Psychiatry

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Presenting Author: Daniel Dowd

Abstract

Background. There is a plethora of drugs available to psychiatrists for treatment of mental illness, which can vary in efficacy, tolerability, metabolic pathways and drug-drug interactions. Psychotropics are the second most commonly listed therapeutic class mentioned in the FDA's Table of Pharmacogenomic Biomarkers in Drug Labeling. Pharmacogenomic (PGx) assays are increasingly used in psychiatry to help select safe and appropriate medication for a variety of mental illnesses. Our commercial laboratory offers PGx expert consultations by PharmDs and PhDs to clinician-users. Our database contains valuable information regarding the treatment of a diverse and challenging population.
Methods. Genomind offers a PGx assay currently measuring variants of 24 genes relevant for selection of drugs with a mental illness indication. Since 2012 we have analyzed > 250,000 DNA

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samples. Between 10/18 - 8/20 6,401 reports received a consult. The data contained herein are derived from those consults. Consultants record information on prior meds, reason for failure or intolerability, potential risk-associated or useful drugs based on the genetic variants. Consultants only recommend specific drugs and doses consistent with a published PGx guideline.
Results. The 5 most commonly discussed genes were SLC6A4, MTHFR, CACNA1C, COMT and BDNF. The 3 most commonly discussed drugs were fluoxetine, lithium and duloxetine. The most common reasons for drug failure were inefficacy and drug induced "agitation, irritability and/or anxiety". SSRIs were the most common class of discontinued drug; sertraline, escitalopram and fluoxetine were the three most commonly reported discontinuations and were also the 3 most likely to be associated with "no improvement". Aripiprazole was the most commonly reported discontinued atypical antipsychotic. The providers rated 94% of consultations as extremely or very helpful at the time of consult. An independent validation survey of 128 providers confirmed these ratings, with 96% reporting a rating of "very helpful" or "extremely helpful". In addition, 94% reported that these consults were superior to PGx consults provided through other laboratories. Patient characteristics captured during consults via a Clinical Global Impressions-Severity (CGI-S) scale revealed that the majority of patients were moderately (54%) or markedly ill (23%). The most frequent symptoms reported were depression, anxiety, insomnia and inattentiveness.
Discussion. The large variety of psychotropic drugs available to providers, and their highly variable response rates, tolerability, capacity for drug-drug interactions and metabolic pathways present a challenge for even expert psychopharmacologists. Consultation with experts in PGx provides additional useful information that may improve outcomes and decrease healthcare resource utilization. This database may provide future opportunities for machine learning algorithms to further inform implications of included gene variants.
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A Longitudinal Study to Assess Antidepressant Treatment Patterns and Outcomes in Individuals with Depression in the General Population

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Abstract

Study Objectives. Depression is an important cause of disability in the United States (US). The care experience of major depressive disorder (MDD) is highly variable and has only been documented to a limited degree. This study examines the prevalence incidence and treatment patterns for MDD in the US general population.
Methods. In this longitudinal study 2 interview waves were conducted between 2002 and 2015. The initial wave (W1) was carried out with 12,218 individuals from the general population in 8 US states with participants aged 18 years or older. In the second wave (W2) 10,931 of the initial participants agreed to be interviewed again 3 years later; the analyses were carried out for individuals who participated in both interviews (N=10,931). Diagnosis of MDD was confirmed according to Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) criteria.
Results. The 3-year incidence of MDD was 3.4% (95% CI 3.1%–3.7%). The prevalence of MDD was 5.1% (95% CI 4.7%–5.5%) and 4.2% (95% CI 3.8%–4.6%) in W1 and W2, respectively. The percentages of participants who achieved partial and complete remission were 4.4% (95% CI 4.0%–4.8%) and 3.9% (95% CI 3.5%–4.3%) in W1 compared with 7.9% (95% CI 7.4%–8.4%) and 4.4% (95% CI 4.0%–4.8%) in W2, respectively. The prevalence of MDD was 13.4% and 16.5% in W1 and W2, respectively, when including participants with MDD partial and complete remission episodes. 61.9% of participants with an MDD diagnosis in W1 had at least one associated comorbidity. 41.8% of participants with an MDD diagnosis at W1 still reported significant depressive symptoms at W2. 19.9% of participants in partial remission and 5.5% of participants in complete remission in W1 did not achieve remission in W2. 52.2% and 42.9% of participants with MDD were treated with an antidepressant (AD) in W1 and W2, respectively; selective serotonin reuptake inhibitors (SSRIs) were the most commonly prescribed (34.7% in W1 vs 28.3% in W2). ADs were mainly prescribed by primary care physicians (45.7%) followed by psychiatrists (31.4%), neurologists (2.5%), and other specialties (7.9%). The average duration of treatment was 36.9 (SE 2.4) months. More than one-third of AD users in W1 expressed dissatisfaction with their AD treatment which translated into changes in types of antidepressant in W2.
Conclusion. Depression affects a sizable part of the general population in the US with a prevalence of MDD at 13.4%–16.5%; yet MDD remains largely undertreated as shown by the finding that only about half (52%) of individuals in this study who met the diagnostic criteria for MDD were treated with an antidepressant (SSRI being the most common treatment). In addition, more than a quarter of patients with MDD in this study did not achieve remission after initial treatment underscoring the challenges in successful antidepressant treatment of MDD.
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