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Psychiatrist attitudes towards pharmacogenetic testing, direct-to-consumer genetic testing, and integrating genetic counseling into psychiatric patient care

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ABSTRACT

Psychiatric treatment has not historically included genetic counseling or genetic testing. It has been shown that psychiatric patients and their families benefit from genetic counseling and pharmacogenetic testing for pharmacological treatment. To date, no study has investigated psychiatrists' attitudes towards incorporating pharmacogenetic testing and genetic counseling into patient treatment. This study employed a five item survey to solicit the opinions of psychiatrists on the benefit of pharmacogenetic data, direct to consumer (DTC) genetic testing, and genetic counseling. A total of 113 psychiatrists responded to the surveys. The vast majority (94.6%) indicated that genetic data would be useful in making pharmaceutical decisions, and 86% felt that pharmacogenetic testing would become standard of care. Attitudes were split towards the benefit of direct to consumer genetic testing; 55.8% of respondents would refer a patient for DTC genetic testing that might help with treatment decisions. The majority (72.6%) believed that it would be beneficial to include genetic counselors in psychiatric patient care. The results of our study suggest there is potential for collaboration between psychiatrists and genetic counselors to enhance patient care.

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1. Introduction

In 2012, there were an estimated 43.7 million adults aged 18 or older in the US with a diagnosis of any mental illness, which represented 18.6% of all US adults. There were 9.6 million (4.1%) with serious mental illness (SMI) ([Substance Abuse and Mental Health Services Administration, 2013](#)). A recent analysis forecasts that an estimated \$16 trillion USD of economic output worldwide will be lost over the coming 20 years due to mental illnesses ([Bloom et al., 2011](#)). Depressive disorders have consistently been ranked in the top 5 causes of disability (years lived with disability/disability adjusted life years) worldwide in the Global Burden of Disease studies ([Ferrari et al., 2013](#)). Mental illnesses can have a huge impact on a person's quality of life and productivity, including earning less income and sustaining higher medical costs as compared to individuals without such a diagnosis ([Kessler et al., 2008](#)).

While efficacious treatments for mental illnesses are available, they are not equally accessible to everyone. Even for those who have access to care, treatment strategies are usually implemented over a long period of trial and error in order to establish the optimal treatment approach for that individual's mental wellness. This high cost of mental illness to society combined with limitations of treatment efficacy and personalization has motivated investigations into the detection and treatment of psychiatric illness, including ongoing attempts to elucidate the causes of psychiatric illness. All common psychiatric disorders have a demonstrated genetic component ([Kendler, 2005](#); [Cross-Disorder Group of the Psychiatric Genomics Consortium, 2013](#)), and there is increasing evidence for the role of particular genes implicated in the etiology of psychiatric disorders ([Sullivan et al., 2012](#)). As our understanding of the genetic underpinnings of mental illness has improved, so too has our understanding of genetic contributions to medication response, a.k.a. pharmacogenetics.

The potential to tailor psychiatric medication choice and dose based on pharmacogenetic test results holds great promise for patients and providers to shorten the time between diagnosis and effective illness management. There are many potential future roles for molecular genetics in the clinical management of psychiatric

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conditions (Bassett and Costain, 2012) including earlier, or more aggressive treatment, preference for, or avoidance of, particular psychiatric medications, tailored dosing, and differentiation of medication side effects from disease symptoms. Polymorphisms in CYP2D6, CYP2C19, CYP1A2, SLC6A4 and HTR2A have been shown to be associated with drug response and metabolism (Hall-Flavin et al., 2012, Hicks et al., 2013, Muller et al., 2013). Studies in 2013 showed that when pharmacogenetic testing of these genes was used to guide the pharmacological treatment of depression, the likelihood of treatment response and remission doubled (Winner et al., 2013, Hall-Flavin et al., 2013).

Testing for pharmacogenetic variants is currently available and pharmacogenetic information and its implications for treatment is included in the labeling of FDA approved medications, including many psychiatric medications (Table of Pharmacogenomic Biomarkers in Drug Labeling, 2014). While studies have found generally positive attitudes and low knowledge of pharmacogenetics amongst clinicians (Haga et al., 2012, Lanktree et al., 2014, Mrazek et al., 2007), a systematic review only identified one article that evaluated the attitudes of psychiatrists (Dodson, 2011). Approximately 50% of the genetic tests ordered

by psychiatrists over a period of six months in 2011/2012 were for pharmacogenetic variants (Salm et al., 2014), and clinical practice guidelines for their use in tailoring psychiatric patient care have recently been published (Hicks et al., 2013, Altar et al., 2013).

In routine practice, psychiatrists often discuss inheritance with their patients. A majority of 352 psychiatrists surveyed in 2005 stated that they routinely take family histories of psychiatric illness and discuss hereditary components with their patients, but the majority did not feel confident discussing genetic information and did not feel adequately trained to do so (Finn et al., 2005). While pharmacogenetic test result reports can contain detailed information regarding the interpretation of results and there may be some psychiatrists who will feel comfortable in managing these test results without the support of a genetic counselor (Hoop, et al., 2010b), research shows that others do not feel confident in this arena (Hoop et al., 2010a).

Genetic counselors are health care professionals with specialized training to help people understand and deal with the medical, psychological and familial implications of genetic contributions to disease. As such, genetic counselors are ideally positioned to support patients and psychiatrists in the

interpretation of genetic test results and discussions surrounding the causes of psychiatric illness. While pharmacogenetic test result reports can contain detailed information regarding the interpretation of results and there may be some psychiatrists who will feel comfortable in managing these test results without the support of a genetic counselor, research shows that others do not feel confident in this arena. Furthermore, the value of genetic counselors is greater than just the interpretation of genetic test results. Involving genetic counselors in the genetic testing process is important to maximize efficiency within the health care system, given previous research which has shown that genetic counselors can save patients and the health care system thousands of dollars in inappropriately ordered genetic tests (Miller, 2012). Additionally, studies have shown that psychiatric genetic counseling without genetic testing increases empowerment and self-efficacy, reduces internalized stigma and self-blame, provides a personalized risk assessment for other family members to develop a psychiatric illness, and clarifies misconceptions about causality of illness (Austin and Honer, 2008; Costain et al., 2014; Hippman et al., 2013; Inglis et al., 2014). Although historically neither genetic counseling nor genetic testing have been incorporated as part of psychiatric patient care, a survey of 372 psychiatrists in 2012 showed that 14% had ordered genetic testing in the last six months, 13.6% had received questions from their patients about DTC genetic testing, and 76.1% reported that they did not have a genetics professional (geneticist/genetic counselor) to whom to refer patients (Salm et al., 2014).

While there has been some research into the attitudes of psychiatrists towards pharmacogenetics and psychiatric genetic testing, the attitudes of psychiatrists towards collaborating with genetic counselors in regards to these results are unknown.

1.1. Purpose

This research project assessed psychiatrists' attitudes towards 1) pharmacogenetic testing, 2) DTC genetic testing, and 3) collaborating with genetic counselors in the context of receiving a pharmacogenetic test result for a patient.

2. Methods

This cross-sectional study used five questions (see Table 1) to assess attitudes towards integration of genetic counseling into psychiatric patient care, specifically in the

Table 1.
Survey questions.

Question	Responses (N=113)		
	Response options	Cohort in 'Genomic Prediction of Psychotropic Response' study (Surveys 1 and 2) (n=39) (n, %)	Survey 3 cohort (n=74) (n, %)
1. Would it be beneficial to have a genetic counselor discuss genetic test results with you and your patient?	Yes	21 (53.8)	61 (82.4)
	No	5 (12.8)	9 (12.2)
	Not familiar with genetic counseling	13 (33.3)	4(5.4)
2. Would you refer a patient to a direct to consumer (DTC) testing company to order genetic information that may help in treatment?	Yes	20 (51.3)	43 (58.1)
	No	19 (48.7)	31 (41.9)
3. Do you believe that having genetic data may help you and your patients make better decisions about his or her medications?	Yes	39 (100)	67 (90.5)
	No	0 (0)	6 (8.1)
4. Do you believe that you would act on specific data from your patient that may indicate potential drug-drug interactions?	Yes	37 (94.9)	73 (98.6)
	No	2 (5.1)	1 (1.4)
5. Do you believe that genetic testing will eventually become standard practice in patient treatment?	Yes	22 (81.5)	64 (86.5)
	No	5 (18.5)	10 (13.5)

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