Researching Physician's Priorities and Treatment of Mental Illness in Hypothyroidism

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

My sense of humor, my passion, and drive are all qualities I inherited from my mom. Fortunately for me, one thing I did not inherit is her autoimmune disorder, Hashimoto's, a form of hypothyroidism. When I was growing up, my mom suffered from many severe health issues, both physically and mentally. She was always exhausted, anxious, and overall felt extremely sick and miserable. Though she went to doctor after doctor, nobody seemed to know what was causing her to feel this way. Tests were run to check whether it could be hypothyroidism, but she was told time and time again that her results were normal. It took practically begging the doctors to find what was wrong for them to run an uncommon test that revealed it was, indeed, Hashimoto's. Medicine helped my mom begin to feel physically better, but it took years of research and drastic lifestyle changes on her part for the anxiety to finally subside.

Hypothyroidism, or an underactive thyroid, is a condition in which the thyroid gland doesn't produce or release enough crucial thyroid hormones into the bloodstream. Up to 5% of the general population is affected by this condition, with a further estimated 5% being undiagnosed. Symptoms can include weight gain, fatigue, poor concentration, depression, impaired memory, and menstrual irregularities (Chiovato et al., 2019). Due to the general absence of symptom specificity across patients and the large variation in clinical presentation, the definition of hypothyroidism is pre-dominantly biochemical. Biochemically, hypothyroidism refers to thyroid-stimulating hormone (TSH) concentrations above the reference range and free thyroxine concentrations below the reference range. Levothyroxine is the synthetic form of thyroid hormone (*Levothyroxine*, 2022). Orally administered levothyroxine (LT_4) taken daily has

been considered the standard of care for treatment of hypothyroidism for many years (Jonklaas et al., 2014). However, the sufficiency of LT_4 monotherapy treatment for all patients is being questioned as a substantial proportion of patients have persistent complaints despite consistent treatment (Chaker et al., 2017). A specific subset of the hypothyroidism patient population (16%) suffers from a genetic mutation that prevents LT_4 pills from eliminating specifically neurological symptoms such as depression and impaired memory (Eligar et al., 2016). The deficiency in symptom relief, especially those related to mental well-being, in this subset but also in the larger population of hypothyroidism patients led me to investigate why physicians place more importance on treating physical symptoms than they do mental symptoms.

The answer? Physicians place more importance on treating physical symptoms than on psychological symptoms in hypothyroidism patients because of an over-reliance on the biomedical model of healthcare and a general lack of knowledge and resources concerning hypothyroidism and mental health. The literature review for this paper will cover research on hypothyroidism as a contributor to mental illness and the escalating doubts and dissatisfaction with levothyroxine as a standard of care. To complete this project, I combine an analysis of academic journal articles and research studies done on hypothyroidism treatment with a dissection of literature discussing systematic contributions to physician complacency. In my analysis, I find that limited understanding of hypothyroidism and the overemphasis placed on physical malfunctions. I conclude with a consideration of how future research into new diagnostic processes and hypothyroidism in general could lead to the development of fully successful treatments.

Literature Review

Hypothyroidism is a potential etiology, or cause, for a variety of affective disorders. This is already well known. In fact, a quick google search will tell you that depression is a symptom of an underactive thyroid. Prior research has established, "Patients hospitalized with hypothyroidism have a greater risk of readmission with depression or bipolar disorder than control patients. This renders epidemiologic support to theories linking thyroid dysfunction with mood disturbances" (Thomsen et al., 2005). While it is not impossible that concurrent diseases or perimenopausal status might cause these specific symptoms, it is important that hypothyroidism is still equally considered as a potential etiology. The range of symptoms and affective disorders associated with hypothyroidism is so large that it even includes the extremes of presenting as mania or psychosis (Heinrich & Grahm, 2003). The possibility of hospitalization for psychosis or any other mental illness due to hypothyroidism can be really scary for patients and can influence many aspects of patient's lives. These symptoms should be taken as seriously as physical symptoms.

Several scholars agree that levothyroxine as a standard of care is not sufficient in relieving psychological symptoms of hypothyroidism. A case-control study performed on 393 women revealed that, "The prevalence of anxiety in levothyroxine-treated hypothyroid women was higher than in women without hypothyroidism (29.45% vs. 16.7%, x2p < 0.001). Levothyroxine-treated hypothyroid women were more likely to have anxiety (OR = 2.08, CI: 1.28-3.38) and depression (OR = 3.13, IC = 1.45-6.45)" (Romero-Gomez et al., 2019). The results from this study and many other similar studies clearly show that, despite being treated with hormone replacement pills, patients are still sick. The ineffectiveness of LT_4 does not even solely affect a small subset of patients. In fact, the prevalence of anxiety in hypothyroid patients

can reach 63-65% (Romero-Gomez et al., 2019). That is well over half of all patients. With this large of a patient population remaining symptomatic, it raises the question that it should be the standard of care.

My analysis of the current standard of care for hypothyroidism patients draws on the clear gaps in knowledge and common misunderstandings of hypothyroidism and mental illness, which allows me to use Susan Leigh Star's Infrastructure as a conceptual framework to analyze any collected data. Infrastructure is a fundamentally relational concept, only existing and becoming in relation to organized practices (STAR, 1999). Studying infrastructures is about studying the unstudied, which is my aim in performing this research. I want to see what goes on in the background of the United States health system and society that has led to the acceptance of subpar treatments. Something important to studying infrastructure is its embeddedness, or in other words, infrastructure depends greatly on and impacts its environment. Infrastructure links with conventions of practice, it is depended on past conventions. Finally, infrastructures work with other infrastructures through common interfaces. This is called the embodiment of standards. I will use this framework to analyze the way that past and current diagnostic processes and treatments available for hypothyroidism have created a level of physician complacency. While existing research agrees that hypothyroidism can contribute to or cause mental illness which is not sufficiently treated by the current standard treatment, scholars have not yet adequately considered why physicians prioritize treating physical symptoms over psychological symptoms.

Methods

Currently, research is being done into the effectiveness of current hypothyroidism treatments, hypothyroidism symptomology, and mental illness. That being said, there remains several gaps in knowledge and understanding. In determining the reason for the disparities experienced by hypothyroidism patients, I decided that collecting available literature would highlight the questions that remain unanswered. The questions that are currently being investigated serve as an example of how little people realize just how big of a problem hypothyroidism is. There are plenty of avenues that haven't been explored and that require further inquisition. In preparation to write this research paper, I gathered academic research articles focusing on the relationship between hypothyroidism and affective disorders. I found many articles that provided background to support and validate my claim that physicians are not prioritizing neurological symptoms in hypothyroidism patient treatment. I delved into papers that provided me with more context and information of the diagnostic and treatment processes. Mostly, though, I looked for journals that commented on patient-physician interactions as well as relevant systemic issues. In my review of this evidence, I examined the underlying circumstances that led to accepting LT_4 as the standard of care, with a focus on the embedded infrastructure and its links with the conventions of practice and the embodiment of standards.

Analysis

The lack of awareness and understanding of the complexity and potential impact of hypothyroidism contributes to bias and inaccurate perceptions of the disease by primary care physicians. About 5-10% of hypothyroidism patients who are biochemically well controlled with

levothyroxine, the current standard of care, have persistent symptoms such as depression and impaired mental wellbeing (Chaker et al., 2017). With over 20 million levothyroxine-treated hypothyroidism patients in the US, this means that around 2 million people in the country are insufficiently treated for their symptoms despite receiving a diagnosis (*Levothyroxine - Drug Usage Statistics, ClinCalc DrugStats Database*, n.d.). These numbers alone highlight the need for a proper treatment for these patients, without even accounting for the 5% of the population that has yet to be diagnosed. For a condition that effects so many, in such a large way, it is rare to see efforts put into raising awareness for hypothyroidism. There is rarely fundraisers for hypothyroidism, though the endocrinology field would benefit greatly from more proceeds. A study conducted 16 interviews including nine general practitioners, four pharmacists, two practice nurses, and one nurse practitioner. The study revealed inadequate physician and nurse knowledge of levothyroxine pharmacokinetics and general practitioners' assumptions that patient compliance or additional conditions are the reason behind persistent neurological symptoms (Dew et al., 2018). There is a health professional behavioral component to the management of hypothyroidism. The perception of hypothyroidism as a straightforward and less concerning condition leads to inadequate time spent on proper patient education and treatment. Assuming that patient compliance is the reason for the persistent symptoms simply reinforces the focus on fixing the biochemical numbers and physical symptoms rather than continuing to search for adequate treatment. Patient compliance is likely more attainable when careful effort is placed into explaining the necessity to follow treatment plans exactly.

Furthermore, the over-reliance on TSH within the reference range as the sole measure of adequate thyroid hormone replacement can lead to suboptimal treatment of hypothyroidism. A study was conducted in which neurocognitive tests (attention, working memory, etc.) and well-

being questionnaires were given to 141 hypothyroidism patients whose scores were then compared with reference values. Neither serum TSH nor thyroid antibodies were determinants of neurocognitive functioning and well-being (Wekking et al., 2005). Remember that these TSH concentration measurements are the data that doctors use to determine whether a patient's treatment is successful. It is a question in itself why this metric was chosen to begin with. This standard is not always sufficient as TSH concentrations do not accurately describe the condition of the entire endocrine system and body. This is a clear example of how embedded infrastructures link with conventions of practice. Circulating thyroid hormones are responsible for regulating the body's metabolism, or the process of transforming food into energy (*Thyroid*, n.d.). The TSH concentration necessary to achieve optimal circulating thyroid hormone concentrations differs between individuals (Chaker et al., 2017). This variability offers an explanation for differing patient response to treatment, despite having similar TSH levels. Notwithstanding the evident inaccuracies of using TSH levels, some believe that presenting patients with these improved biochemical measurements reinforces confidence in their treatment plan, therefore positively impacting their mental health. Yet it should be noted that a series of interviews conducted with levothyroxine-treated hypothyroidism patients revealed that those still ailing felt that their normal TSH result hindered further evaluation by their general practitioners. The interviewer claimed that, "A TSH concentration within the reference range was perceived by most patients to be an unsatisfactory measure of wellbeing that often precluded meaningful interaction with their practitioners" (Dew et al., 2017). Although it can be reassuring to see an improvement in medical tests, it can have a bigger detrimental effect by silencing patients.

The prevailing biomedical model of healthcare, which prioritizes the treatment of physical symptoms, also influences the current clinical guidelines for hypothyroidism

management and physicians' decision-making in clinical practice. The biomedical model of healthcare is the dominating model for the United States health system in which diagnosis and treatment are based solely on biological and physical factors, while tending to ignore the psychological and environmental aspects. An obvious manifestation of this model is the division of healthcare services for mental illness (psychotherapy) and for the body (medicine). This strategy can be attributed to the assumption that any illness can be explained by a singular physical malfunction, a phenomenon called reductionism (Rocca & Anjum, 2020). Though reductionism has led to the development of important treatments, such as antibiotics, it can have some rather detrimental implications for patients. Derick Wade, a professor of neurological rehabilitation, and Peter Halligan, a professor of psychology, claim that, "The assumption that a specific disease underlies all illness has led to medicalization of commonly experienced anomalous sensations and often disbelief of patients who present with illness without any demonstrable disease process" (*Do Biomedical Models of Illness Make for Good Healthcare Systems? - PMC*, n.d.). As victims of a condition that is already not well understood, talked about, or taken care of, hypothyroidism patients continue to be discredited, dismissed, and silenced. The systematic trends assume that with one cause comes one fast acting treatment. Because infrastructure is embedded, it heavily relies on and impacts its environment. The infrastructure surrounding hypothyroidism and its treatment relies on the health system in which the treatment is taking place. The biomedical model contributes to the existing stigmatization of patients that experience persistent symptoms despite normalized TSH levels. This stigma leads to invalidating patients' experiences and undertreating hypothyroidism.

Conclusion

At this point in time in the United States of America, the stigma surrounding mental illness is beginning to diminish. Though the progress made is greatly positive and has contributed to affective disorders becoming acceptable diagnoses, the disregard of this fact in the past has left large gaps in knowledge surrounding the etiology, diagnosis, and treatment of such conditions. Without universal understanding of mental illness in the nation's health system, there are many unresolved issues that have yet to be addressed. Not only have the magnitude and numerous consequences of leaving patients untreated been largely ignored, but they have also been *unrecognized*. Medical conditions that are known to be substantial problems without a cure or thorough treatment, such as cancer or Parkinson's disease, are most commonly funded and researched. A better understanding and further awareness of hypothyroidism and mental illness could aid in attracting more research to be done into new and improved treatments.

After reading this paper, care providers may further educate themselves on mental illness, affective disorders, and hypothyroidism. Primary care physicians may change their routine interactions with hypothyroidism patients whether this be the information they provide, the diagnosis process, or the treatment options/plan. Individuals working in the medical field may even start to reconsider their level of reliance on the biomedical model of healthcare. I believe that healthcare providers should consider adopting a more holistic approach to the management of hypothyroidism and other diseases with a significant neurological aspect and be sure to consider both the physical and psychological symptoms. This approach could even involve the use of patient-reported outcomes as relevant data. It is important that when treating lesser-understood maladies that the patients are heavily involved in the process. Learning about patient

initiatives, such as homeopathic medicine, that work to improve the patient's condition can serve as a way to discover, if not better treatments, other options for patients that are still suffering.

There is a lot of future research that can be done to work towards a solution for this problem. More work should be done looking into whether the reasoning for the difficulty in attending to psychological symptoms is different for hypothyroidism than for other maladies that remain insufficiently treated. It is possible that these obstacles are similar, and that there may already be a solution, or other patient populations that would benefit from one. Research should also be done to find new ways to measure whether thyroid hormone replacement is an adequate treatment other than by using TSH levels. Other future studies could be done to discover ways to differentiate (clearly and accurately) between etiologies for affective disorders.

There is clearly a long way to go in addressing mental illness in a clinical setting without discounting the patient's experience and instead treating the real problem. The future of medicine relies on doctors, scientists, and engineers to prioritize the quality of life of patients (which relies strongly on their mental health and well-being). With an emphasis on proper diagnosis, more logical and relevant research can and will be done with the real possibility of finding treatments that can help patients to the full extent.

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