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Research Article

Vitiligo: Quality of Life in Immunocompromised Patients

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Abstract

Vitiligo is an acquired depigmentation disorder marked by the autoimmune destruction of melanocytes. The disorder is highly genetic in origin, and poses risk for later development of other autoimmune diseases. Vitiligo is characterized by segmental and non-segmental forms, and involves the appearance of white macules spread throughout the skin. This disorder affects males and females equally, and has a worldwide prevalence of 1%. While it does not directly affect mortality, it can lead to a myriad of psychosocial disorders, the most common of which are anxiety, major depressive disorder (MDD), obsessive compulsive disorder (OCD), panic disorder, bipolar, and schizophrenia. Screening tools such as the Short Form-26, Skindex-29, and the Vitiligo Impact Scale-22 have demonstrated considerable value in determining the rate of mental health disorders in this patient population. Therefore, the aim of this review is to examine how one's quality of life (QOL) is impacted by this condition, and the measures clinicians can take to better understand their patients as they navigate the course of their illness.

Key words: major depressive disorder; obsessive compulsive disorder

Introduction

Vitiligo is a chronic, autoimmune depigmentation disorder that can that can profoundly impact one's quality of life (QOL). This cutaneous condition is characterized by the development of white macules on the skin that are well-demarcated due to the destruction of epidermal melanocytes. Melanocytes are the cells that are responsible for the color of our skin and hair. The body's dysregulated attack on one's own melanocytes by autoantibodies creates areas of depigmentation, which can range in localization and symmetry [3]. Specifically, tyrosinase, the enzyme that catalyzes the rate-limiting step of melanin production, was found to be a major autoantigen in generalized vitiligo [1]. While vitiligo isn't a life-threatening disease, the toll it can take on a patient can be. The conspicuous patches are hard to conceal, and can distort one's self-image, while dismantling their self-confidence. This is especially true for children, who were found to be more depressed and anxious about their condition [9]. When treating these patients, it is crucial to be aware of the humanistic burden that vitiligo presents.

Vitiligo is the most common depigmentation skin disorder with a prevalence of 0.5%-2% in both adults and children. While males and females are affected equally, there is substantial evidence that supports a strong genetic basis for the disease, with 20% of patients having at least 1 first-degree relative with vitiligo. Monozygotic twins also have a 23% concordance rate. Additionally, micro-RNAs (miRNAs), or segments of non-encoding RNA, have been classified as potential contributors to the pathogenesis of vitiligo. Additionally, high levels of cortisol, a major stress hormone, and dehydroepiandrosterone (DHES), an antioxidant hormone, are positively correlated to vitiligo severity and to psychological distress. Reduced levels of antioxidant enzymes such as superoxide dismutase and glutathione peroxidase have also been implicated in the development of vitiligo. This may be especially important in treating patients, as will be discussed later in this article. Patients are also more susceptible to other autoimmune diseases including rheumatoid arthritis, thyroid disease, diabetes mellitus, psoriasis, pernicious anemia, and autoinflammatory syndromes. Consequently, the treatment of vitiligo continues to be one of the most difficult challenges in dermatology practices [1]. Successful clinical outcomes often require phototherapy, topical and systemic immunosuppressants, and even surgical grafting to stimulate repigmentation.

Vitiligo can be a source of continued psychological distress, and can increase the risk of psychiatric morbidity [2]. A 2020 study from the Taiwan National Health Insurance Research Database [4] revealed a 2.026-fold increased risk of developing psychiatric issues in males and females of all age groups, and in all facility levels of care [5,6]. Compared to controls, patients with vitiligo had an increased risk of developing major depressive disorder (MDD), manic disorder, obsessive compulsive disorder (OCD), anxiety, bipolar disorder, and schizophrenia. Underlying the common pathogenesis among vitiligo, OCD, and schizophrenia are pro-inflammatory cytokines such as IL-1, IL-6, and TNF-alpha which were found in all subjects [9]. This supports the use of antidepressants such as monoamine oxidase inhibitors (MAOIs) tricyclic antidepressants (TCAs), and serotonin/norepinephrine reuptake inhibitors (SSRI/SNRIs) as part of treatment regimen.

To assess for profound psychosocial changes in vitiligo patients, various clinical questionaries have been formulated. These include the Vitiligo Impact Scale (VIS)-22, the Short Form (SF)-26, and the Skindex-29. These scales address not only the changes in physical symptoms, but the corresponding psychological implications of the disease. For example, the domains tested among the questionaries included changes in attitude, social interactions, self-confidence and perception, depression, and anxiety. Patients then self-reported on how each factor of their life had been

compromised by their condition. Greater scores on each respective scale indicated a more severe impact on one's QOL. Beck's Anxiety Inventory and Depression Inventory also showed heightened levels of insecurity and anxiety, as well as diminished sexual arousal due to this condition [9]. Therefore, the goal of this article is to explore, in detail, vitiligo's impact on one's QOL, and how physicians can try to combat these devastating symptoms through a more wholistic treatment approach. I will discuss areas of clinical improvement, and ideas for medical practice that can better manage the psychosocial impacts of vitiligo.

Methods:

To gather published data, I used Covidence, an online tool for systemic literature reviews. This allowed me access to literature from PubMed, Google Scholar, Medline Plus, and Journal of the American Academy of Dermatology. To aid in screening, key words such as "autoimmune", "depigmentation", "hypopigmented", "vitiligo", "management", and "melanocytes" were used. Participants included both sexes and ranged in age groups from pediatric to adult, as I felt it was necessary to explore the psychosocial implications spanning vast age ranges. Importantly, however, patients diagnosed with OCD, anxiety, MDD, manic disorder, bipolar, or schizophrenia before their vitiligo diagnosis were excluded from the study. This was intentional as I wanted to focus on how the diagnosis and its implications affected the psyche. Additionally, patients with other skin disorders were purposely excluded. Participants were selected from both the United States and Asia. This was important because the Vitiligo Impact Scale (VIS)-22 was developed in New Delhi, India as a way to explore how severe the social stigma was as the white macules contrasted greatly against the normally pigmented brown skin. Questionaries used to assess participant's experiences included the Short Form (SF)-36, Skindex-29, and the VIS-22 [10]. The SF-36 questionnaire contains 36 items from 8 domains: physical functioning, social functioning, physical role limitations, bodily pain, mental health, vitality, and general health perceptions. The Skindex-29 questionnaire contains 29 items from 3 scales: physiological symptoms (itch, pain, irritation), emotion (depression, worry, shame, embarrassment, and frustration), and functioning (social life, sleep, social isolation, sexuality, work, hobbies). This assessment focused on changes in participants responses from previous weeks to gauge any changes in mental and physical states. Similarly, the VIS-22 questionnaire used on Indian participants assessed for changes in self-confidence, anxiety, family worries, and social interactions surrounding education and occupation. A longitudinal study conducted In Taiwan examined the onset of psychiatric illness following vitiligo diagnosis over a 13-year timeframe. Such longitudinal studies are useful in examining the long-term implications of medical diagnoses, and how they can alter one's QOL.

Results:

Analyses from self-reported questionaries revealed greater impacts on the emotional domains. Skindex-29 and SF-36 results from a study of 250 vitiligo patients whose ages ranged from 18-74, showed how vulnerable this patient group can be. When compared to their controls without vitiligo, these patients demonstrated worsening mental health (MH) outcomes. Women were found to have more emotional problems than did men, especially if they had generalized, widespread vitiligo on the chest. Patients who underwent previous treatment and had darker skin tones had poorer physical functioning on the SF-36. Similar findings were drawn from 100 subjects in New Delhi, India who rated the psychosocial impacts of vitiligo from clinically designed questionaries (VIS-22). The VIS-22 demonstrated a clinically significant difference in responses between men and women, with the latter reporting more emotional and mental distress ($P = 0.05$) [10]. These results may also highlight the stigma the condition carries in different parts of the world, especially in Southeast Asian cultures. A longitudinal study from the National Health Insurance Research Database of Taiwan enrolled 1432 subjects and matched them with controls to determine the incidence of mental health disorders such as OCD, anxiety, manic disorder, bipolar disorder, and schizophrenia in patients following their diagnosis. The Kaplan-Meier analysis showed that in the first year of diagnosis, the incidence of psychiatric disorders was higher in vitiligo patients than in controls. At the end of the follow-up, 38.41% of patients developed psychiatric disorders while 35% of controls did. Thus, researchers concluded that patient with vitiligo had higher rates of psychiatric disorders, namely anxiety, OCD, and manic disorder, compared to their controlled counterparts ($P = 0.031$).

Discussion:

When treating patients with cutaneous illness, it is imperative that we pay special attention to the psychosocial implications of the disease. Because of its immediate visibility, vitiligo presents unique challenges that extends beyond autoimmune destruction of melanocytes. This pigmentation disorder can pose serious threats to one's wellbeing, increasing the incidence of mental health disorders among a variety of age ranges and backgrounds [12]. Factors such as gender, age, and duration of illness were significant risk factors for the development of depression in these populations. Vitiligo management should take on a personalized approach. Patients should be made aware of the treatment options tailored to potential psychological symptoms in the early stages of diagnosis. This can help guide the recovery process and ensure that patients have adequate treatment options if they were to develop MH disorders such as anxiety, depression, OCD, manic disorder, and bipolar. It is at this stage that I believe education becomes paramount in directing the course of treatments. Many newly diagnosed patients are solely focused on trying to understand the mechanics of an autoimmune disease, and may be prioritizing steroids, cutaneous treatments, and Wood's lamp therapies. While a combination of these may prove to be successful in treatment, physicians should take time to also discuss the benefits of therapy and group support if needed. This will help to dismantle stigmas that surround the condition, and prepare patients for imminent hurdles they may encounter. Additionally, there should be focused research regarding the role of anti-inflammatory and neuroprotective compounds in vitiligo treatment. An overproduction of reactive oxidation species (ROS) and underproduction of antioxidant enzymes may cause an imbalance of cellular redox status that destroys melanocytes. Neuroinflammation results from increased pro-inflammatory cytokines such as IL-1Beta, IL-2, IL-6, TNF-Alpha, and IFN-Gamma [12]. Flavonoids such as baicalein, quercetin, and kaempferol have displayed neuroprotective and antioxidant properties [9], all of which may further promote melanogenesis and melanosome maturation. These medial advancements, coupled with wholistic, patient-centered care may prove to be invaluable in treating this cutaneous disorder.

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