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Review Article

The Behavioral Aspect of Huntington's Disease

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Abstract:

Huntington's Disease (HD) is a rare genetic neurodegenerative disorder characterized by heterogeneous impairments in motor function, cognition, and behavior. While motor symptoms, notably chorea, are readily identifiable, nonmotor symptoms such as behavioral disturbances significantly diminish the quality of life for patients and their caregivers. Recognizing and addressing these psychiatric manifestations is crucial for enhancing functional capacity in HD patients. This article provides an overview of the pathophysiological mechanisms underlying behavioral symptoms in HD and explores both non-pharmacological and pharmacological strategies for their management, aiming to improve patient outcomes and caregiver support.

Key words: huntington's disease; behavioral symptoms; management; neuropsychiatry; psychiatry; neurodegenerative disease; behavioral techniques; quality of life

Introduction

Huntington's disease (HD) is a rare, fatal autosomal dominant neurodegenerative disorder characterized by complete penetrance and caused by a cytosine-adenine-guanine (CAG) repeat expansion in the huntingtin gene on chromosome 4 [1]. Its clinical manifestations encompass progressive movement disorders, cognitive decline, and neuropsychiatric disturbances. HD is the most common cause of chronic hereditary chorea, usually the most recognized feature and fundamental phenomenology in adults with HD [2]. However, it is less bothersome for caregivers and patients with HD when compared to cognitive and neuropsychiatric disturbances [3]. Most people with HD, at some point during the course of their disease, will experience multiple neuropsychiatric symptoms severe enough to affect function. These symptoms tend to affect caregivers and families more than the patients themselves, who may lose insight.

HD-related neuropsychiatric symptoms have been described since the first publication of this disease by Dr. George Huntington in 1972 [4]. He explained that "the tendency to insanity, and sometimes that form of insanity which leads to suicide, is marked." This initial observation highlights the importance of managing this aspect in HD to minimize its detrimental consequences, improve patients' quality of life, and support their caregiver

Neuropsychiatric Symptoms

Neuropsychiatric symptoms are prominent features in patients with HD, referred to in this article as disorders of affect and behavior, excluding cognitive impairment, for the sake of simplicity. However, the close

relationship and co-occurrence between cognitive and behavioral problems in HD, as observed in other neurodegenerative diseases, makes it challenging for these two issues to be mutually excluded. For instance, patients typically exhibit poor cognitive performance in planning and flexibility neuropsychological testing, in addition to social cognitive dysfunction, especially difficulty recognizing facial emotions. These deficits might lead to misunderstandings, irritability, and outbursts.

The prevalence of neuropsychiatric symptoms in HD has been estimated between 33% to 76% [5-6]. This wide range of prevalence may be attributed to the combination of the population studied, the use of different methods to assess psychiatric symptoms, and the inconsistency in the definitions used.

A large European international cohort study (REGISTRY) from 15 European countries demonstrated that neuropsychiatric symptoms are highly prevalent in HD, especially in late stages, with apathy being the most common frequent symptom and showing the strongest association with disease progression [7]. In this study, five neuropsychiatric symptoms (depression, irritability/aggression, obsessive/compulsive behaviors, apathy, and psychosis) were evaluated using the unified HD rating scale within a month of clinical evaluation and a median disease duration of 5.9 years. Apathy was reported by 47.4% of subjects, while depression and irritability/aggression occurred in 42.1% and 38.6%, respectively. Obsessive-compulsive behaviors and psychosis symptoms were less common, reported by 25.8% and 4.1% of subjects, respectively.

This article will review the most common neuropsychiatric symptoms in patients with HD.

Affective Disorders

Depression and suicidality were recognized as early as the initial description of this condition by Dr. George Huntington in 1872 when he referred to a "tendency to insanity, and sometimes that form of insanity leads to suicide, is marked" in his original paper [4]. However, although affective disorder was a prominent feature of this disease, chorea was still the main description in subsequent reports since it is easier to recognize clinically. Depression might also worsen with the use of medication such as tetrabenazine. Frequently patients with HD suffer from symptoms included in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) major depression diagnostic criteria but not necessarily having affective disorders. For example, apathy, weight changes, insomnia or hypersomnia, fatigue, psychomotor agitation, and problems concentrating are common nonmotor features of patients with HD and other neurodegenerative diseases, such as Parkinson's disease, even without feeling clinically depressed, making it more challenging to diagnose and receive appropriate treatment. Depression might be the initial presentation of the illness preceding the onset of chorea by many years [8].

In a cross-sectional study of HD gene carriers from the Enroll-HD database, approximately 65% of the HD gene carriers had a history of depression, and ~ 27% had previous suicidal ideations/attempts [9]. Another analysis from Enroll-HD data showed pre-and manifest disease stages are associated with current (5.8-10%) and a history of suicidal ideation (18.6-30.9%) [10].

In addition, depression is expected as a psychological reaction by the patient to know they are suffering from a fatal and incurable disease. Some authors disagree with this last statement. Also, it might negatively correlate to cognitive decline, possibly resulting from concurrent decreasing illness insight [11]. Depression increases during the disease course and peaks during the early motor symptomatic phase. However, its prevalence is lower in the last stage [12] and unrelated to the CAG length [13].

There are two significant factors associated with depression in HD, which are female sex and having a prior history of depression (Odds ratio=5.57) found in the REGISTRY study [7]. However, depression, anxiety, bipolar disorder, antidepressant or anxiolytic use, and a prior suicide attempt at baseline were associated with suicidal ideation or attempt based on an analysis of the 2CARE clinical trial [14].

Suicide has been described as the third most frequent cause of death (6.6%) in patients with HD after pneumonia (19.5%) and other infections (6.9%) [15], and estimates of lifetime prevalence of suicidal ideation are as high as 20% in this group of patients [16]. In general, the risk of death by suicide, when compared to the general population, has been estimated to be two to seven times greater than the general population [17]. The risk of suicidal ideation is higher immediately before receiving a formal diagnosis of HD when developing nonspecific motor abnormalities (soft signs) and when the patient's independence begins to diminish, described as stage 2 based on the total functional capacity scale score [18].

Apathy

Apathy, characterized by a loss of interest and motivation accompanied by a flattened affect, was initially defined in 1990 as a reduction in goal-directed cognition associated with emotional indifference, decreased interest, and a lack of plans, goals, and productivity [19, 20].

The prevalence of apathy appears to increase progressively with advancing disease stages, particularly manifesting prominently in the late stages [7]. However, it is imperative to acknowledge the varied scales and definitions utilized in the literature to assess apathy, potentially impacting the interpretation of study findings. Furthermore, the relationship between apathy and other psychological disorders such as anhedonia, abulia, and depression remains ambiguous.

While some authors suggest apathy as a precursor to depression, empirical evidence demonstrates limited or no correlation between apathy and depression in HD patients [21]. Notably, Naading et al. elucidated that apathy and depression are distinct dimensions, with apathy being associated with cognitive decline and functional deterioration, unlike depression [21]. Typically, apathy can be discerned from depression by the absence of sadness and negative or suicidal ideation. Interestingly, Van Duijin et al. (REGISTRY) found an independent association between apathy and the use of

antipsychotics and benzodiazepines; however, causal implications between psychotropic medication use and apathy remain unclear [7]. In clinical practice, patients with HD often underreport apathy symptoms, differing from observations in Parkinson's disease. However, caregivers and family members frequently note the patient's lack of motivation and interest.

Moreover, apathy is significantly associated with disability and diminished quality of life, exerting a detrimental impact on interpersonal relationships. Hence, thorough assessment of this prevalent symptom is essential to enhance the well-being of HD patients and alleviate burden on their caregivers and families.

Irritability And Aggression

Irritability and aggressive outbursts are among the most distressing and challenging behavioral manifestations of HD for caregivers and families, often leading to institutionalization. Compounding the issue, many institutions are hesitant to admit patients with unpredictable episodes of anger and violence. The prevalence of irritability/aggression escalates with advancing disease severity, as observed by Van Dujin et al., who noted a higher frequency of positive psychiatric history for depression, obsessive-compulsive behavior, psychosis, and suicide attempts among these patients, along with increased use of antipsychotics and mood stabilizers [7]. Patients with HD frequently display heightened irritability and frustration without discernible triggers, resulting in escalating negative situations and severe outbursts characterized by impulsivity and disinhibition. These outbursts often target individuals closely involved in the patient's care, leading to noticeable disruptions in caregiver-patient relationships. The distress caused by these behaviors is profound, with caregivers sometimes hesitating to disclose incidents of violent behavior for fear of exacerbating the situation after medical follow-up appointments. Notably, irritability in HD is predominantly mediated by an exaggerated response to provocation rather than a failure of motor inhibition [26].

In the author's experience, family members or caregivers may discreetly document incidents without the patient's awareness to prevent violent repercussions and further stressful interactions. Providing a safe space for caregivers to express their concerns confidentially is essential. While aggression towards strangers is less common, it can present significant legal challenges. However, criminal behavior in HD patients, as observed by Olvera et al., rarely results in serious criminal charges, with traffic violations and violence towards caregivers being the most prevalent offenses [22]. Fortunately, these symptoms typically respond well to off-label pharmacological and nonpharmacological interventions, which will be further discussed in this article.

Obsessive/Compulsive And Persevertvie Behaviors

Obsessive/compulsive behaviors (OCBs) are characterized by recurrent intrusive and inappropriate thoughts (obsessions) and repetitive behaviors (compulsions) aimed at alleviating psychological distress [23]. Conversely, perseverative behavior (PB) is defined as the uncontrolled repetition or continuation of a response (motor act, word, thought, activity, strategy, or emotion) beyond its original context or rationale, which may not necessarily cause distress [24]. However, Read et al. (TRACK-HD investigators) found that patients exhibiting perseverative symptoms are associated with a lower health-related quality of life in their gene-negative partners [25]. OCBs observed in the context of HD can be classified as "obsessive-compulsive and related disorders due to another medical condition" according to DSM-5 [23]. The prevalence of moderate to severe OCBs increases progressively with disease stage, from 4.5% in Stage 1 to 25.8% in the late stages [7].

In clinical practice, caregivers often express concerns regarding the perseverative tendencies or OCBs of HD patients. Common examples include patients repeatedly asking the same question within short intervals, displaying resistance to changes in routine that may provoke angry outbursts, or insisting on specific arrangements of personal items such as night lights and clocks, which, if altered, lead to distress. It is crucial for caregivers to recognize that HD patients may not perceive these behaviors as abnormal and therefore may not independently seek to modify them.

Understanding and addressing these behaviors are vital not only for the well-being of the patient but also for maintaining harmonious caregiver-patient relationships and improving overall quality of life.

Psychosis

The prevalence of psychosis in HD is comparatively lower than that of other neuropsychiatric symptoms, with an estimated 1% to 17% of individuals experiencing psychotic manifestations, including hallucinations or delusions, at some stage of the disease [7, 27]. However, it is plausible that the documented prevalence rates in the literature may be conservative, as many patients in these studies were receiving treatment with neuroleptic agents, potentially masking psychotic symptoms. Furthermore, the significant communication deficits observed in advanced stages of HD may contribute to underreporting. Variability in prevalence rates is likely influenced by differences in study methodologies, sample sizes, assessment scales utilized, and definitions of terms.

Patients presenting with psychosis often exhibit a worsening trajectory of functional, cognitive, and overall behavioral symptoms over time compared to those without psychosis [27]. Notably, approximately half of HD patients experiencing psychosis remain undertreated for these symptoms, as underscored by Van Duijn et al. (REGISTRY) [7]. Interestingly, Connors et al. reported in their cohort that patients with psychosis exhibited distinct motor symptoms compared to those without, displaying less chorea and poorer balance, even after adjusting for antipsychotic and tetrabenazine use [27]. To date, this finding awaits replication in further studies.

It is noteworthy that patients experiencing psychosis may be disinclined to participate in research studies, potentially contributing to the lower reported prevalence rates compared to other neuropsychiatric symptoms. Consequently, there is a pressing need for additional investigation into the management and

characterization of psychosis in HD to optimize patient outcomes and deepen our understanding of the disease spectrum.

Pathogenesis

Despite the identification of the specific genetic mutation underlying HD in 1993 (Huntington's Disease Collaborative Research Group 1993), the precise mechanism of its pathogenesis remains enigmatic. Nevertheless, insights gleaned from animal models have illuminated several functions of the HTT gene (encoding huntingtin), including its involvement in embryonic development, scaffolding protein functions, transcriptional regulation, and synaptic connectivity [28]. These findings have provided valuable clues to the intricate pathogenesis of HD and have paved the way for potential disease-modifying treatments.

A myriad of potential pathological mechanisms have been proposed, including the aggregation of mutant HTT gene, cleavage of mutant huntingtin protein into toxic fragments, transcriptional dysregulation, altered protein homeostasis, mitochondrial dysfunction, disrupted synaptic plasticity, defects in axonal transport, dysfunction of neuroglia, and cell-to-cell transmission of aggregates (prion-like transmission) [28]. Additionally, oxidative stress, inflammatory processes, and perturbations in neurotransmitter systems such as dopamine, glutamate, cannabinoid, and adenosine have been implicated [29]. However, the intricate interplay between these mechanisms and their contribution to significant behavioral dysregulation remain elusive. HD often manifests initially with non-motor symptoms, reflecting its complex neuropathology. The landmark TRACK-HD study, published in 2009, revealed that cognitive and neuropsychiatric dysfunction may precede motor symptoms by up to 11 years [30]. Subtle motor abnormalities, including clumsiness and balance disturbances, may precede or coincide with a spectrum of personality changes, behavioral disturbances, and psychiatric symptoms such as depression, psychosis, irritability, aggression, obsessive-compulsive disorder, and anxiety. Notably, behavioral alterations have been reported prior to the aggregation of mutant huntingtin in animal models [31]. This heterogeneity underscores the multifaceted nature of HD neuropathology.

While chorea has been linked to the loss of medium spiny striatal neurons projecting to the globus pallidum externus, alterations in GABA (A) receptor expression in the striosones of the striatum and the matrix compartments of striatal circuits have been associated with mood disorders [32]. Postmortem examinations have revealed neural loss and gliosis in the cortex and striatum, particularly the caudate nucleus, leading to progressive striatal atrophy, a hallmark neuropathology of HD. However, the precise relationship between brain atrophy and clinical manifestations remains elusive.

Behavioral changes observed in HD patients may be attributed, in part, to malfunctioning cortical-striatal circuits [33]. Recent studies suggest that layer-specific neuronal loss in the cerebral neocortex and allocortex targets of HD's pathogenesis is associated with neuropsychiatric and cognitive deficits [34]. These findings challenge the traditional view of HD as a "selective disease" of the striatum.

Degeneration of specific brain areas, such as the centromedian-parafascicular nucleus/intraluminal complex of the thalamus, has been implicated in cognitive and psychiatric symptoms due to their anatomical association with the striatum and limbic system. Alterations in thalamic nuclei connectivity with the prefrontal cortex may also contribute to cognitive and behavioral symptoms [34, 35]. Additionally, serotonergic brain stem-mesencephalic raphe structures have been implicated in the pathogenesis of depression in HD patients [36].

Dysfunction in the frontal lobe, including the prefrontal cortex and its connections to the caudate nuclei, may impair emotional control and expression, leading to impulsive emotional responses to environmental stimuli. This dysfunction may also manifest as apathy, disinhibition, or affective disturbances observed in HD patients [37].

Understanding the pathogenesis of HD provides a foundation for both symptomatic pharmacological treatment and potential disease-modifying therapy. Moreover, it facilitates the education of caregivers and family members, enabling them to comprehend and address the unique challenges faced by HD patients.

Management

Affective Disorders Management Including Behavioral Interventions (Table 1)
Despite the absence of randomized controlled trials (RCTs) specifically targeting depression in HD, treatment strategies can be adapted from approaches used in other neurodegenerative disorders, encompassing both pharmacological and nonpharmacological modalities.

Cognitive-behavioral therapy (CBT), which has shown efficacy in treating depression in Parkinson's disease, can be considered for appropriately selected HD patients without significant cognitive impairment [38]. Encouraging open communication about depression is vital, although some patients may be reluctant to engage in such discussions, particularly in later disease stages where communication difficulties may arise. Regular evaluation for depression and suicidal ideation during follow-up visits is essential.

Developing a crisis plan with patients and caregivers ensures preparedness to manage depressive episodes or suicidal thoughts effectively. Caregivers should be educated on the importance of listening empathetically to patients expressing suicidal ideation, as avoidance of these discussions can have detrimental consequences. Nonpharmacological interventions, such as pet therapy, offer potential benefits in improving mood and quality of life for HD patients, as observed in other neurodegenerative conditions [39]. Structured physical activity programs, preferably in a group setting, can also mitigate symptoms of apathy and enhance adherence. Music therapy represents another avenue for enhancing emotional well-being, particularly in patients with limited participation in other activities [40].

In assessing depression, routine laboratory testing may not yield diagnostic utility unless specific findings suggestive of underlying

metabolic or substance-related etiologies are present. Following the discontinuation or reduction of medications that may exacerbate depression (e.g., tetrabenazine), pharmacotherapy is often warranted. While evidence supporting antidepressant selection in HD remains limited (Class IV evidence), observational data suggest that selective serotonin reuptake inhibitors (SSRIs) and bupropion may offer superior efficacy [41]. Bupropion improves motivational anhedonia and synergizes with SSRIs in these patients. Starting with low doses and titrating gradually is advisable to enhance tolerability and compliance, with therapeutic doses typically exceeding those used in the general population. Patients must be advised of the potential short-term anxiety exacerbation when initiating SSRIs. If this happens, a short course of a low dose of benzodiazepine is advisable.

In selecting antidepressants, most experts start with SSRIs due to tolerability and safety profile (e.g., sertraline or escitalopram based on the clinical experience from the author). However, treatment decisions should be tailored to individual patient presentations, considering comorbidities and symptom profiles. For instance, mirtazapine may be preferred in cases with insomnia, depression, and weight loss, while bupropion may benefit patients with depression, apathy, and tobacco addiction. In cases of treatment-resistant depression or psychosis, augmentation with low-dose atypical antipsychotics, along with psychiatrist consultation, preferably with experience in neurodegenerative diseases.

Overall, a comprehensive and individualized approach to managing affective disorders in HD is crucial, integrating pharmacological and nonpharmacological interventions to optimize patient outcomes and quality of life.

Table 1 Behavioral Interventions to manage depression in HD
Cognitive behavioral therapy (Psychotherapy)
Encourage the patient to talk about depression.
Encourage social engagement (bear in mind HD support groups are not for everyone)
Pet therapy (calm dog breed ownership)
Music-art-creative therapy
Structured exercise activity (especially aerobic exercise)

Apathy Management

Apathy poses a significant challenge in the management of HD, often proving more distressing for caregivers than for patients themselves. Recognizing apathy as an intrinsic aspect of the disease, rather than a manifestation of laziness, is crucial for caregivers and families.

Initial assessment should include ruling out reversible causes such as metabolic disorders (e.g., hypothyroidism) and addressing any coexisting sleep disturbances. Distinguishing apathy from depression can be challenging, as they frequently coexist; however, they are distinct entities and may require different management approaches.

Pharmacological trials targeting apathy in HD have thus far yielded limited success. While no specific medication or psychological intervention has been validated for apathy in HD, strategies borrowed from other neurodegenerative diseases and expert opinions offer some guidance.

Establishing a structured, predictable routine and minimizing decision-making can help mitigate apathy-related symptoms. Encouraging patient engagement in activities with a partner can provide motivation and accountability. Consideration should be given to reducing doses of medications known to induce apathy, such as antipsychotics, selective serotonin reuptake inhibitors (SSRIs), and benzodiazepines, prior to initiating new treatment regimens.

While trials of selective norepinephrine reuptake inhibitors (SNRIs) or bupropion may be considered for their activating properties, caution is warranted. Recent research, including a multicenter, double-blind randomized controlled trial, found no significant benefits of bupropion in treating apathy in HD. Furthermore, antidepressants with activating effects should be used cautiously due to the potential exacerbation of insomnia and irritability in this patient population [42,43].

Irritability And Aggression Management

Irritability and aggression represent significant challenges in the management of HD, posing distress for both patients and caregivers. Despite their prevalence, evidence-based treatment strategies remain limited, relying largely on extrapolations from similar neurodegenerative conditions, expert opinions, and clinical observations.

Addressing these symptoms effectively often necessitates a multifaceted approach combining behavioral interventions and pharmacotherapy. Establishing a structured daily routine is paramount, as individuals with HD, particularly those experiencing cognitive decline, may struggle to adapt to changes in their environment. Caregivers should communicate any schedule modifications in advance to mitigate behavioral rigidity and minimize distress.

Table 2 provides a comprehensive overview of recommended behavioral interventions and environmental adjustments aimed at preventing and managing irritability in HD.

Pharmacological interventions may be required when non-pharmacological approaches prove insufficient. Selective serotonin reuptake inhibitors (SSRIs) are commonly utilized as first-line agents due to their favorable side effect profiles. However, in cases where irritability coexists with aggression and impulsivity, atypical antipsychotics such as olanzapine, risperidone, aripiprazole, or quetiapine may be warranted (e.g.,

olanzapine 5 to 10 mg daily, risperidone 2-8 mg daily, aripiprazole 10-15 mg daily, or quetiapine 50-200 mg daily or more if tolerated), especially when chorea is present. It should be noted that quetiapine is not usually effective in treating chorea due to its low affinity with D2 receptors.

Mood stabilizers like valproate, lamotrigine, or carbamazepine may offer additional options, although their use requires careful monitoring to avoid exacerbating movement disorders [44].

For patients with communication challenges, a trial of pain medication is advisable if other interventions fail to alleviate agitation or irritability [45].

Table 2: Behavioral intervention and environmental changes recommendations for caregivers to prevent and manage irritability in HD.
Educate caregivers to stay calm during those situations and not take it personally. Emotional sensitivity and lack of control are part of the disease, not a patient's choice.
Avoid confrontation, especially "ultimatums." Do not escalate the situation.
Allowing patients to express their feelings rather than reacting to their behavior is the best choice.
Redirect away from the possible source of anger or irritation, and using distraction techniques, such as changing the topic, is recommended.
Evaluate possible triggers (e.g., pain, uncomfortable environment noises or temperature, akathisia due to neuroleptics or serotonergic drugs, untreated mood, or sleep disorders).
Educate caregivers about the importance of having a structuralized schedule for these patients (home routine).
Avoid open-ended questions or questions with more than two options.

Obsessive/Compulsive and Perseverative Behavior Management

Once again, the management of OCBs and perseverative symptoms in HD poses a challenge due to the lack of high-quality evidence supporting specific treatment recommendations. Current guidance is primarily derived from expert opinion and case reports, which constitute a low level of scientific proof.

In instances where pharmacological intervention becomes necessary for perseverative symptoms following family education, selective serotonin reuptake inhibitors (SSRIs) are typically considered the first-line treatment option. This preference is particularly notable when perseverative symptoms are accompanied by depression or anxiety. However, if significant irritability is present alongside perseverative symptoms, atypical neuroleptics are generally favored.

For individuals grappling with OCBs, cognitive behavioral therapy (CBT) is often recommended as the initial approach, provided there is no significant cognitive impairment. Alternatively, if cognitive deficits are present, SSRIs are typically favored as the primary pharmacological intervention [44].

Moreover, some experts suggest considering clomipramine, a tricyclic antidepressant with potent serotonergic activity, as an alternative treatment option for OCBs in HD [46].

Psychosis

Acute psychosis in HD typically warrants a multifaceted approach to management, akin to strategies employed in the general population. Initially, clinicians must diligently rule out potential precipitating factors such as infections, metabolic disorders, drug-induced psychosis, and acute brain insults. Key elements of the nonpharmacological management of psychosis in these patients are summarized in Table 3.

Following the evaluation and treatment of secondary or underlying factors, the primary pharmacological intervention often involves atypical (second-generation) neuroleptic agents. These agents are considered the first-line treatment when hallucinations or delusions significantly impact function or safety. Given the debilitating nature of psychosis in HD, clinicians, including the author, commonly prescribe medications such as olanzapine, risperidone, quetiapine, and aripiprazole as initial choices. This recommendation is informed by case reports, case series, and clinical expertise [42]. In cases where patients exhibit inadequate responses to multiple antipsychotics or present with the akinetic (parkinsonism) form of HD, clozapine may be considered as an alternative. However, its use necessitates regular monitoring for agranulocytosis through frequent interval blood testing [42,45].

Table 3 Nonpharmacological management of psychosis in HD
Evaluation of secondary causes such as medication side effects, infections, metabolic dysregulation, substance abuse, and drug withdrawal.
Assessment and treatment of concurrent psychiatric symptoms such as depression, obsessive-compulsive behaviors, anxiety, and agitation/irritability.
Evaluate and treat for sleep disorders.
Evaluate for visual or hearing impairment

Conclusion

HD exerts a profound impact on multiple systems, directly and

indirectly affecting patients and their families. The diagnosis, or even the suspicion of having HD, significantly impacts the mental health of individuals and their loved ones. Regular monitoring is essential to identify neuropsychiatric symptoms that impair function and diminish quality of life across various domains. These behavioral manifestations are often socially debilitating, pose life-threatening risks, and cannot be adequately managed through environmental modifications alone.

While evidence-based reviews have not identified randomized controlled trials supporting specific treatments for depression, psychosis, irritability, apathy, and suicidality in HD, and no disease-modifying interventions have been established, there are avenues to enhance the quality of life for HD patients and their caregivers [47]. It is crucial to recognize that education plays a pivotal role, not only for those directly involved in patient care, who often become experts by necessity, but also for the broader community. By fostering understanding and support, we can better address the complex challenges posed by HD and strive to improve outcomes for those affected by this devastating condition.

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Conflict Of Interest

The authors declare no conflict of interest.

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