

THE NEUROBIOLOGY OF PERSONALITY DISORDERS

Overview

Neurologists and primary care doctors manage patients with a wide range of psychiatric disturbances to include personality disorders. The definition of a personality disorder encompasses individuals with interpersonal or psychosocial dysfunction that impairs their social or professional function. Personality disorders are common in the general population occurring in 1-2% of the adult population; however, these statistics are somewhat bounded by culture and socioeconomic variables. The patient with personality disorder may frustrate care, provoke the clinician or consume large amounts of the practitioner's time. Comorbid substance abuse is common in persons with specific types of personality disorder creating the management problem of drug-seeking behavior, e.g., sociopaths. Personality is a complex mixture of affect, temperament, cognitive style, social skills, and impulse control. Personality is a mixture of brain biology and developmental experiences from childhood and adolescence.

Diagnosis

The diagnosis of personality disorders requires a careful clinical history, physical and neurological examination, as well as mental status examination. The diagnosis of personality disorders is based upon a longitudinal history of dysfunctional interpersonal relationships that cause impairment of function. This diagnosis requires a carefully detailed history of social, personal, sexual, and professional behaviors. Personality disorders often present as intact "normal" individuals. The features that produce dysfunction, e.g., irritability, impulsivity, antisocial activities etc., often become apparent to the clinician overtime. The diagnosis of personality disorder is based on a longitudinal history that is confirmed by other sources, e.g., family, employer, as many individuals will distort or misrepresent their history. Many physical and neurological disorders can produce abnormal behavior and the clinician must exclude all potential physical causes for the symptoms. A diagnosis of personality disorder implies the absence of mental illness that would produce identical symptoms. For example, depressed patients may be apathetic, disinterested, and unwilling to work; however, this does not indicate some form of antisocial or avoidant behavior. The diagnosis of personality disorder can

co-exist with mental illness and this feature is apparent after the mental illness is adequately treated. Psychological testing can sometimes benefit the clinician and the MMPI has specific quantitative indicators to identify histrionic narcissistic and antisocial personality features among many. A skillful psychometric tester can generally predict the kind of personality features and disorder present. The presence of annoying personality features does not indicate a disorder and the clinician must demonstrate that the symptom disrupts the normal life of the individual. Personality disorders should never be diagnosed on a single interview or in the emergency room. The diagnosis is best accomplished by either a psychiatrist or a trained psychologist. Individuals with personality disorders are usually not psychotic. These persons are legally and socially responsible for decisions that produce serious life consequences. Although inclined to dysfunctional or disruptive behavior, these persons are able to comprehend the consequences of their behavior.

Biomedical Psychosocial Aspects Of Personality Disorders

The biomedical, psychosocial aspects of personality disorders are quite complex. The biological aspects of personality disorders probably relate to alterations of cortical circuits that mediate impulsivity or social behavior. Many studies suggest abnormalities in the limbic system; however, the diagnostic criteria for personality disorders are sufficiently imprecise to obscure clinical pathological relationships. The biological aspects personality disorders also include genetic predisposition to the disturbance as well as psychiatric comorbidity such as mood disorders. Many severe personality disorder patients have comorbid substance abuse with the resulting brain changes produced by alcoholism, etc. The medical aspects of personality disorders focus on high-risk behaviors that increase the likelihood of communicable disorders such as STD's or HIV infection. The comorbid substance abuse produces the typical health problems related to IV drug abuse or alcoholism. The psychological aspects of personality disorders dominate the disease. The Axis I disorders can be viewed as structural brain abnormalities or "hardware" problems, while the Axis II disorders can be viewed as "software" problems resulting from childhood stressors, learned maladapted behaviors, and other psychological problems. The social aspects of personality disorders center on the aftermath of impulsive hostile or disruptive behaviors. Many persons with personality disorders face social alienation, rejection, and difficulty maintaining financial stability. The social consequences of many behaviors include legal problems, or incarceration.

Personality disorders generally occur in younger patients and this condition emerges in the post-adolescent young adult. Teenagers have not completed psychosocial development and therefore a permanent disruption of normal function cannot be confirmed until adulthood. Many behaviors associated with adult personality disorder resemble common adolescent behaviors, e.g., emotional lability, poor impulse control. Personality disorders can also result from neurological diseases – especially traumatic brain injury. The symptoms of personality disorders generally persist into late life, although the intensity of manifestations may be mediated through years of conditioning and psychosocial education. Individuals with personality disorders frequently have other psychiatric morbidity, including anxiety or mood disorders as well as somatoform disorders. The diagnosis of many personality disorders, e.g., antisocial, borderline, histrionic, etc., carries a significant negative connotation in the healthcare system, and these diagnoses should only be affixed by a psychiatrist with detailed longitudinal knowledge of the individual. Many patients with serious mental illness may manifest symptoms of personality disorder during an acute psychiatric illness and these symptoms will improve with correction of the underlying major mental illness. For example, manic patients may demonstrate some antisocial behavior that promptly improves with treatment of the mania.

The Neurobiology of Personality

The antisocial personality disorder is a common condition that exemplifies issues of understanding the neurobiology of personality.

Postmortem studies on antisocial personality disorders demonstrate conflicting results. Some evidence of developmental abnormalities in the amygdala was identified in serial killers undergoing postmortem examination; however, these individuals may have also suffered from other disorders, e.g., substance abuse or depression, which would alter brain structures. No compelling neuropathological studies exist that document specific pathology associated with antisocial behavior. Failure of insight is a key clinical feature for most other personality disorders. Regardless of symptom clusters, individuals with personality disorders exhibit variable inability to understand the impact of their behavior on others. This insight failure diminishes the individual's capacity to self-monitor and self-examine. Insight is a very sophisticated psychological function that synthesizes input from multiple brain regions. Insight requires that an individual accurately measure their behavior and then compare this behavior to accepted social norms and determine whether the behavior is appropriate to the

circumstance. Emotional, intellectual, and social insight mirror emotional, intellectual and social domains inherent to human mental life. Persons with borderline personality disorders fail to assess their internal emotional content, while psychopathic individuals fail to demonstrate social insight.

Individuals with personality disorders have normal neurological examinations and unremarkable cognitive testing except for very specific exceptions. Many types of brain injury can produce organic brain personality disorders that frequently present with antisocial symptoms. These syndromes probably result from damage to frontal lobe structures.

The causes of personality disorders probably include a complex mixture of genetic, environmental, and developmental features that culminate in the expression of this dysfunctional behavior. Specific types of personality disorders have genetic loading while many are related to childhood or early adolescent psychological damage. Sexual abuse and physical mistreatment are common antecedents for Cluster B that probably produce significant psychological and physical stress during key phases of brain development. The psychodynamic explanation of personality disorders focuses on the role of the latency period, i.e., ages 5-12, on development of normal human relationships. Massive psychological trauma during the latency phase may disrupt the person's ability to learn how to maintain normal friendships or relationships as well as monitor the success of those social interactions.

Diagnosis And Treatment Of Common Personality Disorders

The personality disorders are divided into three broad categories or clusters, i.e., Cluster A, Cluster B, and Cluster C. The personality disorders have the least diagnostic validity and group accuracy of the major psychiatric diagnoses. Some individuals have personality traits, i.e., isolated symptoms within a specific disorder that do not disable the individual from the professional or interpersonal standpoint.

Cluster A

Cluster A includes the schizoid schizotypal and paranoid personality disorders. These diagnoses are now considered within the schizophrenic spectrum in which psychosis is not present; however, many odd personality traits dominate the individual. Schizoid personality tends to be distant, aloof individuals with impaired spontaneity. Schizotypal individuals tend to demonstrate peculiar magical thinking without hallucinations. Structural

and functional brain imaging on individuals with Cluster A demonstrate subtle abnormalities similar to those present in persons with schizophrenia. Family pedigrees of persons with schizophrenia demonstrate higher rates of Cluster A symptomology. These individuals also manifest higher rates of subtle neurological soft signs consistent with the picture seen in persons with schizophrenia. Patients with Cluster A personality disorders occasionally benefit from antipsychotic medication. These individuals can develop psychosis or depression as well as substance abuse. The Cluster A personality disorder is the most biological determined of the three personality Clusters.

Cluster B

Cluster B includes narcissistic borderline, histrionic and antisocial personality disorders and this grouping includes most individuals with personality disorder. The B Cluster encompasses individuals with difficult and often disruptive symptoms that can disrupt inpatient units. These individuals demonstrate high rates of substance abuse producing frequent calls to request prescriptions – especially controlled substances. Many individuals with B Cluster symptoms were the victim of childhood physical or sexual abuse and these individuals often have legal as well as medical problems. Poor impulse control is a prominent feature of Cluster B disorders. Impulse control is a complex intellectual function involving cortical, subcortical, and brain stem regions. Some impulse control disorders are seen in persons without personality disorders (See Table ____). Functional and structural brain imaging studies demonstrate dysfunction in orbito-frontal cortex, cingulate cortex, nucleus accumbens, and amygdala. Poor impulse control involves poor judgment in measuring the consequences of decisions and inability to learn from previous experiences. Dopaminergic GABA-ergic and serotonergic systems are linked to managing impulsive behavior and moderating the arousal response.

Impulse Control Disorders

- Pathological Gambling
- Intermittent Explosive Disorder
- Kleptomania
- Pyromania
- Trichotillomania

Borderline Personality Disorder

The borderline personality disorder combines emotional lability with poor impulse control to produce a sometimes volatile patient and accounts for over half of these diagnoses. Borderline personality disorder includes lability of affect, intense feelings of loneliness, and boredom, failure to form normal personal relationships, self-mutilating behaviors such as slashing, dangerous impulsive behaviors such as sexual promiscuity or substance abuse, and constant need for psychological support. Borderline personality disorder patients demonstrate splitting or black and white behavior with medical treatment teams. Splitting is the creation of conflicts between segments of the clinical care team with one group or individual pitted against another by the patient. For example, such individuals will convince day shift that night shift is mean or inappropriate to the patient. Black and white behavior involves inflation of the clinician's worth while the doctor is perceived as gratifying the patient's needs with subsequent total rejection when the clinician fails to meet the patient's demands. For example, the patient who informs the doctor that "they are most wonderful physician and the first individual that understands the patients problem", followed a week later when the patient demeans the physician for not showing sufficient attention or concern, i.e., "you are just like all the rest." Borderline personality disorders have high rates of suicide attempts, aggressive behavior, drug-seeking behavior, promiscuity, or involvement in dangerous behaviors such as exotic dancing, drug-dealing, etc.

Structural and functional brain imaging studies on persons with borderline personality disorder show reduction in the volume of the hippocampus similar to that seen in persons with depression. These changes probably result from stress-induced hyper secretion of cortisol during childhood or adolescent. The treatment of borderline personality disorder includes long-term psychotherapy to develop insight for the individual as well as pharmacological therapy of depression and impulsive behavior. Prescription of narcotics and benzodiazepines should be carefully monitored and controlled because of the high risk for abuse and suicide. Borderline personality disorders are best managed by psychiatrists. Neurologists or primary care doctors should manage these difficult individuals with an experienced psychiatrist.

Histrionic Personality Disorder

Persons with histrionic personality disorders will demonstrate flamboyance of style and lability of affect. These patients may present with dramatic symptoms and affect. These patients form empty, shallow relationships that often produce interpersonal disconnection. Substance abuse and mood disorders are common for these individuals. The neurobiology of histrionic personality disorders is unknown. Treatment for histrionic personality disorders include long-term psychotherapy and management of associated mood disorders or substance abuse.

Narcissistic Personality Disorder

The narcissistic personality disorder is less common and centers on self-inflation with intense sensitivity to criticism, rejection, or loneliness. The narcissistic personality disorder is best treated with long-term psychotherapy and has no specific neurobiology associated with the symptomology.

Antisocial Personality Disorder

Antisocial personality disorder is a common psychiatric problem encountered in most emergency rooms and prisons. Many career felons suffer from this disorder. The essential clinical features of the antisocial personality disorder include: 1) the inability to conform to social or legal norms, 2) a lack of empathy with victims and 3) a sense of social entitlement for inappropriate social or legal behavior. The typical antisocial personality disorder demonstrates failure to maintain jobs, interpersonal relationships, and self-control with subsequent arrests or convictions for criminal activity. Alcohol and other substance abuse are common comorbidities. Antisocial personality disorders are prone to aggressive or violent behavior and these individuals occupy many prison beds. Most sociopaths continue to manifest these symptoms into late life and most demonstrated some symptoms as children or adolescents, i.e., conduct disorder. Adolescents with ADHD have a significantly higher risk for developing ASP but this predisposition may be environmental, i.e., the product of chronic discipline problems. Most sociopaths have normal or slightly above normal intellect and these individuals are adroit at manipulating the healthcare system to achieve specific goals, e.g., release from prison, acquisition of control substances, etc. The neurobiology of antisocial personality disorders demonstrates dysfunction in the frontal lobes and some structural imaging suggests abnormalities of limbic structures, e.g., amygdale. Many sociopaths come from families with past history of the antisocial behavioral problems.

Antisocial personality disorder is not an excuse for criminal behavior because the sociopaths understand right from wrong and the criminality of their actions. Sociopaths do not adhere to norms imposed by society. A specific gene or biochemical lesion has not been linked to criminal behavior. Criminality is a complex mixture of genetic or developmental predispositions coupled with environmental factors.

Effective treatment of antisocial behavior is poorly understood. Sociopaths respond to highly structured environments with clear, swift punishments for unacceptable behavior. Pharmacological interventions are ineffective in preventing antisocial behaviors. These individuals have high risk for substance abuse and suicide. Consequently, prescription of controlled substances should be carefully monitored. Antisocial personality disorders respond poorly to individual or group psychotherapy; however, other comorbid conditions such as depression, are treatable with standard medications.

Cluster C

The Cluster C includes passive, dependent, and obsessive-compulsive avoidant personality disorders. These poorly characterized individuals use withdrawal, avoidance, or self-defeating behaviors to manage interpersonal stress. Structural and functional brain imaging studies are not available for these individuals and postmortem examinations have not been performed on these individuals.

Organic Personality Disorder

Many individuals who sustain serious brain injuries may develop personality disorders. The organic personality disorder is diagnosed when a psychological or behavioral change has occurred following a clear brain injury and the symptoms are not produced by a secondary serious mental illness, such as mood disorder, schizophrenia, etc. Many individuals who sustain orbitofrontal wounding following traumatic brain injury, e.g., contracoup wounding, may exhibit features of an organic personality disorder. These individuals are less amenable to psychotherapy and some symptoms produced by the brain injury can be treated with pharmacological interventions. For example, the individual with impulsive antisocial behavior following head trauma may be treated with anticonvulsants, mood stabilizers, etc.

TABLE _____

CLUSTER	TYPE	ALTERATIONS OF STRUCTURAL/FUNCTIONAL IMAGING	SOFT SIGNS ON NEURO EXAM	PRIMARY THERAPY
A	Schizoid	+	+	Neuroleptic
	Paranoid	---	---	Combined
	Schizotypal	+	+	Neuroleptic
B	Antisocial	+	--	Psychotherapy
	Borderline	+	--	Combined
	Histrionic	--	--	Combined
C	Avoidant	?	--	Psychotherapy
	Obsessive-Compulsive	?	---	Psychotherapy

FACT SHEET ON PERSONALITY DISORDERS

1. Personality disorders are common in the general population (1-2%) and afflict all racial, ethnic, and gender groups.
2. The diagnosis of personality disorders require detailed knowledge of the person's longitudinal history as gathered by an experienced observer as well as the absence of another serious mental illness.
3. Personality disorders produce mal-adaptive professional, personal and social behaviors that disrupt the individual's normal life.
4. Persons with personality disorder frequently manifest failure of insight and social judgment with no evidence of cognitive deficit or neurological findings.
5. Personality disorders are divided into three broad clusters: 1) Cluster A-- symptoms associated with abnormalities of thought, 2) Cluster B – symptoms associated with abnormalities of emotional modulation, and 3) Cluster C – symptoms associated with avoidance or withdrawal.
6. Cluster A disorders include schizoid and schizotypal, which fall within a spectrum of disorders associated with schizophrenia.
7. Individuals with Cluster B demonstrate problems with modulation of emotion, e.g., borderline and histrionic personality disorder as well as modulation of impulse control, e.g., antisocial personality disorder.
8. The Cluster B personality disorder may demonstrate comorbid substance abuse, drug-seeking behavior, or disruptive behaviors on the inpatient unit.
9. Cluster B personality disorders may benefit from antidepressants or anti-impulse medications, e.g., Tegretol, when such symptoms exist; however, addictive drugs should be carefully monitored when prescribed for these individuals.
10. Cluster B personality disorders respond best to structured long-term individual or group psychotherapy.
11. Antisocial personality disorders rarely respond to any form of therapy and persist into late life.
12. Cluster C disorders are uncommon and require psychotherapy.