Wernicke-Korsakoff Syndrome (WKS) and Deficits Associated with Memory: An Introduction for Clinical and Forensic Professionals

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Abstract

Chronic alcohol abuse has been shown to lead to a number of cognitive, behavioral, and developmental deficits. One of the possible consequences of this abuse is Wernicke-Korsakoff Syndrome (WKS), a condition characterized by a deficiency of thiamine (vitamin B_1) that impairs various neurological functions, particularly memory and its various stages (i.e., storage and retrieval). Management of WKS requires a deeper understanding of memory processing as well as carefully structured therapy methods that cater to the unique needs of impacted individuals. Therefore, accurate and reliable identification coupled with early intervention strategies for this population is a clinical and forensic priority.

Introduction

Wernicke-Korsakoff Syndrome (WKS) is a neurological disorder caused by a deficiency in thiamine (vitamin B_1) and is commonly seen in individuals who chronically abuse alcohol (Isenberg-Grzeda, Kutner, & Nicolson, 2012; Nahum et al., 2015; Scalzo, Bowden, Ambrose, Whelan, & Cook,
Wernicke-Korsakoff Syndrome (WKS) and Deficits Associated with Memory

Wernicke-Korsakoff Syndrome (WKS) may be overly represented in chemical dependency treatment programs, detoxification centers, and other settings that serve at-risk individuals who struggle with the challenges of chronic alcohol use (Brown et al., 2015; Delaffon et al., 2013). One of the many consequences associated with WKS are problems related to memory. Impairments in memory tend to manifest as short-term memory deficits and an inability to retrieve learned information independently. Even when assistance is provided to aid memory, an individual suffering from WKS may continue to forget items. Additionally, memory can be inconsistent when discussing family information and personal history. Individuals may provide inaccurate reports about the past even when provided with documentation that presents conflicting data. Individuals may appear confused during individual and group therapy sessions and often require consistent redirection. As a result of these memory impairments, effective methods of screening, assessment, treatment planning, and therapy can be very challenging for this population (Nilsson & Sonne, 2013).

To better understand WKS, it may be helpful to learn more about how most individuals retain information. Memory is composed of multiple systems, each with a different neuroanatomy and set of operating principles (Squire, 2009). Learning and memory skills can be assessed by tests that measure free recall, rote learning, remote memory, and recognition (Lezak, Howieson, & Loring, 2004). Free recall is the repeating back of information that is presented. This can be done as an immediate response after the information is given and also after a delay of 20 to 30 minutes. Rote learning is the amount a person is able to learn if the same information is repeated multiple times. Remote memory is measured by asking individuals what and how much they remember about something after a time delay, which could be minutes after a presentation or years after a particular event (e.g., their 16th birthday party). Recognition conditions are similar to multiple choice tests in that the correct answer must be selected from a number of possible choices (Squire, 2009). Individuals demonstrate good recognition by identifying correct information and separating it from incorrect information. Assessment of these areas is especially important for cases involving individuals who have histories of chronic alcohol use and problems with subjective reports of memory. Individuals with dementia related to nutritional deficiencies resulting from patterns of alcohol consumption tend to have discrepancies between free recall and recognition (Kopelman, Thomson, Guerrini, & Marshall, 2009). Retrieval deficits may present themselves in the form of confabulations.

Individuals with WKS may show a flat learning slope when presented with the same information over and over again (Lezak, Howieson, & Loring, 2004). Even after a 20-minute delay, recall may still be low and confabulation may be observed. It is also possible for an individual with WKS to remember less
information as the number of repetitions increases. A recognition condition would show the impacted individual retaining some information, but also exhibiting confusion by including additional, erroneous information (Lezak, Howieson, & Loring, 2004). Overall, individuals with WKS tend to show a limited ability to absorb new information and retrieve it again at a later time. This may be the result of difficulties with effectively organizing newly learned information, translating to an inability to learn new information appropriately. When individuals with WKS attempt to freely recall information, they trend toward confabulation in a desire to fill in gaps of missing information. Individuals with WKS may also demonstrate an inability to inhibit inappropriate responses (Kopelman et al., 2009). Recall and retrieval deficits such as these are predominant in the memory profile of individuals with WKS.

Significant deficits in executive functioning may appear as impairments in attentional processes that aid in the shifting of thought to complete a task. The speed of mentation or the ability to quickly solve problems may be limited in those with WKS (Lezak, Howieson, & Loring, 2004). Furthermore, when these individuals are provided environmental structure and immediate feedback on test tasks, their ability to appropriately respond to reward characteristics (feedback) of test parameters may be compromised. Reliance on the environment for feedback impacts one’s ability to make good judgments consistently (Lezak, Howieson, & Loring, 2004). Language skills tend to remain intact, and problems with communication are related to memory issues rather than word-finding deficits.

Conclusion

Wernicke-Korsakoff Syndrome (WKS) is a highly damaging condition that hinders behavioral and cognitive development. The deficits associated with WKS have significant implications for clinical and forensic settings. Individuals with WKS often exhibit problems with memory encoding, storage, and retrieval, resulting in compensatory strategies such as confabulation or even pure fabrication. Additionally, the condition can impair higher executive functioning and can lead to cascading effects that hinder future development. Specially designed programs and an increased awareness among clinical and forensic professionals of WKS may help to improve the identification and treatment of this highly vulnerable and underserved group of individuals.
Biographies

Jerrod Brown, M.A., M.S., M.S., M.S., is the Treatment Director for Pathways Counseling Center, Inc. Pathways provides programs and services benefiting individuals impacted by mental illness and addictions. Jerrod is also the founder and CEO of the American Institute for the Advancement of Forensic Studies (AIAFS), and the Editor-in-Chief of Forensic Scholars Today (FST) and the Journal of Special Populations (JSP). Jerrod holds graduate certificates in Autism Spectrum Disorder (ASD), Other Health Disabilities (OHD), and Traumatic-Brain Injuries (TBI). Jerrod is certified as a Youth Firesetter Prevention/Intervention Specialist, Thinking for a Change (T4C) Facilitator, Fetal Alcohol Spectrum Disorders (FASD) Trainer, and a Problem Gambling Treatment Provider. Jerrod is currently in the dissertation phase of his doctorate degree program in psychology.

Dr. Charlotte Gerth Haanen has worked in the field of psychology with a variety of populations, including children, adolescents, and adults. This has involved work with at risk and adjudicated adolescents, children with emotional and behavioral disorders, adults with serious and persistent mental illness, and both adults and children with developmental disabilities. Services provided have included individual and group therapy, testing, and clinical assessments. Dr. Gerth Haanen has worked for the Minnesota Department of Corrections as a psychologist since 2005. This began in a maximum security prison completing forensic and neuropsychological assessments for the mental health unit. This included providing expert testimony on a regular basis for civil commitments as mentally ill and also mentally ill and dangerous.

Matthew D. Krasowski, MD, Ph.D., is a pathologist and Director of Clinical Laboratories in the Department of Pathology at the University of Iowa Hospitals and Clinics. He is a Clinical Associate Professor at the University of Iowa. He has interest in drugs of abuse and mental disorders. He is co-director for a pre-clinical course for medical students in the University of Iowa Carver College of Medicine.

Dr. Deborah A. Eckberg, Ph.D., is an Associate Professor of Criminal Justice at Metropolitan State University (MN) and the Director of the Master of Science in Criminal Justice program. Dr. Eckberg’s research and teaching interests span a wide range of topics related to criminal courts, special populations in the criminal justice system, and program evaluation.

Cameron R. Wiley is a fourth-year undergraduate student attending Ohio State University and pursuing a Bachelor of Science in Psychology with a minor in Neuroscience. Cameron has an expected graduation date of December 2016. As an active member of campus, Cameron is an Undergraduate Research Assistant in the Emotions and Quantitative Psychophysiology lab of the Department of Psychology, a Certified Personal Trainer in the Department of Recreational Sports, and an Office of Diversity and Inclusion Scholar. He is employed as a Lab Support Associate at Nationwide Children’s Hospital. Cameron intends to pursue a Ph.D. in Clinical Psychology to continue with his current research and ultimately become a Neuropsychologist.
References


