Phenomenology of Coarse Brain Disease

William Meller, MD, William Sheehan, MD, and Steven Thurber, PhD

Abstract  Two previous chapters on the phenomenology of coarse brain disease are briefly reviewed and important organizing principles are delineated. The central focus of the chapter is on traumatic brain injuries and cerebrovascular accidents. Historically germane dichotomies are discussed (organic/functional; mind/body distinctions) together with the notion of “specific etiology.” Certain topics from the earlier chapters are updated; neuroimaging and war-related brain injuries are added.

Keywords  Blast injuries · Brain insults · Dementia · Neuroimaging · Organic disorders

1. Introduction

There have been two earlier chapters on the phenomenology of coarse brain disease. The first, authored by Abrams, Taylor, and Sierles (1), focused on the lobes of the cerebral cortex and the distinctive psychiatric symptoms that emerge with respective lobe dysfunctions. Additionally, they presented an excellent discussion on areas of the brain that subserve language and memory functions. They also presented valuable information, still germane, regarding simple, reliable tests that can readily be implemented by physicians for inferences about possible organic involvement. The chapter is rich with “bedside” procedures for screening dysfunctions in each of the cerebral lobes as well as for nonlocalized or so-called soft neurological signs. Therefore, these authors took a practical, localization perspective. In the next edition (1994), Robinson (2) placed emphasis on brain disorders associated with demonstrable structural change, with topics limited to dementia, delirium, mood and anxiety disorders, hallucinations, and delusions. The organization and content of this chapter was geared to disorders commonly seen by psychiatrists in the domains of cognitive, affective, and perceptual disorder manifestations, but with instances in which such disorders are found to have a palpable organic base. A large proportion of the chapter was devoted to neurological underpinnings of depression.

Components of both earlier chapters retain relevance and are recommended reading. Our chapter is meant to supplement and, in some instances, extend the topic of coarse brain disease to areas of current concern to practicing psychiatrists. We will look at the brain largely as an integrated, holistic organ with regard to recent data on the deleterious effects of trauma and disease processes on brain functioning. We question the relevance of the functional/organic dichotomy and the Cartesian separation of mind and body and opine that there is an increasing “blurring” of the distinction between modern psychiatry and neurology. Further, it is axiomatic that brain processes are involved in all psychiatric disorders; the issue is that of Meehl’s (3) “specific etiology.” Does an organic cause potentiate all other possible causal factors in relation to psychopathology? We will center our coverage on two fundamental conditions that produce coarse brain pathology, traumatic brain injuries (TBIs) and cerebral vascular accidents (CVAs), and will touch on brain imaging techniques that are of increasing importance in psychiatry. Our emphases are based on the dramatic increase in brain insults, including war-related blast injuries, and advances in understanding of the mediators of the intensity and extension of traumatic and vascular insult effects. We will also present updated information on topics from the previous chapters.

2. Background

The term “coarse brain disease” is somewhat analogous to the now-abandoned Diagnostic and Statistical Manual of Mental Disorders (DSM), 3rd edition (DSM-III) concept of “organic mental syndrome,” which was rejected by DSM-IV on the grounds that it introduced more confusion than it resolved, and in recognition of the fact that the use of the term implied
that “nonorganic” mental disorders did not have a biological basis.

Disorders involving “coarse brain disease” are those in which there is demonstrable structural change. They include a bewildering array of neuropathologic conditions ranging from CVA and TBI to Parkinson’s disease, Alzheimer’s disease (AD), Huntington’s disease, seizure disorders, and other, less commonly occurring neurologic disorders. In DSM-IV, they comprise, with the exception of the dementia, the category Axis I secondary to Axis III disorders. This innovation, introduced by DSM-IV as an alternative to the “organic mental syndrome” category, has proven to be somewhat cumbersome in practice because the perfect nosology is yet to be developed. Suffice it to say, psychiatric manifestations can and usually are present in just about any medical or neurological syndrome.

Nevertheless, many of the disorders described in this chapter have traditionally been viewed as belonging to the realm of neurology rather than psychiatry. Although historical considerations are largely discounted by textbook authors, the conceptualization of any field owes less to innovators and more to tradition—accidents of history—than we willingly admit. Since the nineteenth century, psychiatry and neurology classically separated along a “Great Wall” dividing supposedly “functional” from “structural” disorders. Although this separation is as anachronistic as the Cartesian mind/body dichotomy, it still lives and flourishes; it continues to inform academic medical curricula, boundaries between medical specialties, and the economic underpinnings of healthcare (“functional” disorders, falling in the province of “mental health,” have traditionally been paid for with public-sector money, “structural” disorders, along with the rest of “physical medicine,” have been paid for with private money, such as insurance).

Although disorders of coarse brain disease are traditionally considered the province of neurology, their evaluation and treatment will necessarily largely fall to psychiatrists. All of these disorders present with significant psychiatric and behavioral manifestations, including, but not limited to, depression, psychosis, alcohol and other drug dependence, and personality changes. Indeed, often, the psychiatric and behavioral manifestations constitute the most evident and debilitating aspects of the disease process. It is important to emphasize that all of these disorders can present with a complex mélange of symptoms that cut across diagnostic categories. The brain is complex and every brain injury is different. In some cases—such as severe head injury or CVA—symptoms may be incapacitating and immediate; in others, such as dementia or as the sequelae to neurologic disorders, such as Huntington’s disease, Parkinson’s disease, or mild TBI, they may not show up for days or weeks or years. They may be intermittent and at least partly reversible, as with seizure disorders, or they may be progressive and irreversible, as with AD.

The scope of these disorders is obviously much too vast to be considered in one chapter; indeed, each of the disorders mentioned could easily command a voluminous textbook unto itself.

It should be mentioned that damage occurring in coarse brain disease is seldom limited to a single region of the brain; thus, the syndromes described tend to be rather eclectic. The etiologies involved can all produce diffuse as well as localized damage.

In some cases, the features of these syndromes are highly characteristic. The hippocampal region in the medial temporal lobe, which is important to human memory functions, is particularly vulnerable to injury through CVAs, anoxia, and encephalitis; injury to the language areas of the left hemisphere are, because of the importance of language to most forms of human intercourse, usually dramatic and so incapacitating as to call forth an immediate flurry of vigorous rehabilitation efforts. Other syndromes, such as those affecting the parietal lobe of the nondominant hemisphere, may be subtle or even silent and go undocumented.

3. Traumatic Brain Injury

Called the “silent epidemic,” TBI affects nearly 1.5 million individuals in the United States each year. Of those, more than 1.1 million individuals are evaluated and treated in 435,000 emergency room visits; 235,000 are hospitalized and survive, a number that is 20 times the number of hospitalizations for spinal cord injury (4). Fifty thousand people die from TBI each year, making it currently the fourth-leading cause of death in the United States. Although constituting only 10% of cases, use of firearms account for 44% of TBI-related deaths.

Some 13,000 children receive services for TBI in public schools, and it is estimated that nearly 3.5 million people in the United States live with TBI-related disabilities (4). The impact in terms of human suffering and economic loss is staggering: TBI-related costs to the US economy have been estimated at $56 billion a year (5).

Tragically, these injuries preferentially affect the young. They strike down individuals in the prime of life, and the disabilities, suffering, and costs resulting from TBI carry forward for decades. Adolescents and young adults between ages 15 and 24 years are at highest risk, because of their high likelihood of being involved in vehicular crashes, acts of violence, and sports-related injuries (it is estimated that 300,000 cases of mild to moderate TBI occur each year in sports alone). Alcohol is associated with half of all TBI, involving either the person causing the injury or the one under the influence. Rural–urban populations have consistently demonstrated higher incidence of TBI in rural settings, and residents of rural remote counties have the highest overall incidence of TBI and the highest mortality rates (4).

It is self-evident that behavioral factors frequently contribute to the occurrence of TBI. The involvement of alcohol and other drugs has already been noted, as has the use of firearms. Firearm-related TBI often occurs in the context