Proceedings of the 7th International Conference on Education Innovation and Philosophical Inquiries
DOI: 10.54254/2753-7048/2026.33974

Organic Brain Lesions and New-Onset Criminal Behavior: Rethinking Traditional Explanations of Behavior

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Abstract. In recent years, the relationship between organic brain lesions and new-onset criminal behavior has gradually attracted attention. This article reviews relevant research, and focuses on the main manifestations and possible mechanisms of new-onset criminal behavior related to organic brain lesions and its significance in responsibility identification and practical response. Existing studies show that such behaviors are heterogeneous in nature, but may be manifested as aggression, theft, traffic violations, inappropriate sexual behavior and other serious deviations, and are related to changes in behavioral regulation, impulse control, social cognition and judgment ability. This article believes that the understanding of such behavior should not be limited to the superficial judgment of whether it is illegal or not, but should be analyzed more carefully in combination with the characteristics of lesions, the process of behavioral change and the clues of neuropsychological function. The discussion of this issue not only helps to deepen the understanding of the relationship between brain pathology and abnormal behavior, but also provides some reference for judicial judgment, clinical evaluation and practical management.

Keywords: Organic brain lesions, new-onset criminal behavior, impulse control, social cognition, criminal responsibility

1. Introduction

Organic brain damage is usually first discussed in medical or neuroscientific contexts, but its effects are not limited to cognitive, emotional, or daily functional levels. In some cases, individuals who have no history of criminal behavior or mental disorders may begin to show aggression, theft, traffic violations, inappropriate sexual behavior, or other serious transgressive acts after brain injury. This phenomenon suggests that some newly emerging serious behavioral problems may not always be simply attributed to long-term stable personality defects, moral failure, or pre-established criminal tendencies, but may instead be related to changes in behavioral regulation, impulse control, and social judgment after brain injury [1-3].

Existing studies have discussed the relationship between organic brain lesions and new behavioral abnormalities in different contexts, such as brain tumors, traumatic brain injury, focal brain injury, and frontotemporal lobe-related lesions. Although different cases vary in etiology, lesion site, and specific manifestations, the relevant literature generally indicates that such damage

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DOI: 10.54254/2753-7048/2026.33974

may be associated with abnormalities in behavioral inhibition, emotional processing, social cognition, and consequence assessment. At the same time, studies have also pointed out that new transgressive or criminal acts after injury are not limited to a single type, but may take the form of attacks or impulsive acts, theft, traffic violations, inappropriate sexual behavior, and other forms of socially proscribed conduct [2-4].

This issue deserves further discussion not only because it helps deepen the understanding of the relationship between brain pathology and behavioral change, but also because it has practical significance for judicial judgment, clinical evaluation, risk management and care planning. If such behavior is explained only within a traditional moral or legal framework, the role of organic brain lesions in behavioral change may be overlooked, thereby affecting judgments of responsibility, risk, and intervention. Based on this, this article discusses the relationship between organic brain lesions and new-onset criminal behavior and, drawing on existing research, examines its main manifestations, possible mechanisms, and implications for responsibility assessment and practical response.

2. Core concepts

2.1. Organic brain lesions

Organic brain lesions discussed in this article are not general mental disorders defined only by emotional or behavioral manifestations, but abnormalities with a relatively clear pathological basis in the brain. According to existing studies, this range usually includes brain tumors, focal brain injuries, traumatic brain injuries, frontotemporal dementia and other neurodegenerative diseases. These lesions are of different types, but they may affect brain regions or networks related to behavioral regulation, social judgment, and emotional processing, so it is necessary to define them separately when discussing relevant abnormal behaviors [4, 5].

2.2. New-onset criminal behavior

In this article, "new-onset criminal behavior" mainly emphasizes the occurrence of behavior in time, that is, these criminal acts or serious transgressive behavior do not exist for a long time, but gradually appear after organic brain lesions. Because of this, "new-onset" itself is an important judgment point, which not only suggests that such behaviors may be related to organic brain lesions, but also helps to distinguish them from long-term antisocial tendencies. The new-onset criminal behavior mentioned in this article refers to criminal behavior or serious transgressive behavior in individuals with no obvious relevant history that appears only after organic brain lesions. Relevant studies also point out that in some cases of organic brain lesions, what is really noteworthy is not only whether the behavior itself is illegal, but also the obvious behavioral changes that originally did not exist, but later appeared [1, 2].

3. The common mechanism of organic brain lesions leading to new-onset criminal behavior

The relationship between organic brain lesions and new-onset criminal behavior cannot be simply understood as a certain lesion directly leads to a certain crime. What is more important is how these lesions affect behavior through common neurobehavioral mechanisms. The common mechanism mentioned here does not mean that all lesions will produce exactly the same behavioral results, but rather that different lesions, despite having different origins and locations, may jointly affect the key

DOI: 10.54254/2753-7048/2026.33974

abilities related to behavioral constraints, consequence assessment and social judgment. Existing research shows that although different types of organic brain lesions are different in terms of cause and site, they often affect key abilities such as behavior control, impulse control, social cognition and moral judgment, and the impairment of these abilities is an important basis for understanding new-onset criminal behavior. The significance of this perspective is also that it can explain why organic brain lesions of different sources and parts may eventually show similar forms of behavioral dyscontrol or serious transgression in behavior. This also shows that instead of understanding new-onset criminal behavior from the type of lesions themselves, it is better to pay more attention to which abilities these lesions damage directly related to behavioral constraints [5, 6].

First, the impairment of behavior control and impulse control is directly related to a variety of forms of new-onset criminal behavior. When the frontal lobe and its related networks are damaged, it is more difficult for individuals to suppress immediate impulses, and it is more difficult to fully consider the consequences before taking action. This change is often manifested as aggressive behavior, impulsive theft, traffic violations and other transgressive behaviors that lack sufficient premeditation but have serious consequences. Related traumatic brain injury studies show that aggression, irritability and behavioral dyscontrol after brain injury are not just general emotional reactions, but are more closely related to the structural damage of the frontal lobe and its related regulatory network, which play a key role in inhibitory control and emotional regulation. Such behaviors are often associated with impaired behavioral control and impulse control because they often occur faster, lack full premeditation, and often occur without fully considering the consequences [7, 8].

Secondly, social cognitive abnormalities are also an important mechanism for understanding new-onset criminal behavior. Social cognition includes not only the recognition of other people's emotions and intentions, but also the understanding of social rules, interactive boundaries and behavioral consequences, and these abilities usually depend on the normal function of the prefrontal and temporal networks. Therefore, the abnormality of social cognition is not as simple as not understanding other people's expressions, but may further affect the individual's judgment of other people's situation, interaction boundaries and whether behavior crosses the boundaries. Mendez [5]. pointed out that in behavioral variant frontotemporal dementia, patients often have obvious problems in social perception, emotional understanding and theory of mind. Although such individuals may still retain some knowledge of social rules, their ability to understand the impact of their own behavior on others may have been significantly weakened compared with neurologically intact individuals. There is a clear connection between this and some inappropriate touch, child sexual abuse-related behavior and other serious social transgressions, because these behaviors are often not only doing wrong things, but also reflect that individuals have obvious deviations in understanding the situation of others and social boundaries. In other words, the key problem of this kind of behavior is not only the violation of the rules themselves, but that it may be difficult for individuals to understand the feelings of others, social boundaries and the impact of their behavior on others, so it is easier to cross the boundaries that could have restrained their behavior [5].

Third, the damage to moral judgment is also a key link. Darby et al point out that although the positions of brain injuries associated with criminal behavior are not consistent [6]. They are often connected to the same brain network related to moral decision-making, value judgment and theory of mind. This means that in some cases, the problem is not just a simple impulse dyscontrol, but also may involve a decrease in the ability to feel the pain of others, the consequences of behavior, and the moral significance of actions. In other words, these people may not completely lose the ability to know right and wrong, but they may be significantly weakened in terms of emotional and moral

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reactions, internal constraints and aversion to harm, so that some behaviors that could have been suppressed eventually occur [5, 6].

In comparison, different mechanisms and different types of new-onset criminal behavior do not correspond in a completely one-to-one way. Such behavioral outcomes are closely related to damage to the prefrontal inhibitory control system and related regulatory networks, so they are more likely to manifest as impulsive transgressions, increased aggression, and behavioral dyscontrol. This also suggests that behavioral differences related to different lesion sites may reflect different patterns of damage: damage primarily affecting the inhibitory control system is more likely to manifest as impulsive transgressions, whereas damage primarily affecting social and affective networks is more likely to manifest as interpersonal boundary violations [7, 8]. Different lesions may show different tendencies in behavioral results because of the different focus of damage. In contrast, studies on behavioral variant frontotemporal dementia and acquired pedophilia often point out that social cognitive abnormalities, impaired moral boundaries and disinhibition are more prominent in the emergence of related behaviors, so they are more clearly associated with child sexual abuse-related behavior, inappropriate sexual behaviors, and other serious social transgressions. This also shows that although different organic brain lesions do not strictly correspond to a fixed type of crime, they may still show certain tendency differences in behavior due to the different focus of damage. Therefore, these differences reflect more of the differences in the damaged focus than the behavioral mechanisms that are completely independent of each other; at a deeper level, they may still share some similar neurobehavioral bases [2, 3, 5].

Overall, the link between organic brain lesions and new-onset criminal behavior is not mainly reflected in the fact that a certain lesion corresponds to a certain fixed type of crime, but is more reflected in how different lesions may damage key abilities such as behavior control, impulse control, social cognition and moral judgment. Different types of organic brain lesions may show new-onset criminal behavior with different tendencies through different damage mechanisms, but this relationship is not strictly one-to-one. Despite differences in specific manifestations, these lesions may be connected to a common brain network and affect behavior through similar neurobehavioral mechanisms. This article argues that it is this characteristic of both differences and commonality that allows organic brain lesions to eventually show similar but not exactly the same new-onset criminal behavior [2, 3, 5].

4. Main manifestations of new-onset criminal behavior

Existing studies show that new-onset criminal behavior related to organic brain lesions is not a single form, but can be manifested as child sexual abuse-related behavior, aggressive behavior, theft, traffic violations, and other serious social transgressions. Although the types of lesions and research focuses of different cases are not exactly the same, these behaviors have a common feature: they often emerge after organic brain lesions, rather than being long-term existing behavior patterns [3, 5, 9].

Child sexual abuse-related behavior is one of the most extensively discussed categories in the literature. Relevant studies point out that some individuals have no obvious related history before the onset of organic brain lesions, but show inappropriate sexual acts or criminal acts related to children after the lesions. The reason why this kind of manifestation has received special attention is not only because of its serious social consequences, but also because it clearly reflects the new-onset nature of behavioral changes. Moreover, such behavior also involves complex issues of individual responsibility identification and behavioral control ability judgment [1-3].

DOI: 10.54254/2753-7048/2026.33974

Aggressive behavior is also a common type of manifestation. Especially in studies related to traumatic brain injury, aggression, irritability, behavioral dyscontrol, and impulsive transgressions are repeatedly mentioned. Such behaviors are usually more likely to manifest as sudden emotional outbursts, impulsive attacks without full premeditation, or serious behaviors that underconsider the consequences [7, 8].

Theft and traffic violations are also important manifestations mentioned in the literature. Although they are not usually directly manifested as obvious violence as aggressive behavior, they also suggest that individuals have abnormalities in rule compliance, behavioral adjustment and consequence assessment. Furthermore, the potential impairments reflected by these two types of behaviors may not be exactly the same: in some studies, theft is more related to impulse control and abnormal reward processing, while traffic violations are more likely to reflect the decline of instant judgment, executive function and real-time behavior control ability. Compared with aggressive behavior, such behaviors are not always obviously violent, but they also reflect the individual's problems in compliance with rules, behavioral constraints and consequence assessment. In particular, traffic violations can better reflect the decline of instant judgment and control ability [4, 9].

In addition, although some behaviors may not always be classified into a fixed criminal category, they are still regarded as serious social transgressions in relevant literature, such as inappropriate physical contact, interpersonal boundary violations and inappropriate sexual acts in public, particularly when these behaviors are clearly different from the individual's past behavior patterns and do not occur under recognizable social or situational stimulation, this characterization is more common.

Especially in the studies related to behavioral variant frontotemporal dementia, such performances are often related to social cognitive abnormalities and weakened sense of boundaries. In general, although these main manifestations are different, they all reflect the external results of organic brain lesions at the behavioral level [2, 5].

5. Discussion and suggestion

Existing studies show that new-onset criminal behavior related to organic brain lesions cannot be understood only from traditional moral failures, personality defects or pre-existing criminal tendencies. As discussed above, although different types of organic brain lesions are not exactly the same in terms of aetiology, site and specific manifestations, they often affect key abilities such as behavior control, impulse suppression, social cognition and moral judgment. Therefore, the emergence of such behavior should not be simply understood as a direct manifestation of ordinary criminal intent or simple illegal tendencies, but rather reflects substantial changes in behavioral self-regulation and the ability to predict and assess consequences [5, 6].

From a judicial point of view, one of the most important inspirations of this kind of research is that in the face of new-onset criminal behavior related to organic brain lesions, judgments should not be limited to the results of the behavior itself. For individuals who have no obvious relevant history and have serious transgressive behavior or criminal behavior after organic brain lesions, the traditional behavioral attribution method may not be sufficient. Especially in cases of acquired pedophilia or other behaviors with obvious new-onset characteristics, although the temporal relationship between behavioral changes and brain damage may suggest that organic brain factors may be involved, this in itself is not enough to establish a direct causal relationship. To enhance the persuasiveness of this inference, it is necessary to further prove that the relevant brain damage does involve brain areas related to behavioral inhibition, impulse control or sexual behavior regulation. At

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the same time, neuropsychological evaluation also shows that the individual has deficits in executive function, impulse control or behavioral inhibition consistent with the behavioral change. Therefore, in the process of trial and determination of responsibility, a more reasonable practice is not to simply regard such behavior as an ordinary crime, nor to directly presume that it is completely exempt from responsibility, but to make a more cautious individualized assessment in combination with the type of lesion, behavioral change process, neuropsychological manifestations and specific case [1, 3, 10].

At the same time, such studies also suggest that the issue of liability may be more complicated in such cases than in general cases. As mentioned above, organic brain lesions may damage an individual's ability to control behavior, understand social rules and boundaries, and the ability to feel the pain of others and the consequences of behavior. This means that although some individuals may not completely lose the ability to know right and wrong, this judgment may not be enough to form effective behavioral constraints. Consequently, in judicial judgment, if the individual's subjective responsibility is understood only according to the apparent severity of the behavior, without considering the actual impact of organic brain lesions on behavioral regulation and volitional control, it may not accurately reflect the individual's true degree of agency or responsibility [5, 6].

In addition to judicial judgment, such individuals also need special attention in the care, detention or other management processes. Since the relevant behavior may be related to the decline in impulse control, the weakening of the sense of boundaries and the abnormality of social cognition, it is often not enough to rely on routine disciplinary measures alone. For individuals who have shown obvious aggressive tendencies, boundary-crossing behavior or inappropriate sexual behavior, family members and daily caregivers should strengthen behavioral observation in daily settings and minimize situations that may induce risks. At the same time, medical personnel and relevant management institutions should carry out more systematic risk assessments and formulate more targeted support and management measures in combination with neuropsychological evaluation and clinical judgment. Especially when behavioral changes are sudden and obviously inconsistent with previous personality characteristics, it is better to consider whether there are organic brain lesions in time, and take more targeted support and management measures in combination with neuropsychological assessment and clinical judgment [4, 5].

Therefore, the significance of existing research lies not only in re-understand the relationship between organic brain lesions and new-onset criminal behavior, but also to remind the judicial system, medical personnel and care workers to take a more cautious and comprehensive approach to such cases. This article argues that the discussion of such behavior should not be limited to the level of whether it is a crime, but should further pay attention to whether the lesions have substantially affected the individual's behavior ability, social understanding ability and risk control ability. Only on this basis can the relevant trial, care and management measures be more reasonable [3, 5, 6].

6. Conclusion

In conclusion, there is indeed an important link between organic brain lesions and new-onset criminal behavior that deserves attention. Based on neuroimaging studies, neuropsychological assessments, and clinical case documentation, the discussion in this article shows that such behaviors cannot be simply attributed to traditional moral misconduct, personality pathology, or long-term stable criminal tendencies, but more precisely, should be understood as a manifestation of acquired impairments in behavioral regulation, impulse control, social cognition, and judgment ability after brain injury. It is also clear that new-onset criminal behavior related to organic brain lesions is not limited to a single type, but may take the form of aggression, theft, traffic violations,

DOI: 10.54254/2753-7048/2026.33974

inappropriate sexual behavior, and other serious transgressive acts. Different manifestations may correspond to different degrees and aspects of neurological impairment.

On this basis, this article argues that the understanding of such behavior should not be limited to the single question of whether the act is illegal, but should also take into account the temporal sequence of behavioral change, the characteristics of the lesion, changes in neuropsychological function, and the individual's previous behavioral pattern. Whether in judicial judgment, clinical evaluation, or daily management, overly simplified attribution should be avoided. For such individuals, it is both clinically and ethically preferable to adopt more cautious and targeted evaluation and intervention measures in light of lesion type, behavioral presentation, risk level, and neuropsychological indicators.

Therefore, the significance of this article lies not only in re-examining the relationship between organic brain lesions and abnormal behavior, but also in reminding the society that a more comprehensive framework is needed across medicine, justice, and care management when responding to such cases. Promoting this integrated framework will enable more accurate analysis of the causes of behavioral changes after brain injury and provide a more well-founded basis for criminal responsibility assessment, risk stratification, and practical support measures.

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