

The Causal Link between Functional Disorder of the Orbitofrontal Cortex, Disorder of Moral Reasoning and Aggressive Sexual Behavior

Gabriel TĂNĂSESCU

*University of Craiova, Craiova, Romania
gabrieltanasescu@gmail.com*

ABSTRACT: This article describes the causal link between aggressive sexual behavior, including pedophile behavior, moral reasoning disorder and orbitofrontal cortex dysfunction (sometimes a tumor located in this area). The criminological analysis is also justified by the studies published by Charles Choi (2002) in *New Scientist* where the case of a 40-year-old man whose brain tumor suffered from sudden pedophilia and an uncontrollable obsession for sex, as well as the studies published by Giuseppe Sartori (2016) and collaborators explaining the functional disorder of the orbitofrontal cortex, a brain region responsible for behavioral inhibitions, emotional comprehension, and moral responsibility. From the legal point of view, the criminal responsibility is analyzed in the situation where the discernment is affected by the physiological determinism. In this sense, brain imaging plays an important role.

KEYWORDS: aggressive sexual behavior, brain imaging, orbitofrontal cortex dysfunction, criminal responsibility, pedophilia

Introduction

Pedophilia is characterized by sexual activity with a prepubertal child less than 13 years of age, the age difference between pedophile and its victim should be greater than 5 years and the pedophile should be 16 years of age or older (DSM-IV-TR, 2003). The Romanian penal code criminalizes in art. 220 sexual intercourse with a minor. Sexual intercourse, oral or anal intercourse and any other vaginal or anal penalty committed with a minor between the ages of 13 and 15 shall be punished by imprisonment from one to five years (Article 220 (1) of the Penal Code). The same act, provided in par. (1) committed against a minor who has not reached the age of 13 shall be punished by imprisonment from 2 to 7 years and the prohibition of the exercise of certain rights. The Criminal Code does not make any reference to the age difference between the victim and the aggressor, nor does it specify issues related to the sexual maturity of the perpetrator. The minor who has not reached the age of 14 is not criminally liable (Article 113 paragraph (1) of the Criminal Code). The perpetrator aged between 14 and 16 years is criminally liable if it proves to have been discerned (Article 113 (2)). After the age of 16 the minor will be held liable according to the law.

Dysfunction of the orbitofrontal cortex

In his book on the rules of the brain, John Medina presents the case of a Phineas Gage man who suffered an accident when working on the construction of the railways (1848). After an explosion, the prefrontal cortex was damaged (a 90-cm rod penetrated just below the eye), but the man survived (Medina, 2017). After the accident, the male's social behavior has changed. He abandoned his family sometimes aggressive and irresponsible, living all his life through different cities, under the impetus of his

primitive instincts. Deterioration of the prefrontal cortex caused inhibition of emotional impulses and causing abnormal social behavior.

In a recent article (January 2019, *The Anatomical Record*), Jose Luis Trejo emphasizes the importance of cranial nerves in coordinating the individual's social activity. "Cranial nerves carry the information from the sensory organs to the brain, and the instructions for the muscles of all these organs in the face, neck, heart, and abdomen" (Trejo, 2019). Our presence in society is also described by how we manifest, how we act in certain situations, as we display; gestures and body movements are important in the relational process. Cranial nerves helps us control smile, eyesight, balance of senses, facial expressiveness, body posture. Deterioration of the orbitofrontal cortex can affect behavioral actions, the individual becomes incapable of learning from his own mistakes, and at the same time he does not realize the severity of the committed deeds. The healthy physical and mental social man has the ability to correct the mistakes made and to limit the damages caused by his actions (Tănăsescu, 2012a).

Neuroimaging studies find that areas of the orbitofrontal cortex are activated by pleasant touch, painful touches (violent acts), by taste, by smell, by affecting feelings and abstract states such as winning or losing money (Rolls, 2004). The orbitofrontal cortex is responsible for controlling motivational, emotional, social behavior, and is also involved in decoding and representing primary reinforcement elements such as taste and touch, correction of reward and punishment behavior (Rolls, 2004). "To primates stimuli for sensory systems that influence emotional and motivational behavior through the neural relays to the orbitofrontal cortex" (Rolls, 2004). Antoine Bechara believes that the influence of emotions on the decision-making process is largely ignored. The intellectual factor (discernment, judgment, reflection) is complemented by the affective, emotional factor in decision-making. The amygdala, the somatosensory / insular cortex and the peripheral nervous system are structures which, along with the orbitofrontal cortex, help and mediate the will to make decisions (Bechara, Damasio and Damasio, 2000). Ventromedial lesions (including the orbitofrontal sector) of the prefrontal cortex interfere with the normal processing of emotional somatic signals (Bechara, 2004). Any injury to the orbitofrontal cortex, as well as other damage that affects the sensory system stimuli, is a functional disorder of moral reasoning.

Moral judgment, when judging and assessing the moral value of the individual's behavior, is based on both the moral intuition (which uses both the pulses of the unconscious and the wishes of the conscious Ego) as well as certain cognitive and affective mechanisms. The role of moral reasoning is to anticipate the consequences of immoral actions, to prevent and prevent the triggering factor. The quality of decisions in the individual's social life depends on intellectual, affective and emotional health. Orbitofrontal cortex lesions may compromise judgment, some cognitive and moral processes being affected criminal responsibility must be determined according to the complexity of the discernment. Professor Kent Kiehl considered cerebral imaging as important as DNA samples. "Neuroscience and brain imaging will transform the whole philosophy of punishment, these things will change the way we decide who and how we punish."

In March 2003 Jeffrey M. Burns and Russell H. Swerdlow published in *Jama Neurology* a "Right orbitofrontal tumor with a pedophilia symptom and constructional apraxia sign" describing the case of a 40-year-old man who is due to an egg-sized tumor has suddenly changed his social behavior, being unable to control his deviant sexual pulse with pedophile preferences. Cancer was located in the right lobe of the orbitofrontal cortex, which is known to play an important role in decision-making, impulse control and social behavior (Burns, Swerdlow, 2003). This area deals with moral reasoning, "here we are talking about neurology of morality"; the area does not affect physical health, sometimes doctors do not realize the gravity of the situation

(Burns and Swerdlow, 2003). The patient's life before being affected by the orbitofrontal cortex was normal. The man was married, never committed crimes and respected social rules being a school teacher. After the onset of the brain tumor, the patient began to be obsessed with child pornography, began to solicit prostitutes in massage rooms, and make sexual advances to young children; the situation worsened and began to make subtle sexual advances to her prepubescent daughter (Burns, Swerdlow, 2003). He was found guilty of molesting children and was forced to carry out a rehabilitation program. In the program, she continued to show her deviant sexual behavior; sexual impulse affected her moral balance and social activities (sexual arousal could not be controlled, she suggested to women in the program to have sex with him). Before a prison sentence a medical assessment (due to severe headache), an MRI scan showed that the patient had a brain tumor in the egg-sized orbitofrontal cortex that affected her sexual instinct's behavior and control. "Orbitofrontal cortical abnormalities are associated with low impulse control, deviant sexual behavior and antisocial personality" (Burns, Swerdlow, 2003). After the tumor resection the patient recovered, the moral and social function was restored; this allowed her to return home and have a normal and professional social life.

In 2016 and 2018, Sartori et al. present similar studies in which he finds that dysfunction of the orbitofrontal cortex is responsible for inhibiting behaviors, understanding emotions and other abilities related to moral reasoning (Sartori, Scarpazza, Codognotto, Pietrini, July 2016, in the *Journal of Neurology*). In their article "An unusual case of acquired pedophilic behavior following compression of the orbitofrontal cortex and hypothalamus by a Clivus Chordoma" is reported the case of a man (a 64-year-old pediatrician married over 40 years) with frontal and temporal lobe injuries, the symptom of a Clivus Chordoma, a rare, slow-growing neoplasm originating from the bone at the base of the skull that compressed the hypothalamus and the orbitofrontal cortex. The man was caught while molesting a little girl in a nursing home. At the time of arrest, the pedophile appears to be absent, lacking moral and social function, and is unaware of the seriousness of his behavior and the legal consequences of the illicit deed (Sartori, Scarpazza, Codognotto and Pietrini, 2016).

In *Frontiers in Neuroscience* Scarpazza, Pennati, Sartori is presented the analysis of the case of a man over 70 years old (he was married for 40 years, had three children, a former trader) who was arrested for inappropriate sexual behavior. The old pedophile had sexual preference male boys and adolescents. Prior to retirement, during his professional activity, the family characterized him positively as a responsible father engaged in social projects, moral reasoning not being affected. Over time, health has worsened, retirement has triggered a major depression for the man. After the arrest, psycho-legal forensic expertise confirmed the existence of fronto-temporal dementia, the defendant having a cognitively impaired profile (he did not understand the value of money, bought expired food, became verbally aggressive and hypersexual to his wife, impulsive behavior with kleptomania, impulse inhibition). Neurological examination and cerebral imaging (MRI) revealed atrophy of the bilateral frontal lobe (Scarpazza, Pennati and Sartori, 2018). In another case like a 60-year-old man (married over 30, had two children) was arrested and brought to court for inappropriate sexual behavior. The man had a pedophile behavior and was molesting the children in public space. "Medical data suggest that the defendant's sexual deviance, which began about a year before his arrest, coincided with the achievement of a critical mass of tumor volume in his brain. The meningioma was large enough to compress the front lobes and produce a significant mass effect with the inter-hemispherical change of median structures" (Scarpazza, Pennati, Sartori, 2018).

David Eagleman in his book “Brain Our Story” portrays the case of a 23-year-old man (Ken Parks, married, having a five-month-old daughter) experiencing financial and marital problems, but also gambling addiction. Although well understood with his wife's parents, one night (May 23, 1987) he wakes up, runs 23 km by car to their house and kills them (by kneading the man by stabbing the woman). After the murder, he surrendered to the authorities saying he had just killed someone (Eagleman, 2018). In detention Roger Broughton (professor emeritus of neurology and neuroscience) measured the killer's EEG signals while sleeping at night; the resulting result led to the conclusion that the 23-year-old man was affected by sleepwalking (Eagleman, 2018). The investigations found that several members of his family had trouble sleeping. A year later, the man was acquitted. Brain activity, judgment, cognitive and moral reasoning can be affected by sleepwalking, a sleeping behavior disorder. Recent studies show that 25% of sleepwalks dreams of escaping a disaster, but 75% of subjects with sleep-disorder (RBD) counterattacked when attacked (Uguccioni, Gollmard, de Fontreaux, Semenescu, Brion and Arnulf, 2013).

Psychological aspects

Individuals with paraphilia seek to satisfy their sexual fantasies, the aggression drive and sexual impulses involve suffering or humiliation of the victim, non-human objects or children or other persons who do not consent. “Paraphilic stimuli are mandatory for erotic excitement and are always included in sexual activity” (DSM-IV-TR 2003). In the case of pedophilia, the will of the social ego is affected, the inner moral court (Superego) fails to censor the sexual instinct. Fantasies and sexual pulsations impair social behavior, causing interpersonal problems about emotional freedom and individual actions. Sometimes unaccustomed sexual intercourse with a child can turn into sexual sadism, the perpetrator obtains sexual satisfaction by experiencing and becoming aware of the suffering caused to the victim; holding control, humiliating and forcing the minor offers pleasure to the tensions and needs of the Id. Sexual sadism may occur at the beginning of the adult period, sadistic acts may involve rape, beating, whipping, serious bodily injury; when sexual sadism is severe, especially when associated with antisocial personality, the aggressor can seriously injure or kill victims (DSM-IV-TR 2003).

When the victim is frightened, with fear and pain, his face that transmits an obvious pain, his general anxiety, and panic gestures, he excites the aggressor sexually and stimulates his the aggression drive. For sexual fantasies, the perpetrator can appeal to a sexually consensual partner (sex masochism, adult victim accept sadism, body injuries), or force the vulnerable victim to endure sadistic sex acts, for which he will be penalized the severity of the situation. “Sexual offenses against children constitute a significant proportion of all reported sexual offenses, and individuals with exhibitionism, pedophilia and voyeurism constitute the majority of sex offenders arrested” (DSM-IV-TR,2003). Usually uncontrollable sexual behavior adversely affects the life of the individual, causing distress and difficulties in managing relationships with a life partner (if any), social isolation interrupts ties with family and friends in his or her professional world. There are situations when individuals with pedophile behavior feel guilty after committing the illicit act and experience distress, state of restlessness and confusion (Tănăsescu 2012b). But many pedophiles do not experience significant distress and continue to have sexual fantasies with children, pursue pedophile pornography, and seek opportunities to get satisfaction through deviant sexual behavior. Some individuals prefer boys between the ages of 11 and 13, and others prefer older girls from 08 to 10 years old (DSM-IV-TR 2003). The rate of relapse is two times higher for pedophiles who prefer boys. There are pedophiles who have erotic fantasies and are sexually attracted to children, cannot otherwise touch the state of sexual arousal;

there are pedophiles who also prefer to have sex with adults, sexual preferences are not limited to pedophile behavior. Individuals with pedophilia can aggress the children of their own family or expand their sexual activity and seek out casualties from the community. In order not to be caught by the authorities they threaten their victims and try to hide their deviant behavior through various techniques. In some cases the pedophile marries a woman who has an attractive child or tries to gain the mother's trust; the pedophile may participate in the commercialization of children with other pedophile individuals, or may kidnap children from foreigners (DSM-IV-TR 2003).

Psychoanalytic aspects

In the Compendium of Psychoanalysis, Freud considers that the Id is listening to the authoritarian principle of pleasure; separated from the outside world has its own perceptual world (Freud 2014). Primary processes and organic drives, including sexual drive and the destruction drive, originate in the darkness of the unconscious in the dark Id, which through another instance (the Ego) succeeds in satisfying their needs and keeping in touch with the reality of the outer world. Superego, the moral court, is the one who censors unscrupulous satisfaction of organic drives. His active presence sometimes exhausts the Ego (the complex of inferiority, low self-esteem appears) and pushes him to avoid unpleasant experiences. "It is certain that self-perceptions - general affections and pleasures - pleasure dominate the processes of Id with a despotic force" (Freud 2014). The principle of pleasure cannot be suppressed; it can only be modified or tempered; in essence, he calls for diminishing or extinguishing the tensions of organic needs. The ego has developed from the "cerebral cortex of the Id" (Freud 2014) and lies through perceptions in direct contact with reality. Conscious of the importance of self-preservation, the Ego checks the requirements for the satisfaction of the drives and decides to execute or repress them, depending on the danger this satisfaction creates. In the case of direct dissatisfaction with the drive requirements, the Id must find another alternative substitution. The original pulse goal can be weakened and desexualized, substitution satisfying depends on the way the Ego participates in the cultural world and manifests itself in the outside world. If the Ego fails to overcome sexual arousal, the lag behind the development of the Ego in the development of libido creates the essential condition of neurosis (Freud 2014).

In the case of rapist pedophile, we can sometimes speak of the existence of an ego cleavage. In the anamnesis, the perpetrator knows that in reality the victim is injured, sexual intercourse is carried out by force, the cruelty of the report is obvious, the pedophile knows the reality of the situation and accepts the child's state of affliction; but the other psychic attitude, under the influence of the sexual drive, breaks down the Ego of Reality (Freud 2014) and considers that the victim has consented to violent sexual intercourse, that the victim caused it and wanted sexual intercourse, that he felt at the touch of the victim the attachment, and affection. The two attitudes can coexist in the life of the individual without influencing each other, two mental attitudes in place of one, the one that pertains to reality. By this means, the Ego defends itself from the exigency of the outside world, felt like a aggressive world (Freud 2014).

Conclusions

Freud believes that a stronger addition to the sexual aggression factor makes the boyfriend a violent assassin, and a sharp decline in the aggressive factor makes a loved one a shy or impotent individual (Freud 2014). Justice needs to check the health of the people they condemn. Justice has an important role to play in establishing the truth in the criminal process, to find legal ways for victims of violent crimes to be fully compensated for the material and moral damage caused by the perpetrator, to determine

the punishment and the manner in which sanctions are enforced by the victim sentenced; to prevent crime, justice also has the role of applying carceral treatment best suited to those in detention. The healing of the illness of prisoners affected by certain brain malfunctions, if scientifically and physically feasible, would become a moral and necessary act to prevent relapse (Dr. Daniel Amen, psychiatrist, supports an intensive brain rehabilitation program). The research must be justified and positive, both for the benefit of the condemned and useful to the social system, because after the medical treatment the patient will be able to reintegrate more easily into the community, having a normal and balanced emotional life without deviant sexual behavior. Recurrence is no longer possible unless the cerebral affection (tumor) is also recurrent. Restoring the brain affected by the disease contributes to the restoration of the behavior.

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