

Orbitofrontal syndrome in an offender incarcerated for aggravated kidnapping, rape and death of a minor

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ABSTRACT

Orbitofrontal syndrome is characterized by disinhibition, impulsiveness, transgression of social norms and sometimes the development of criminal behavior. This is the case of an 18-year-old male offender incarcerated for kidnapping, rape and homicide of a minor. He was evaluated through interviews and the use of the Eysenck personality questionnaire (Form B), Raven's progressive matrices (RPM), Rey-Osterrieth complex figure (Form A), Differences perception test (FACES-R), Stroop color and word test (SCWT), Mini-Mental state examination (MMSE), and Anger, irritability and aggression (CIA) questionnaire. The research subject showed age-appropriate speech, language and vocabulary, and had neither physical problems nor attention, language, writing, reading, praxis, calculation, perception and memory disorders. The results highlight a higher-than-average intelligence quotient, optimal cognitive skills, melancholic temperament with depressive thoughts, introverted personality with low environmental sensitivity, poor social skills, self-absorption and avoidance. Additionally, perfectionist tendencies, sudden emotional changes, difficulty changing behavioral patterns, impulsiveness and disinhibition, all of which are characteristics of orbitofrontal syndrome. Finally, the research highlights the use of psychometric tests and neuropsychological evaluations for the diagnosis of orbitofrontal syndrome. Said tests and evaluations are necessary for the proper management of offenders incarcerated in prisons and/or detention centers who do not have access to neuroimaging; moreover, they may be used to design strategic intervention programs.

Keywords: Frontal Lobe; Neuropsychology; Rehabilitation Centers (Source: MeSH NLM).

Síndrome orbitofrontal en un interno con infracciones por secuestro agravado, violación sexual y muerte de una menor de edad

RESUMEN

El síndrome orbitofrontal se caracteriza por la ausencia de inhibición, escaso control de impulsos, transgresión de normas sociales y, en determinados casos, la materialización de conductas delictivas. Se presenta el caso de un interno varón de 18 años con infracciones por secuestro, violación sexual y homicidio de una menor de edad, a quien se evaluó a través de entrevistas y uso del test de Eysenck (Forma B), test de matrices progresivas de Raven, test de la figura compleja de Rey (Forma A), test de percepción de diferencias (Caras-R), test de Stroop (colores y palabras), test Mini-Mental y Cuestionario de cólera, irritabilidad y agresión (CIA). El evaluado muestra un lenguaje y vocabulario de acuerdo con su edad, no presenta problemas orgánicos, ni alteraciones en atención, lenguaje, escritura, lectura, praxias, cálculo, percepción y memoria. Los resultados destacan un coeficiente intelectual superior al término medio con óptimas capacidades cognitivas, temperamento melancólico con pensamientos depresivos, personalidad introvertida con baja sensibilidad a los cambios en el ambiente, escasa sociabilidad, ensimismamiento y evasión. Asimismo, evidencia tendencias perfeccionistas, con cambios emocionales bruscos y dificultad para reorientar patrones conductuales, alta tendencia a la impulsividad y escaso control inhibitorio; elementos característicos de un síndrome orbitofrontal. Finalmente, se destaca el uso de pruebas psicométricas y evaluaciones neuropsicológicas para el diagnóstico del síndrome orbitofrontal, necesarias a incorporar para el adecuado manejo de internos en los centros penitenciarios y/o de rehabilitación que no tienen acceso a estudios de neuroimagen y a partir de los cuales pueden diseñarse programas de intervención estratégicos.

Palabras clave: Lóbulo Frontal; Neuropsicología; Centros de Rehabilitación (Fuente: DeCS BIREME).

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INTRODUCTION

Frontal lobes are structures located at the front-most part of the cerebral cortex, in front of the central fissure and over the Sylvian fissure. Anatomically speaking, they account for a third part of the human brain and are divided into three areas: orbitofrontal, medial frontal and dorsolateral (Figure 1).

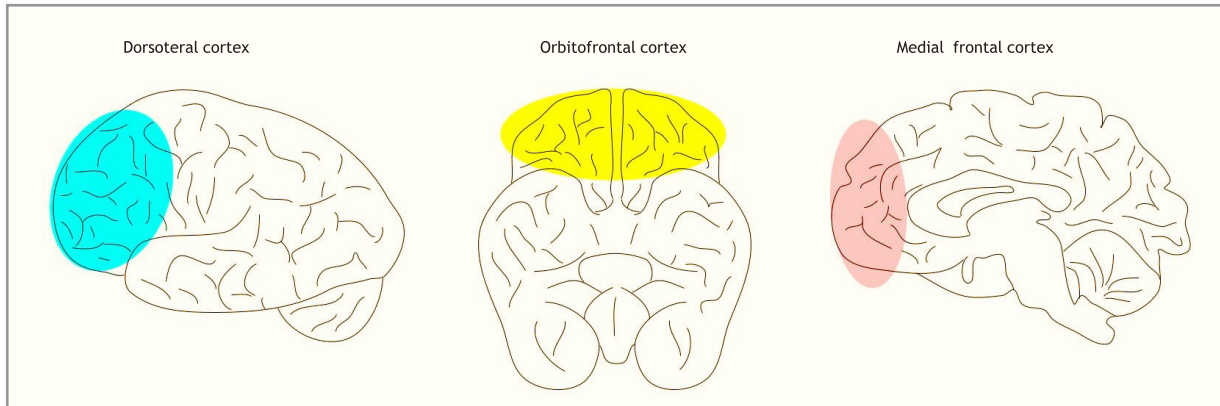


Figure 1. Frontal lobe

It is the most developed area in the phylogenetic scale and is the center of the human person, responsible for managing the identity of an individual. Thanks to this area, thoughts are transformed into decisions, plans and actions (dorsolateral area), emotions are regulated (medial frontal area) and, particularly, our darkest impulses are inhibited (orbitofrontal area).

Orbitofrontal syndrome is known for disinhibition, impulsiveness and transgression of social norms. Therefore, it is associated with the development of criminal behavior. It occurs particularly in adolescence, a phase when the brain has not yet been fully developed and is characterized by poor adaptive coping skills ⁽¹⁾.

CLINICAL CASE

Male aged 18 years (16 at the time of the transgression), voluntarily participating in the study, born in Lima, right-handed with complete secondary studies, facing a socio-educational penalty at Centro Juvenil de Diagnóstico y Rehabilitación de Lima (CJDR Lima - Juvenile Diagnostic and Detention Center Lima) for aggravated kidnapping, rape and death of a minor.

Concerning the transgression, the young man told that while drunk on his way home from a party in his neighborhood, he ran into three minors. He approached them and invited them to buy something in a store, and when the girls were distracted, he carried one of them (4 years old) and took her with him to his brother's house. There he abused her, fell asleep, and when he woke up, he realized that she was unconscious, took a tool and hit her in the head, and so he allegedly killed her.

Subsequently, he put the corpse into a sack, left it in a vacant land and fled. However, the municipality cameras in the neighborhood were examined, the images were broadcasted on television, and he was captured some hours later.

The research subject did not have any records of previous legal transgressions or a significant medical or psychological history. He had completed elementary school but not high school. He had worked as a loader in a market since he was 10 years old and mentioned that he did not have many friends. He said that he did not use drugs but occasionally consumed alcohol since he was 13 years old. Concerning his sexual activity, he started at 13 (heterosexual).

He came from a single-parent household with an unloving mother and strict parenting style: when he did not obey the family rules, he was physically punished (with a belt). Moreover, he never met his father. In the last few years, he moved into his stepbrother's place because it was the closest to his job (loader).

After the research subject voluntarily signed the informed consent, anamnesis, behavioral observation and clinical interview were carried out; he declared his infringing behavior; and data was collected using the following instruments: Eysenck personality questionnaire, which assesses personality (validity and reliability of 0.68 measured with correlation coefficient and test-retest method, respectively) ⁽²⁾; Raven's progressive matrices (RPM), aimed to examine intellectual ability (reliability of 0.89 and validity of 0.86 measured with split-halves method) ⁽³⁾; Rey-Osterrieth complex figure, which evaluates perceptual organization and visual memory (reliability

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of 0.83 and validity of 0.78) ⁽⁴⁾; Differences perception test (FACES-R), which determines attention skills and impulsiveness control (validity of 0.81 and reliability of 0.88 measured with Cronbach's alpha coefficient) ⁽⁵⁾; Stroop color and word test (SCWT), which assesses self-regulation and executive function disorders (validity and reliability of 0.78 measured by analyzing the main components and intraclass correlation coefficient, respectively) ⁽⁶⁾; Mini-Mental state examination (MMSE), which diagnoses dementia (validity of 0.80 and reliability of 0.89) ⁽⁷⁾; and Anger, irritability and aggression (CIA) questionnaire, an instrument that assesses susceptibility to anger, irritability and aggression (content validity and reliability of 0.94 measured by expert opinion and Cronbach's alpha coefficient, respectively) ⁽⁸⁾.

Hence, the results showed age-appropriate speech, language and vocabulary. He did not present apparent

organic disorders and/or physical problems. He had error awareness, took responsibility on his actions and expressed remorse. He had a higher-than-average intelligence quotient and showed argumentation skills with an adequate level of understanding and analysis. Moreover, he showed melancholic temperament with depressive thoughts, introverted personality with low environmental sensitivity, poor social skills, self-absorption and avoidance. Additionally, he showed perfectionist tendencies, sudden emotional changes, difficulty changing behavioral patterns and impulsiveness. At neuropsychological level, he was oriented to person, time and space. He did not show attention, language (but, at prosodic level, he had poor intonation and expression when speaking), writing, reading, praxis, calculation, perception or memory disorders (Table 1).

Table 1. Test results

Instrument	Score	Interpretation
Eysenck personality questionnaire	Introverted-extraverted = 10 Stable-unstable = 16	Introverted-melancholic Intellectual superiority
Raven's progressive matrices	DS = 58 / percentile > 95	Memory superiority
Rey-Osterrieth complex figure	DS = 32 / percentile > 75	Low-medium performance
FACES-R test	DS = 36 / percentile 20 / enneatype 3 ICI = 86 / percentile 10 / enneatype 2	Impulsiveness
Stroop color and word test	Words [W]: DS = 136 / TS = 64 Color [C]: DS = 101 / TS = 64 Word-color [WC]: DS = 57 / TS = 62 Interference [I]: DS = -1 / TS = 49	Superiority in reading: [W], [C] and [WC]. Inferiority in [I] (difficulty with cognitive flexibility)
Mini-Mental state examination	DS = 30	Normal (dementia screening)
CIA questionnaire	Irritability: DS = 44 Anger: DS = 30 Aggression: DS = 91	Impulsiveness

DS: direct score; TS: typical score; ICI: impulse control index

DISCUSSION

The neuropsychological evaluations (Table 1) showed that the research subject suffered from orbitofrontal syndrome due to the high rate of impulsiveness, disinhibition and difficulty changing behavioral patterns: elements that are associated with an antisocial behavior ⁽⁹⁾.

Regarding the family dynamics, he said that he was the fourth of five siblings (from three different relationships) and had never lived with his father. In this regard, Morales et al. ⁽⁹⁾ state that, in a father-son relationship, father rejection and absence lead to disruptive behaviors aimed to punish parents as a response to their flat affect.

He was not a victim of sexual abuse as a child, so a history of preexisting rape and repetition of a behavioral pattern cannot be considered. He also stated not using psychoactive substances, except for alcohol (occasionally). He mentioned being drunk when he committed the offense; however, it is difficult to determine whether alcohol is the only trigger of violent reactions ^(10,11).

In this case, there was no evidence of marked psychological disorders, so it is not always possible to establish specific psychopathological characteristics among prison populations ⁽¹²⁾.

As to the neuropsychological profile, there is evidence of impulsiveness, possibly related to a poor frontal lobe function, which may become crucial in the rehabilitation process of incarcerated offenders ⁽¹³⁾.

It is important to consider that besides being a predictive factor of sociopathic behavior, age includes two groups: “indulgent” and “lacking.” ⁽¹⁾ This case corresponds to the latter because the research subject was raised with lack of affection and economic deprivation. It should be noted that during adolescence the brain has not yet been fully developed and is characterized by poor adaptive coping skills ⁽¹⁾. Regardless of his high intellectual level, the research subject showed impulsiveness and limited cognitive flexibility.

Sophisticated assessment devices were not used since bringing these materials to prisons and the time allowed with the research subject were restricted for security reasons; therefore, simple and quick tests were administered. Furthermore, it should be mentioned that, although an orbitofrontal syndrome may explain, to some extent, the offences committed by the research subject, it is not intended to justify or diminish the defendant’s responsibilities.

Finally, this research highlights the use of psychometric tests and neuropsychological evaluations for the diagnosis and assessment of orbitofrontal syndrome ^(14,15) since they are necessary for the proper management of offenders incarcerated in prisons and/or detention centers who do not have access to neuroimaging.

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BIBLIOGRAPHIC REFERENCES

- Rodríguez Iñesta D, Pereira Docampo JR, Botella Tortosa P, Rodríguez Botella L, Mirete Molina E, de las Heras Junco S. Estudio de caso de un adolescente condenado por parricidio. *Revista de Psicología Clínica con Niños y Adolescentes* [Internet]. 2015;2(1):63-8. Available from: <https://www.revistapcna.com/sites/default/files/14-12.pdf>
- García Sevilla L, Pérez J, Tobeña A. Fiabilidad y validez de la versión castellana del E.P.I. (Eysenck Personality Inventory). *Revista Latinoamericana de Psicología* [Internet]. 1979;11(3):393-402. Available from: <https://www.redalyc.org/pdf/805/80511307.pdf>
- Raven J, Court J. *Raven Manual. General Overview*. Oxford Psychologists Press. 1998.
- Custodio Capuñay NS. Rendimiento del test de alteración de memoria para detectar deterioro cognitivo leve y enfermedad de Alzheimer en estadios iniciales en población de bajo nivel de instrucción de dos distritos de Lima [graduate thesis]. Perú: Universidad de San Martín de Porres; 2016. Retrieved from: <https://repositorio.usmp.edu.pe/handle/20.500.12727/3734>
- Ruiz Castro J. Predictibilidad de dos procesos cognitivos y una función ejecutiva sobre los procesos de escritura en una muestra de estudiantes de la ciudad de Cusco [graduate thesis]. Perú: Universidad de San Martín de Porres; 2019. Retrieved from: <https://hdl.handle.net/20.500.12727/5315>
- Rodríguez Barreto LC, Pineda Roa CA, Pulido NDC. Propiedades psicométricas del Stroop, test de colores y palabras en población colombiana no patológica. *Univ Psychol* [Internet]. 2016;15(2):255-72. Available from: <http://dx.doi.org/10.11144/javeriana.upsy15-2.ppst>
- Romero Aguilar IE. Disfunción cognitiva en el adulto mayor que acude al centro de salud Tayta Wasi 2019 [undergraduate thesis]. Perú: Universidad Norbert Wiener; 2019. Retrieved from: <https://renati.sunedu.gob.pe/handle/sunedu/3149657>
- Estrada Suárez WH. Niveles de conducta de riesgo en alumnos de 6° primaria de una institución educativa parroquial de Iquitos [undergraduate thesis]. Perú: Universidad Científica del Perú; 2017. Retrieved from: <http://repositorio.ucp.edu.pe/bitstream/handle/UCP/323/ESTRADA-1-Trabajo-Niveles.pdf?sequence=1&isAllowed=y>
- Morales Ortega HC, Villanueva Sarmiento I. Estudio sobre el menor homicida en la ciudad de Barranquilla. *Revista Justicia* [Internet]. 2005;10:36-60. Available from: <https://revistas.unisimon.edu.co/index.php/justicia/article/download/884/872>
- Pastor F, Reig Ruano M, Fontoba Ferrándiz J, García del Castillo-López A. Alcohol y violencia. *Salud y drogas* [Internet]. 2011;11(1):71-94. Available from: <https://www.redalyc.org/pdf/839/83918877005.pdf>
- Yesuron MR. Perfil psicopatológico de delincuentes sexuales. *Anuario de Investigaciones de la Facultad de Psicología* [Internet]. 2015;2(1):192-203. Available from: <https://revistas.unc.edu.ar/index.php/aifp/article/viewFile/13178/13375>
- Moreno MI. Estudio comparativo del perfil neuropsicológico prefrontal entre sujetos con conductas psicopáticas y/o delictivas y sujetos normales, en el contexto del peritaje forense. *Rev Fac Cien Med* [Internet]. 2014;39(1):42-52. Available from: https://revistadigital.uce.edu.ec/index.php/CIENCIAS_MEDICAS/article/view/1129/1129
- Delgado-Mejía ID, Etchepareborda MC. Trastornos de las funciones ejecutivas. Diagnóstico y tratamiento. *Rev Neurol* [Internet]. 2013;57(1):95-103. Available from: <https://www.pearsonclinical.es/Portals/0/DocProductos/NEPSY-funciones-ejecutivas.pdf>
- Soriano Pérez AM, Meza Dávalos EG, Valencia Granados FJ, Zarate Méndez A. Personalidad antisocial o síndrome orbitofrontal. A propósito de dos casos clínicos. *Neurol Neurocir Psiquiat* [Internet]. 2003;36(3):131-7. Available from: <https://www.medigraphic.com/pdfs/revneuneupsi/nnp-2003/nnp033d.pdf>
- Garrido-Sánchez E. Rehabilitación neuropsicológica en el síndrome disejecutivo orbitofrontal: estudio clínico de caso único [graduate thesis]. España: Universidad de Jaume I; 2020. Retrieved from: https://repositori.uji.es/xmlui/bitstream/handle/10234/195354/TFM_2021_Garrido%20S%C3%A1nchez_Estabiliz.pdf?sequence=1

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