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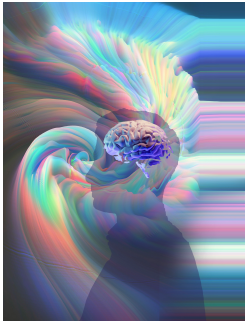
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 OPEN ACCESS***Corresponding author:**

Mauricio Cuartas-Arias

Email: jmcuartasa@eafit.edu.co

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Exploring Dual Pathology: Opportunities and Challenges

Explorando la patología dual: Oportunidades y retos

Mauricio Cuartas-Arias^{1,*} 

¹ *Department of Psychology, School of Arts and Humanities, Universidad EAFIT. Medellín, Colombia.*

Dual pathology (DP) presupposes an interdependence between mental illnesses and addictive disorders. In this regard, one of the most relevant studies for DP was carried out through epidemiological surveys by the World Health Organization, in which they reported that 36.9% of individuals who had a psychoactive substance use disorder (SUD) also presented at least one mental disorder (Timko, 2019).

Particularly for the Colombian case, in terms of the prevalence of DP, the results show that this condition is increasing. According to the official sources (Ministerio de Salud y Protección social, 2018), there was an increase in the attention given to people with DP: in 2009, 9419 people were reported to have received attention for this condition, while approximately 28000 patients were treated for it in 2017 (Sanchez Correa, 2021), with a higher percentage of men (64.6%) compared to women (35.4%).

So far in Colombia, it has been reported that most patients are distributed in the age group of 15 to 34 years old (49%); for 2017, the group comprised between 15 to 19 years old occupied 16%, followed by the group of 20 to 24 years old with 13.5%. These results suggest adolescents and young adults in Colombia are part of a critical group of vulnerability (Sanchez Correa, 2021); therefore, the high prevalence, psychosocial, economic, and health impact of dual pathology constitute a challenge for health professionals and society, and it is undoubtedly a public health problem in many countries nowadays.

In this sense, treating dual pathology in a comprehensive manner involves implementing several strategies that are necessary to reshape clinical and social interventions, treatment, and prognosis of the disease. Here, I highlight the most relevant ones to advance in effective approaches that are crucial for mitigating the devastating effect that DP has on patients, families, and society.

Diagnosis: Advancing towards a more precise diagnosis, considering the presence of an addictive disorder along with the presence of a mental disorder, entails additional training needs for clinicians, not only because of the challenges that the overlap of symptoms poses for diagnosis, but also because of the presence of different types of consumption and a spectrum of symptoms that constitute a complex clinical and psychopathological constellation (Torales et al., 2019). In

this sense, reviewing dimensional approaches rather than categorical ones in psychopathological diagnostic differentiation could contribute to redefining levels of severity and clinical deterioration, which would help improve treatment strategies according to the functional impairment presented by patients. This is possible by refining clinical tools to identify the present mental illness and type of consumption, determining their frequency, intensity, and time of consumption, as well as the scaling of symptoms that would also contribute to delineating clinical subtypes within DP.

Better diagnosis is fundamental and modifies the course and prognosis of the disease; different studies have indicated that substance use disorders, beyond contributing as a risk factor for developing a psychiatric disorder (Barkus & Murray, 2010; Szerman et al., 2017), also modify the course and prognosis of mental illness. Similarly, with psychopathological deterioration, the subject becomes more prone to substance use (Kessler, 2004). With all this, it is then crucial to refine the classification of clinical profiles within DP, analyzing dimensional approaches to expression and severity of symptoms, which could redirect and impact treatment schemes, recognizing the psychopharmacological and psychotherapeutic alternatives.

Medical Assistance Services: One of the difficulties faced by patients with DP is the availability and integration of various support services and access to expert treatment programs for this type of patient. In this regard, it is urgent to establish institutional synergies among support services that implement appropriate classification schemes within the clinical spectrum of DP (Szerman, 2016). Furthermore, eliminating barriers to access to health services by enabling protocols for early clinical interventions could be very useful in risk assessment, as well as activating early alerts that facilitate these patients' access to more effective intervention services, which will improve logistics for timely access to specialized clinical services. This alternative promotes primary prevention and could take immediate contingency actions, avoiding functional deterioration and decreasing the physical and psychosocial risk of the people in vulnerable contexts.

Stigma and Discrimination: citizen commitment to inclusion is essential in the reconstruction of social fabric for these patients. Individuals with DP indicate the influence of different socialization settings such as the neighborhood and school, and the importance of peers in the experimental consumption stages. Likewise, intervening in stereotypes related to consumption and mental illness is essential to support psychosocial disentanglement (Richter et al., 2019). It is unfortunate how false beliefs distort the perception of illness and lead to simplistic and negative categories around the problem, which generates hostility, prejudice, and ends in discrimination and social exclusion. Our society needs to advance in the understanding of DP, gaining more reflection and prosociality while decreasing prejudice and discrim-

ination. Education on mental health from school stages and families initiates this work. We need more mental health education, early recognition of risks, which is a psychosocial contingency asset and health determinant that is still not easy to estimate, but it is decisive in the prognosis of mental illnesses and addictions.

Treatment: Initially and since before 2009, many of the randomized controlled trials to intervene addictive disorders had not included the presence of psychiatric disorders within the addiction spectrum (Sellman, 2010), and treatments were focused on psychosocial approaches. However, with the advancement of science, the need to treat comorbid disorders refocused research on the neurobiology underlying dual pathology. According to the findings, medications that consider the role of opioid agonists could help in therapeutic adherence and contribute to the effects of other medications or serve as support in psychotherapeutic maintenance. So far, different studies have indicated the importance of agonist treatments, particularly in those subjects with DP who present opioid dependence. However, the most promising results are comprehensive interventions, those that combine pharmacological treatments and psychosocial and behavioral interventions. If the family group is added as a supportive co-therapist bet, the results could be even better. Unfortunately, very few families of patients with DP are responsibly involved in treatment in and out of treatment institutes.

It is likely that in the near future there will be discoveries that will reformulate pharmacological treatment schemes, as science is now looking in depth at alterations in the mesolimbic reward system, analyzing the reward deficiency syndrome and leading to low dopaminergic stimulation, which is observed in impulsive and addictive behaviors. Currently, research continues to advance in the likely molecular targets that suggest strategic psychopharmacological targets to intervene DP. In this regard, one of the most suggestive models to address the neurobiology of impairment in dual pathology is the Volkow et al. Model (2007), which proposes four pathways to explain the etiopathogenesis of addiction and therefore the complexity when proposing psychopharmacological routes of treatment (Montes Reula et al., 2016):

- a. Reward circuits that regulate stimulation and impact subcortical structures such as the amygdala and striatum.
- b. Motivational circuits that regulate motivation and behavior and are explained by the orbitofrontal cortex and anterior cingulate cortex.
- c. Inhibitory circuits, which are responsible for suppressing or controlling impulses. These actions are closely related to dorsolateral lateral orbitofrontal cortex and anterior cingulate cortex.
- d. Memory circuits that modulate memory and could explain repetitive behavior. These circuits are related to subcortical areas, such as the amygdala.

Accordingly, having an insight into dual pathology and the neurobiology involved in the etiopathogenesis of the disease will delineate new intervention strategies from psychiatry and toxicology, and will impact the evolution of DP in relation to treatment regimens.

Consequently, the optimal treatment for DP should include a combination of pharmacological and psychotherapeutic therapies, as well as an integrated care approach, as this approach benefits most from the integrated model, which combines treatment guidelines for both mental illness and drug dependence.

In addition to pharmacological treatment, it is then necessary to incorporate a psychotherapeutic process. Unfortunately, there is still not enough evidence on specific psychotherapies for DP or its scope as monotherapy, although different psychotherapeutic approaches, such as cognitive behavioral therapy, regulation techniques through contingency management, motivational interviewing, psychoeducation and family therapy, have been repeatedly used in DP, which means new therapeutic alternatives have begun to gain strength. Some studies have opened the field for third generation therapies, in particular, it has been found that interventions using mindfulness (IBM), dialectical behavioral therapy (DBT), and acceptance and commitment therapy (ACT), could contribute to improve adherence and favor containment in withdrawal periods. With all these new findings, the challenge could be operationalized in DP subtypes, who could respond better to different third-generation therapies, which implies not only the development of more research, but also the training of more professionals who can implement different types of psychotherapy in integrated treatment management (Andrade et al., 2021; Flynn et al., 2019; Perry et al. 2019).

Therefore, frontal disorders in DP permeate the adequate performance of executive function (EF), activities of the frontal lobes and, as a whole, the processes of supervision, regulation, execution, and readjustment of behaviors necessary for the achievement of learning-mediated goals. This has an impact on social behavior, cultural and contextual adaptation, from flexibility, problem solving, and decision making (Duijkers et al., 2016).

For this reason, implementing protocols that allow discriminating the most affected cognitive domains, and neurorehabilitate through neuropsychological tasks, strengthening the cognitive skills of patients with DP, is a conjunctural need in the reintegration and subsequent recovery of this population to society (Sohlberg & Mateer, 2001).

Currently, the “School against drug addiction, Luis Carlos Galán Sarmiento”, (<https://escuelacontraladrogadiccion.gov.co>) of the Government of Antioquia, has played a relevant role in the evaluation and implementation of an intervention protocol in Dual Pathology. From this governmental institution, actions have been developed from research to implement a neurorehabilitation protocol for

patients with DP, in addition to a psychotherapeutic intervention of patients and support to families, in order to advance the recovery of patients. Recently, the School against drug addiction in conjunction with the EAFIT University, launched a neuropsychological protocol to estimate which executive domains were the most affected in DP in Antioquia population. Their research managed to determine that the domains of Flexibility, Cognitive Inhibition, and Planning, were more altered than other cognitive domains, but also that patients, after a cognitive rehabilitation plan, improved performance in these cognitive processes.

These findings are promising in relation to the advantages of incorporating neurorehabilitation processes into the integrated intervention model, and they also suggest alternatives for neurocognitive training for early prevention in populations at risk for DP.

In the future, the challenge with these results is to expand the sample size, to advance in the clinical stratification of the sample, and that other groups in the world incorporate neurorehabilitation to the model of intervention and treatment of dual pathology.

In summary, advances in dual pathology should prioritize the following aspects as the central axis of functional recovery in this type of patients with the purpose of improving: 1), manage from the health and governmental systems, health policies that allow progress in early detection, and adjusting everything related to comprehensive care is essential to reduce the years lost due to disability that DP adds; 2), advance in the processes of classification and delineation of subtypes, which can enable beyond the categorical models, dimensional approaches that can help to estimate the severity, understanding, and obliquity of DP; 3), advance in research from evidence-based psychology, of other psychotherapeutic models, such as third generation therapies, will allow progress in multicomponent psychotherapeutic intervention schemes, with customizable approaches, and at different times in the evolution of treatment, which would certainly impact adherence, promote abstinence in some cases and would have effects on the prevention and duration of relapses; 4), including mental health training in early school education is not only an asset for psychosocial health contingency, but also reduces the stigmatization of DP and enables actions for the early detection of psychopathological risks; 5), advancing with the evaluation, clinical characterization and neurorehabilitation of neurocognitive alterations, neuropsychological rehabilitation contributes to psychotherapeutic achievement, contributes to social insertion through the recovery of cognitive competences, improves cognitive reserve, increases awareness of the disease, and therefore favors therapeutic adherence to intervention programs in DP.

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