



Commentary

Clinical epidemiology of substance use disorders: Understanding patterns, sharing knowledge, planning interventions

Substance use disorders (SUDs) make a large contribution to the burden of diseases, and the information gathered from affected individuals is often insufficient to inform adequate interventions¹. The implementation and expansion of epidemiological surveys can fill data gaps and offer the opportunity to understand the progression of the disease, share global strategies and identify the best local solutions. Due to the concerted efforts of health professionals and patients to alleviate the consequences of the disease, the observation of the natural course of SUDs has been changing into the evaluation of its course in response to treatment following evidence-based approaches. Thus, clinical epidemiology has extended from the estimation of incidence and prevalence of diseases in a population, to include the long-term follow up of patients and anticipate the full development of data-based epidemiology of prevention.

The study by Chavan *et al*² in this issue is the first comprehensive SUD report of Punjab, India and is part of the National Mental Health Survey. Using a reliable sampling method and standardized procedures, the researchers found a prevalence of alcohol and other SUDs higher than 10 per cent in the region. In particular, more than one of three households in Punjab had at least one person with SUD, alcohol was the most commonly used substance, tobacco had a culturally bound limited use and opioids were predominant among persons with illicit drug use. Future surveys and a longitudinal observation will help define disease patterns and monitor the validity of the interventions. Interestingly, the authors have identified and highlighted the existence of an 80 per cent treatment gap for the local SUD population. Globally, about one in six people who suffer from SUDs receive treatment each year, and the accessibility and availability of services for such conditions are limited³. The gap is wide if we compare one in 18 who

receive treatment in Africa with one in five who are treated in the US and Europe. This points to large disparities between regions while confirming overall the inadequacy of the response³. Without overlooking significant socio-cultural differences, there is a global need to improve disease education, enhance prevention and promote awareness and treatment readiness while reducing the stigma. However, this would be insufficient if we do not step up our efforts to identify and abate treatment barriers.

A paradigmatic example is represented by the current opioid epidemic, a major public health threat accounting for 76 per cent of SUD-related deaths worldwide⁴. No policy is likely to substantially reduce these numbers in the short term, but predictive models suggest that adding medication and psychosocial support to overdose prevention and prescription control can bring about earlier results⁵. Thus, priority must be given to measures that reduce cost and increase long-term availability and accessibility of treatment to larger proportions of individuals with substance use problems than previously considered. This includes drug users who are not in severe conditions but still require interventions to prevent an escalation in their disability and comorbidity related to drug use.

About 12 million people have reported non-medical and illicit opioid use (problem use) in the US, based on the National Survey on Drug Use and Health⁶. This equals 3-4 times the amount of those who are more severely affected and have been the target of treatment. More concerning, the numbers of problem users have doubled in four years⁷, suggesting that this group is a main reservoir of a developing opioid use disorder (OUD). People with a few clinical symptoms are difficult to identify and do not usually seek help although they are at risk of developing a disease. Problem opioid users are no different, and those

among them who have difficulty in complying with opioid therapy for pain can often be encountered in routine medical care. Close monitoring and coaching of these patients should be offered at the doctor's office and in stepwise fashion, with the option to deliver opioid antagonist or agonist substitution therapy as appropriate to those ones at risk of transitioning from a mild to a moderate use disorder. The feasibility and benefits of early interventions during the development of the disease have to be scientifically confirmed and could provide a new and effective preventive approach to SUDs.

Effective medications are gradually becoming more familiar to and 'user-ready' for primary care physicians, general practitioners and other healthcare professionals previously marginal to SUDs care. This has implied a public health and clinical discussion to change old policies and recommendations for treatment that were tailored to speciality clinics. In particular, the use and implementation of medication-assisted treatment (MAT) for OUD is now challenging some existing procedures. There are indications that buprenorphine and methadone treatments can be safely and efficiently delivered outside strict guidelines or the limitations imposed by highly regulated programmes⁸ while improving the quality of monitoring through the participation of multiple healthcare professional and the shared use of electronic health records and controlled substances reporting systems. The use of and compliance with opioid antagonist medications are being promoted by the adoption of long-acting naltrexone formulations and by improving treatment initiation outside the cautionary limits of inpatient detoxification and prolonged preliminary abstinence⁹.

The benefits of creating a large network of healthcare professionals who are willing to be more closely involved with OUD care, such as pharmacists, nurse practitioners and physician assistants, and offering access to multiple points of treatment for OUD to the patients can be significant and potentially long reaching. In addition to extended services, easy accessible community settings and improved treatment monitoring, a relative reduction in MAT prescribers' workload allows them to take new patients in treatment. More broadly, a significant increase in the capacity of other professionals to deliver treatment sets the stage to expand access to interventions for a wider range of SUDs. In sum, the growing awareness of the importance of a patient-centred approach argues for better-individualized care and for the overhaul of

redundant practices that create barriers to treatment access and continued care.

The study of the epidemiology of SUDs is commonly included in mental health surveys. The investigation by Chavan *et al*² found that 13 per cent of the SUDs population had other psychiatric problems, depression being the prevalent one by far (5.7%). Co-morbid SUDs are the most common psychiatric conditions associated with mental disorders and are present in larger amount in patients who receive protracted treatment and are more thoroughly evaluated and closely observed. The pooled prevalence of co-morbid SUDs and affective disorders can top 50 per cent in methadone-treated patients¹⁰. More research is needed on the diagnosis, progression and treatment of mental disorders among patients with SUDs and to determine the nature and entity of their influence on the outcome of substance use treatment. Further, given the urgent need to improve utilization of evidence-based pharmacotherapy for OUD to reduce morbidity and mortality¹¹, the evaluation of medication interaction and adverse effects requires a thorough study to produce widely available guidelines for dual diagnosis populations. Methadone and buprenorphine have major interactions with commonly prescribed psychotropic medication, including increased risk of sedation, confusion and decreased respiratory rate. The cardiac effects, such as QT prolongation on electrocardiogram, and serotonergic stimulation are other synergic and potentially lethal risks¹².

The relationship between mental health and SUDs is likely bidirectional and their co-occurrence is associated with a number of negative consequences, including relapse, hospitalizations, overdoses and suicide¹³. These complications are now on the rise and, needless to say, highlight the importance of studying the best way to manage such co-morbid conditions. The treatment of concurrent SUDs and chronic medical diseases has not been the focus of attention besides the role played by chronic pain, but it is probably as important in terms of quality of life and long-term outcomes of the patients¹⁴. Conditions such as diabetes and cardiovascular diseases require regular administration of life-saving medications and their presentation and full compliance with therapy are negatively affected by SUDs¹⁵. These diseases in turn may influence SUDs expression, course and prognosis. The identification of severely affected high-risk populations is another task unique to epidemiological studies, and it is a call for more effective interventions¹⁶.

In conclusion, the ubiquity and high prevalence of SUDs along with their co-morbid conditions make prevention, evaluation and treatment, a priority of the routine clinical practice in primary care that constitutes the gateway to health care management. The clinical epidemiology of SUDs is the foundation for understanding the intertwining of developmental, genetic and environmental correlates and may help clinicians to better tailor treatments to individual patients. In this sense, the longitudinal use of epidemiological surveys offers an increasingly sensible observational tool to verify the efficacy of treatments, make corrections where needed and identify areas in need of improvement. On this base, more effective primary prevention programmes can be developed with specific targets and measurable outcomes.

Financial support & sponsorship: The authors acknowledge financial support from the U.S. National Institutes of Health (UG1DA040317, R01MD007658). The opinions expressed in this article are solely those of the authors and do not represent the official position of the U.S. government.

Conflicts of Interest: The first author (PM) received research funding from NIH, Orexo, and Alkermes Inc, and consultation fees from Guidepoint Global and Alkermes Inc. The second author (L-T W) received research support from Patient-Centered Outcomes Research Institute, Centers for Disease Control and Prevention, and Alkermes Inc., USA.

Paolo Mannelli^{1,*} & Li-Tzy Wu^{1,2,3,4}

Departments of ¹Psychiatry & Behavioral Sciences & ²Medicine (Division of General Internal Medicine), Duke University Medical Center, ³Duke Clinical Research Institute & ⁴Center for Child & Family Policy, Sanford School of Public Policy, Duke University, Durham, NC, USA

*For correspondence:
paolo.mannelli@duke.edu

Received January 1, 2019

References

- Whiteford H, Ferrari A, Degenhardt L. Global burden of disease studies: Implications for mental and substance use disorders. *Health Aff (Millwood)* 2016; 35 : 1114-20.
- Chavan BS, Garg R, Das S, Puri S, Banavaram AA. Prevalence of substance use disorders in Punjab: Findings from National Mental Health Survey. *Indian J Med Res* 2019; 149 : 489-96.
- United Nations Office on Drugs and Crime. World Drug Report 2015, United Nations Publication, Sales No. E.15.XI.6. 2015.
- United Nations Office on Drugs and Crime. World Drug Report 2018, United Nations Publication, Sales No. E.18.XI.9. 2018.
- Pitt AL, Humphreys K, Brandeau ML. Modeling health benefits and harms of public policy responses to the US opioid epidemic. *Am J Public Health* 2018; 108 : 1394-400.
- Substance Abuse and Mental Health Services Administration. *Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health*. Rockville, MD: Center for Behavioral Health Statistics and Quality, SAMHSA; 2017.
- Substance Abuse and Mental Health Services Administration. *Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings*. Rockville, MD: SAMHSA; 2013.
- Martin SA, Chiodo LM, Bosse JD, Wilson A. The next stage of buprenorphine care for opioid use disorder. *Ann Intern Med* 2018; 169 : 628-35.
- Bisaga A, Mannelli P, Sullivan MA, Vosburg SK, Compton P, Woody GE, et al. Antagonists in the medical management of opioid use disorders: Historical and existing treatment strategies. *Am J Addict* 2018; 27 : 177-87.
- Pedrelli P, Iovieno N, Vitali M, Tedeschini E, Bentley KH, Papakostas GI, et al. Treatment of major depressive disorder and dysthymic disorder with antidepressants in patients with comorbid opiate use disorders enrolled in methadone maintenance therapy: A meta-analysis. *J Clin Psychopharmacol* 2011; 31 : 582-6.
- Volkow ND, Frieden TR, Hyde PS, Cha SS. Medication-assisted therapies – tackling the opioid-overdose epidemic. *N Engl J Med* 2014; 370 : 2063-6.
- McCance-Katz EF, Sullivan LE, Nallani S. Drug interactions of clinical importance among the opioids, methadone and buprenorphine, and other frequently prescribed medications: A review. *Am J Addict* 2010; 19 : 4-16.
- Bohnert AS, Ilgen MA, Ignacio RV, McCarthy JF, Valenstein M, Blow FC, et al. Risk of death from accidental overdose associated with psychiatric and substance use disorders. *Am J Psychiatry* 2012; 169 : 64-70.
- Wu LT, Zhu H, Ghitza UE. Multicomorbidity of chronic diseases and substance use disorders and their association with hospitalization: Results from electronic health records data. *Drug Alcohol Depend* 2018; 192 : 316-23.
- Ghitza UE, Wu LT, Tai B. Integrating substance abuse care with community diabetes care: Implications for research and clinical practice. *Subst Abuse Rehabil* 2013; 4 : 3-10.
- Wu LT, Ghitza UE, Zhu H, Spratt S, Swartz M, Mannelli P, et al. Substance use disorders and medical comorbidities among high-need, high-risk patients with diabetes. *Drug Alcohol Depend* 2018; 186 : 86-93.