Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Letter to the Editor

Strategies to maintain persistence of opioid agonist therapy during the novel coronavirus pandemic in Taiwan

With the worldwide increasing incidence of drug use disorders in the past years, more countries are devoting resources to develop strategies to curb the rising rate (UNODC, 2019). However, the world is currently under the enormous burden of the COVID-19 pandemic, probably affecting the healthcare of patients with drug use disorder (Becker and Fiellin, 2020). Opioid agonist therapies (OAT), such as methadone and buprenorphine, are the mainstay treatment to reduce patients' drug dependence, whereby successful treatment relies on good persistence of patients on OAT. However, during the pandemic period, patients may be reluctant to visit drug addiction treatment centers (DATC) to avoid infection with COVID-19 (Rockville, 2020). To ensure OAT treatment continuity during the COVID-19 pandemic, some countries, such as the USA, have implemented contingency planning for take-home doses of methadone, raising clinical concerns over OAT non-adherence and adverse outcomes (Leppla and Gross, 2020).

Taiwan has established 123 hospital affiliated DATC covering entire regions of the country in order to increase the rate of OAT. Moreover, Taiwan has implemented an Outreach Service Station Program and established 38 satellite DATC to improve the accessibility of OAT for suburban and rural areas. Tainan City metropolitan area has the highest coverage rate of satellite DATC in Taiwan. We found that during the COVID-19 pandemic, patients in Tainan were more willing to visit a satellite DATC than a hospital DATC, because in the satellite DATC there were fewer people present and hence there was less concern over COVID-19 infection. Surprisingly, we found the attendance rate of patients at satellite DATC was 96.2 % (among 720 patients in 7 DATC) during the peak period of the COVID-19 threat from February to May 2020, which is higher than during the same period in 2019 (94.9 % among 766 patients in 7 DATC). However, the attendance rate at hospital DATC decreased approximately 6.4 % from February to May 2020, compared to the same period in 2019.

There are some likely explanations for the good attendance rate for OAT. First, the government budgeted a total subsidy of 12,500,000 New Taiwan Dollars (NTD) (approximately USD $417,000.00) to relieve the financial burden of patients receiving OAT. As a result, patients' co-payment for an OAT visit is only 150 NTD (approximately USD $5.00). This is especially important given the high unemployment rate during the COVID-19 pandemic. Second, the “Parallel-track Case Managers” program which aims to recruit two case managers for both the hospital and satellite DATC, facilitates a better connection of patients between hospital and satellite DATC, helping to dispel patients' misgivings while transferring. The case managers can instruct on appropriate management to avoid COVID-19 infection while visiting a satellite DATC and also follow-up with patients on the outcomes of OAT. Although our study did not conduct any cost-savings evaluation of these approaches, based on the studies by Krebs et al. (2018) (2017), the total costs due to OAT mismanagement could be far greater than the costs of implementing the approaches taken in Taiwan.

Take-home methadone is not allowed in Taiwan due to concerns over non-adherence and safety issues. However, our government has provided financial support for patients and also employed parallel-track case managers to maintain the persistence of patients on OAT through DATC even during the COVID-19 pandemic. Although these approaches are costly, they might be worth consideration to reduce concerns over OAT interruption during the COVID-19 pandemic, to better manage issues from patients with drug use disorder and to improve public health.

Contributors

All authors contributed to the writing of the letter. All authors have reviewed and approved the final letter.

Sources of financial support

No.

Declaration of Competing Interest

The authors report no declarations of interest.

References

Becker, W.C., Fiellin, D.A., 2020. When epidemics collide: coronavirus disease 2019 (COVID-19) and the opioid crisis. Ann. Intern. Med.
Krebs, E., Urada, D., Evans, E., Huang, D., Heer, Y.-I., Nosyk, B., 2017. The costs of crime during and after publicly funded treatment for opioid use disorders: a population-level study for the state of California. Addiction 112 (5), 838-851.
Krebs, E., Enns, B., Evans, E., Urada, D., Anglin, M.D., Rawson, R., Heer, Y.-I., Nosyk, B., 2018. Cost-effectiveness of publicly funded treatment of opioid use disorder in California. Ann. Intern. Med. 168 (1), 10-19.
Leppla, I.E., Gross, M.S., 2020. Optimizing medication treatment of opioid use disorder during COVID-19 (SARS-CoV-2). J. Addict. Med.
Rockville, F.L., 2020. Substance Abuse and Mental Health Services Administration. Opioid treatment program (OTP) guidance.
UNODC, 2019. The World Drug Report 2019. Accessed at https://www.unodc.org/unodc/en/frontpage/2019/June/world-drug-report-2019_35-million-people-worldwide-suffer-from-drug-use-disorders-while-only-1-in-7-people-receive-treatment.html on 26 June 2019.
Cheng-Chan Shih\textsuperscript{a,b,c}  \\
\textsuperscript{a} School of Pharmacy, Institute of Clinical Pharmacy and Pharmaceutical Sciences, College of Medicine, National Cheng Kung University, Tainan, Taiwan  \\
\textsuperscript{b} Public Health Bureau, Tainan City Government, Taiwan  \\
\textsuperscript{c} Drug Abuse Prevention Center, Tainan City Government, Taiwan  \\

Yi Chen\textsuperscript{a,b}  \\
\textsuperscript{a} Public Health Bureau, Tainan City Government, Taiwan  \\
\textsuperscript{b} Drug Abuse Prevention Center, Tainan City Government, Taiwan  \\

Shih-Chieh Shao\textsuperscript{a,b}  \\
\textsuperscript{a} School of Pharmacy, Institute of Clinical Pharmacy and Pharmaceutical Sciences, College of Medicine, National Cheng Kung University, Tainan, Taiwan  \\
\textsuperscript{b} Department of Pharmacy, Keelung Chang Gung Memorial Hospital, Keelung, Taiwan  \\

Edward Chia-Cheng Lai*  \\
School of Pharmacy, Institute of Clinical Pharmacy and Pharmaceutical Sciences, College of Medicine, National Cheng Kung University, Tainan, Taiwan  \\
E-mail address: edward.lai@mail.ncku.edu.tw.

*Corresponding author at: School of Pharmacy, Institute of Clinical Pharmacy and Pharmaceutical Sciences, College of Medicine, National Cheng Kung University, Tainan, No.1, University Road, 701, Taiwan.