The impact of the March 2020 lockdown on the cardiometabolic risk of male forensic and rehabilitation patients

Dr Nicholas Dodough, Dr Jaspreet Phull, Dr Jaswant Singh, Jackie Sendell
(LPFT, United Kingdom)

Background

In December 2019, the World Health Organization was informed about a new respiratory illness caused by a beta coronavirus believed to have originated from Wuhan, China. In March 2020, the coronavirus now called COVID 19 was classified as a pandemic after over one million confirmed cases and over one hundred thousand deaths. (Zhu et al., 2020). Given the surge in the number of COVID 19 cases, the UK government announced its first lockdown on 23 March which restricted the movement of people outside of their homes (Gov.UK, 2020) These social restrictions had an important impact on the physical activity pattern of people (Federighi Baisi Chagas et al., 2020.). Boredom and stress also caused by quarantine has encouraged people to overeat especially foods rich in sugar because of its positive effect on their mood. This can therefore increase the risk of obesity and cardiovascular disease (Di Renzo et al., 2020.) It is well documented that people with comorbidities have poorer outcomes if they become infected with COVID 19. The Centers for Disease Control and Prevention reported that hospitalizations were six times higher among patients with a reported underlying condition (45.4%) than those without reported underlying conditions (7.6%). Deaths were 12 times higher among patients with reported underlying conditions (19.5%) compared with those without reported underlying conditions (1.6%) (Stokes, 2020) In addition to those with physical health comorbidities, people with severe mental illnesses are also at an increased risk of becoming infected since they live in supported accommodations and gather in places such as psychiatric inpatient wards, homeless shelters and prisons (Barber, Reed and Jones, 2020.) Consequently, it is prudent to investigate the effect of lockdown on the cardiometabolic risk of inpatients with mental health disorders. As far as we know no studies before have evaluated the impact of isolation measures on cardiometabolic risk factors on inpatients with severe mental illnesses.

Methodology

Retrospective data from September 2019 to September 2020 (six months before and after the March 2020 lockdown) was collected by evaluating the physical health records of male patients in their electronic notes and physical health folders in a low secure forensic ward and two rehabilitation units.
The following parameters for cardiometabolic disease were measured and tabulated
- Age
- Height, body mass index
- HbA1c, triglycerides, total cholesterol and HDL levels
- Use of antihypertensive agents

Inclusion criteria:

- Male patients admitted to the respective wards at the start of the observational period the end of the observational period
- Patients with their weight and BMI recorded consistently each month throughout the observational period

Exclusion criteria

- Patients admitted to the respective wards after the start of the observational period
- Patients without consistent monthly BMI recordings throughout the observational period.

Results

Number of patients with BMI values within study period: 34 patients
Number of patients with blood results within study period: 26 patients
Average age of patients: 36.76 years
Average height: 1.64 metres

BODY MASS INDEX

1.0 Line graph showing changes in Body mass index six months before and after the March 2020 lockdown
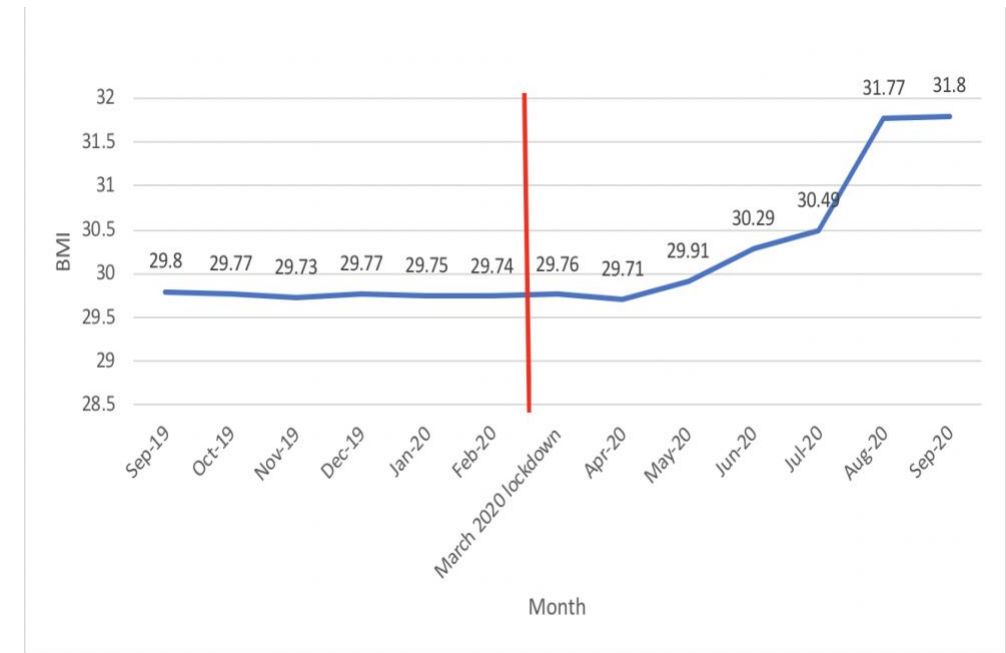
The results from the 6-month interval before the March 2020 lockdown (M=0, SD = 0) and the 6-month interval after the March 2020 lockdown (M = 0.9, SD=4.16) indicate that the March 2020 lockdown resulted in an increase of BMI, t(5) =-2.42, P=0.036. The result is significant at p<0.05
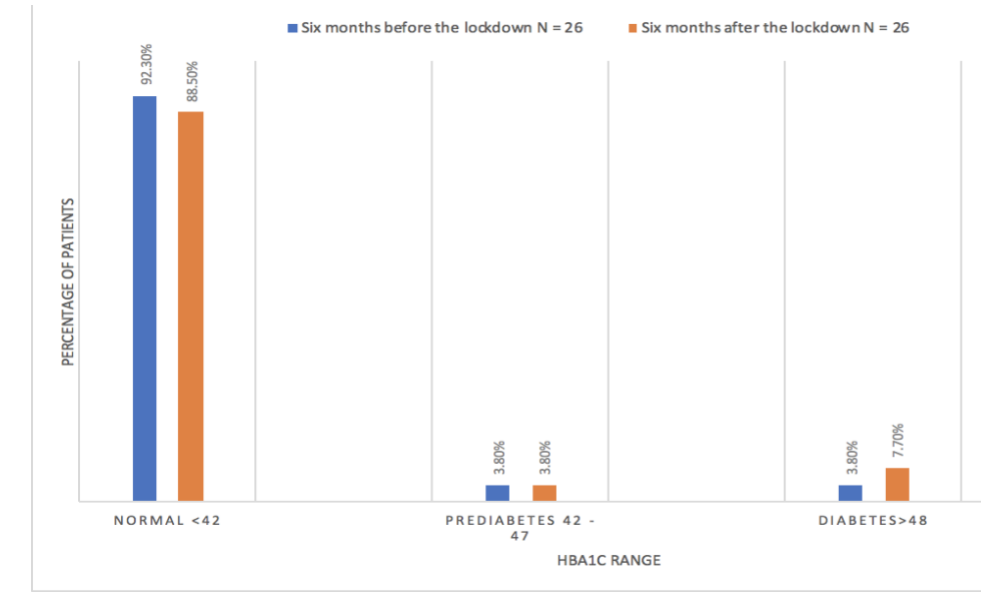
BLOOD PRESSURE

2.0 Bar graph showing dose changes of antihypertensive agents six months before and after the March 2020 lockdown
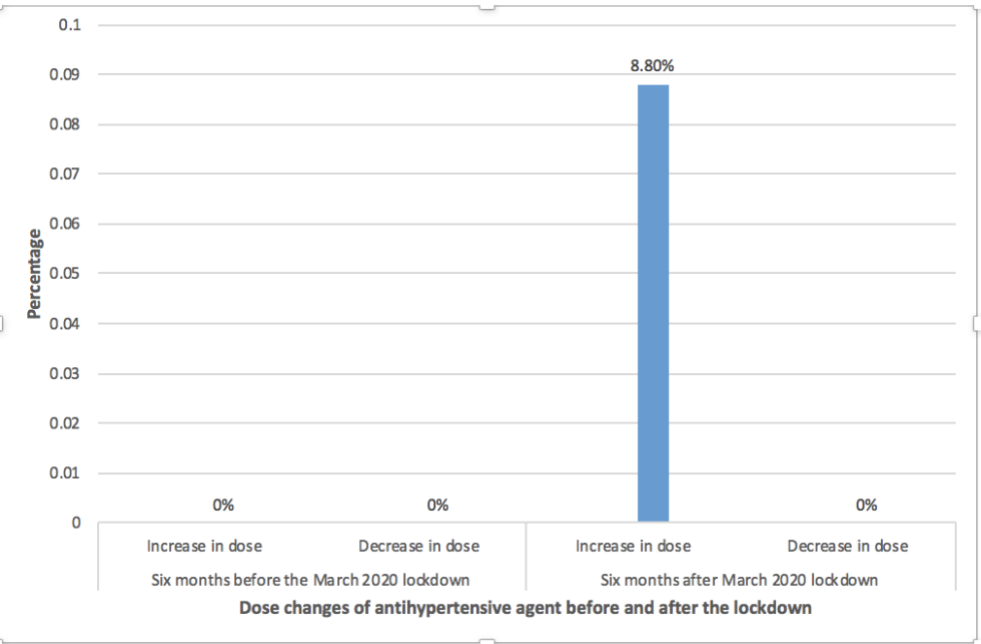
GLYCEMIC CONTROL

3.0 Bar graph showing the changes in HBA1c six months before and after the March 2020 lockdown

SERUM LIPID LEVELS

4.0 Table showing the changes in serum lipid levels before and after the start of the March 2020 lockdown

Lipid parameter	Average value		
	Six months before lockdown	Six months after lockdown	Difference
Triglycerides	2.02	2.19	0.17
Total cholesterol	4.05	4.30	0.25
HDL	1.08	1.02	0.06

Limitations

- Waist circumference was not measured during the study period preventing us from examining all of the features of metabolic syndrome.
- HbA1c as a marker of glycemic control is limited by sampling type. Since HbA1c reflects glucose levels of the last 3 months it may not accurately indicate glycemic control within the two study periods (before and after the lockdown) depending on when the test was performed.
- A longer sampling period, and greater sample size would have benefited the study in producing more reliable results.
- The quantity of section 17 leave accessed by the sample was not measured. This would have been an indicator for physical activity.
- Diet, nutritional status and levels of exercise data (such as access to the gym) was not available and therefore not reported.
- The antipsychotics prescribed to the sample was not measured as some neuroleptic agents have a greater propensity for weight gain than others.
- There was no control group to use as a baseline to compare groups and assess the effect of the lockdown restrictions.
- Qualitative data such as the patient views of lockdown restrictions on stress levels, diet and exercise were not assessed.

Recommendations

- To raise metabolic awareness of the impact of the lockdown restrictions on cardiometabolic risk in people with SMI and the general public.
- More robust monitoring of metabolic changes of hospitalized patients with severe mental illnesses.
- To regularly review the needs for hospitalized patients with SMI in the climate of COVID 19.
- People with severe mental illness should therefore be prioritized in vaccine allocation strategies given the increased morbidity.
- Since high BMI along with severe mental illness are acknowledged risk markers for poorer outcome in COVID 19 – the authors recommend additional efforts are made to safeguard such individuals.

Conclusions

- There appears to be a positive correlation between the onset of lockdown and an increase of BMI, worsening of blood pressure, worsening of glycemic control and worsening of lipid metabolism.
- This study showed that lockdown measures increased the chance of acquiring cardiometabolic risk factors in forensic inpatients.
- Although this study did not evaluate the specific patterns of behaviour caused by the lockdown to bring about these results, it is postulated that it may be a combination of decreased physical activity due to restrictions on access to section 17 leave, poor eating habits due to boredom and increased stress levels for not being able to access leave and fear of the virus itself.

References

(1)   Barber, S., Reed, L. and Jones, N. (2020). *Severe mental illness and risks from COVID-19*. [online] CEBM. Available at: https://www.cebm.net/covid-19/severe-mental-illness-and-risks-from-covid-19/.

(2)   Di Renzo, L., Gualtieri, P., Pivari, F., Soldati, L., Attinà, A., Cinelli, G., Leggeri, C., Caparello, G., Barrea, L., Scerbo, F., Esposito, E. and De Lorenzo, A. (2020). Eating habits and lifestyle changes during COVID-19 lockdown: an Italian survey. *Journal of Translational Medicine*, 18(1).

(3)   Federighi Baisi Chagas, E., Biteli, P., Moreira Candeloro, B., Angelo Rodrigues, M. and Henrique Rodrigues, P. (2020). Physical exercise and COVID-19: a summary of the recommendations. *AIMS Bioengineering*, 7(4), pp.236–241.

(4)   GOV.UK (2020). *PM address to the nation on coronavirus: 23 March 2020*. [online] GOV.UK. Available at: https://www.gov.uk/government/speeches/pm-address-to-the-nation-on-coronavirus-23-march-2020

(5)   Stokes, E.K. (2020). Coronavirus Disease 2019 Case Surveillance — United States, January 22–May 30, 2020. *MMWR. Morbidity and Mortality Weekly Report*, [online] 69. Available at: https://www.cdc.gov/mmwr/volumes/69/wr/mm6924e2.htm.

(6)   Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., Zhao, X., Huang, B., Shi, W., Lu, R., Niu, P., Zhan, F., Ma, X., Wang, D., Xu, W., Wu, G., Gao, G.F. and Tan, W. (2020). A Novel Coronavirus from Patients with Pneumonia in China, 2019. *New England Journl*