

IMPACT OF COVID 19 PANDEMIC ASSOCIATED LOCKDOWN ON ADMISSIONS SECONDARY TO CARDIAC AILMENTS IN A TERTIARY CARDIAC CENTRE OF PAKISTAN

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ABSTRACT

Objective: To assess the impact of COVID 19 pandemic associated lockdown on the emergency patient visits and their management and outcome in a tertiary cardiac center of Pakistan

Study Design: Comparative cross-sectional study.

Place and Duration of Study: Rawalpindi Institute of Cardiology from Mar 2020 to May 2020.

Methodology: Records of patients presenting at the emergency department (ED during the lockdown period (23rd March 2020 to 7th May) was assessed. Similarly records of patients presenting to the emergency department during the same period last year was assessed. The two were than compared. Parameters compared included the gender difference, the underlying disease, the number of ST elevation myocardial infarction (STEMI) patients, patients undergoing lysis and primary percutaneous coronary intervention (PCI) and the mortality. Data analysis was done in terms of numbers and percentage change in each parameter.

Results: There was considerable decrease in the number of patients visiting the emergency department (32.48%) i.e from 13326 to 8997. In addition, the ST elevation myocardial infarction (STEMI) number declined considerably (37.84%) as did the primary percutaneous coronary intervention (PCI) number (66.43%) and the number of patients coming with non ST elevation acute coronary syndromes (NSTEMI) (72.32%) and decompensated heart failure (86.86%). The overall emergency department mortality also reduced by 42.1%. There was however an increase in the percentage of ST elevation myocardial infarction (STEMI) patients lysed.

Conclusion: This study shows the dramatic decline in patient admissions with cardiac ailments in the emergency department of a tertiary care hospital highlighting the overall impact of morbidity and mortality secondary to the COVID 19 pandemic due to issues not directly related to COVID 19 and also gives us an eye opener to expect a high number of complicated cardiac patients coming to our hospital and to plan accordingly.

Keywords: COVID 19, lockdown, cardiac admissions, ST elevation myocardial infarction (STEMI) cases.

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INTRODUCTION

The COVID 19 has drastically impacted the health care systems worldwide¹. Developing countries, like Pakistan with a less developed health care system and facilities was always expected to have a more drastic impact from the COVID 19 pandemic compared to the developed countries². The first COVID 19 case in Pakistan was reported on 26th February 2020 and it did show a rapid surge in number especially due to large number of pilgrims returning from Iran. In a period of only 25 days the number increased to

7708 on 22nd March 2020³. To prevent the spread of the virus the Government of Pakistan on 22nd March 2020 announced that people should remain at home and should only go to a health care facility if they have serious condition requiring urgent medical attention⁴. The lockdown remained for a period of approximately 45 days and was eased out on 9th May 2020.

Rawalpindi Institute Cardiology a 300 bedded dedicated cardiac hospital is associated in Rawalpindi close to the federal capital, Islamabad. Being one of only few dedicated cardiac hospitals in the whole of northern Pakistan, the hospital has huge catchment area receiving patients from northern Punjab, majority of the Khyber Pakhtunkhwa, the Azad Kashmir and

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Gilgit Baltistan provinces. It is the only center in the northern part of the country with 24/7 primary percutaneous coronary intervention (PCI) facility for patients coming with acute ST elevation myocardial infarction (STEMI). Due to these two factors Rawalpindi Institute of Cardiology normal would receive a huge influx of patients; both as emergency and as outpatient. On the average in the year 2019, on a daily basis the institute received 3000 patients as an outpatient and 500 patients in the emergency department. In addition, up to 10-15 primary PCI procedures used to be done on a daily basis.

During the 45 days lockdown period, the outpatient department was closed with the hospital providing emergency services including the 24/7 primary PCI service for acute STEMI patients. However, it was decided that the stable patients with STEMI and patients with suspected COVID 19 symptoms would be lysed to prevent

going primary PCI and also to assess the mortality comparing it with the numbers during the same period last year.

METHODOLOGY

It was a retrospective comparative cross-sectional study conducted at Rawalpindi Institute of Cardiology.

The inclusion of this study was patients presenting to the emergency department with newly diagnosed or exacerbation of pre existing cardiac issue and exclusion were patients presenting with non-cardiac issue records of patients presenting at the ED during the lockdown period (23rd March 2020 to 7th May) and meeting the inclusion and exclusion criteria were assessed. This was done following approval by the institute's ethical review board (letter No. RIC/DCA/27/20). Written informed consent was taken from the individual patient as well. Similarly records

Table: Change in various important clinical conditions / treatment options during the COVID-19 associated lockdown period.

	Pre COVID 19 1 st April 2019 to 7 th May 2019	COVID 19 Lockdown: 1 st April 2020 to 7 th May 2020	Percentage Change
Total Emergency Department (ED) visits	13326	8977	32.48% decreased
Admission	1780	973	45.33% decreased
ST Elvation Myocardial Infarctions (STEMIs)	621	386	37.84% decreased
Primary Percutaneous Coronary Interventions (PCIs)	429	144	66.43% decreased
Lysis	54	87	61.11% increased
Late for lysis	192	155	19.27% decreased
Non ST Elevation Acute Coronary Syndromes (Non STEACS)	748	207	72.32% decreased
Decompensated Heart Failure (HF)	99	13	86.86% decreased
Overall death	124	78	42.18% decreased

risk of disease transmission to hospital staff and other patients. During this period, we were expecting that more serious patients visiting the ED and coming with acute STEMI for primary PCI would not change significantly.

The purpose of this study was to assess the impact of the COVID 19 associated lockdown on the number of patients coming to the emergency department (ED) including the patients under-

of patients presenting to the ED during the same period last year was assessed. The two were than compared. Parameters compared included the gender difference, the underlying disease, the number of STEMI patients, patients undergoing lysis and primary PCI and the mortality.

Being a retrospective analysis comparing two eras during the current and last years all patients presenting to the ED with cardiac issues

were included with no particular sample size or sampling needed. Data analysis was done in terms of numbers and percentage change in each parameter.

RESULTS

Total 22303 patients presenting to the emergency department during the two periods were assessed. 13326 patients presented during the pre COVID era while 8977 patients presented in the COVID era. Among all the patients 11486

The comparison of various parameters during the two visits is shown in fig-2.

As seen in the table and in the fig-1 & 2, there was considerable decrease in the number of patients visiting the ED (32.48%). In addition, the STEMI number declined considerably (37.84%) as did the primary PCI number (66.43%) and the number of patients coming with NSTEMACS (72.32%) and decompensated heart failure (86.86%). The overall ED mortality also reduced by 42.1%. There was however an increase in the percentage of STEMI patients lysed.

DISCUSSION

COVID 19 secondary to SARS CoV 2 virus has had a huge impact on the health care systems of the world. Pakistan, a developing country with its under developed health care system has also felt the impact with increase in the number of COVID 19 cases². The announcement of lockdown in various countries has had an affect on the number of patients with non COVID 19 related symptoms visiting both the emergency and outpatient departments^{5,6}. Similarly, the fear of contracting the virus has also prevented patients with either established heart disease and even patients with milder symptoms related to cardiac diseases visiting the ED for management with mostly those patients visiting the hospital with more severe disease symptoms thus increasing morbidity and mortality.

In this study we found some interesting findings. In view of the COVID 19 associated lockdown there was a decline in almost all kinds of patients presenting to the ED. The overall patients visiting ED declined by 32.48% and there was a drastic 66.43% decline in STEMI patients undergoing primary PCI procedures. Another drastic fall was seen in patients undergoing intervention for NSTEMACS (by 72.32%) both as a result of hospital policy of not doing intervention in low risk NSTEMACS patients and also such patients preferring medical therapy for minimal symptoms. Braiteh *et al*⁷ reported a decline of 36.4% in NSTEMACS cases due to COVID 19 associated lockdown in upstate New

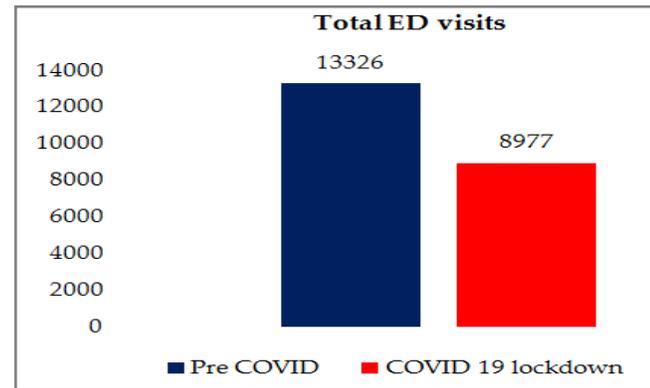


Figure-1: Total ER visits during the two periods.

(51.5%) were males while 10817 (48.5%) were females. The mean age of the patients was 56.4 years.

The number of patients coming during the

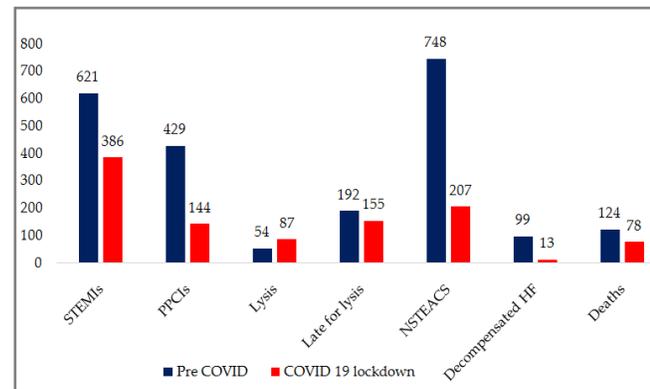


Figure-2: Comparison of different reasons of ED visits, management and outcomes.

two periods (pre COVID) and during COVID 19 and the percentage change is shown in table.

Graphical presentations of the parameters in the table are shown in fig-1 & 2.

York. The number of patients admitting with acute decompensated heart failure also reduced to 13 from 99 during similar period last year; again, showing that patients with milder symptoms now showing locally due to lockdown. Similar pattern was seen in the studies conducted by Gracia *et al*⁸ and Lantelme *et al*⁹ which showed a 38.0% and 31.0% decline in the number of STEMI admissions in United States and Spain respectively. The main reason obviously been the fear and apprehension of catching the COVID 19 infection preventing patients with chest pain going to hospitals¹⁰.

A lot of cardiac societies around the world have modified their guidelines as far as the management of acute STEMI is concerned. The Chinese Cardiology Society suggest thrombolysis rather than primary PCI among stable acute STEMI patients to prevent spread of the infection with coronary intervention only when the patient deteriorates¹¹. In contrast to this the American Heart Association (AHA) and Society for Cardiovascular Angiography and Interventions (SCAI) states that primary PCI remains the standard of care for STEMI patients at PCI capable hospitals when it can be provided in a timely fashion, with an expert team outfitted with personal protective equipment (PPE). A fibrinolysis based strategy may be entertained at non PCI capable referral hospitals or in specific situations where primary PCI cannot be executed or is not deemed the best option^{12,13}. Similarly the European Association of Percutaneous Coronary Interventions also stresses upon primary PCI as the treatment of choice of acute STEMI patients with protective measures¹⁴. We at Rawalpindi Institute of Cardiology followed Pakistan Society of Interventional Cardiology guidelines which followed the Chinese guidelines in terms of managing stable STEMI cases with thrombolysis with streptokinase and doing intervention only among those patients not stabilizing with lysis¹⁵. This was the reason for the increase in the number of STEMI patients lysed with streptokinase in our study.

Similar trends are noticed among heart failure patients getting admitted with acute

decompensation as we saw a decline in 86.86% of acute decompensated heart failure admissions. Similar trends were observed in a study conducted by Bromage *et al*¹⁶ in which there was considerable decline in patients presenting with acute decompensated heart failure.

In addition to the reduced number of patients coming with cardiac emergencies worldwide, there was also delay in presentation seen further compounding the issues. In a study conducted by Vecchio *et al*¹⁷ a considerable delay in STEMI presentation was seen in the COVID era. It is interesting to note that such delayed presentations were seen among non-cardiac patients as well^{18,19}. Although in our study we did not assess the delay in emergency presentation of patients but that could be expected due to the COVID associated lockdown due to apprehension and fear among the common masses about the pandemic and also due to the suspended transport.

It is important to note that these ailments could potentially add to the COVID 19 associated deaths as most of these diseases in milder form could have been timely diagnosed and treated. Another important aspect in this regard was the patients with milder cardiac issues not coming for management could potentially present post COVID 19 with severe symptoms thus producing a burden on an already depleted health care system.

CONCLUSION

This study shows the dramatic decline in patient admissions with cardiac ailments in the emergency department of a tertiary care hospital highlighting the overall impact of morbidity and mortality secondary to the COVID 19 pandemic due to issues not directly related to COVID 19 and also gives us an eye opener to expect a high number of complicated cardiac patients coming to our hospital once the pandemic is over.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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