Study of respiratory disorders at a tertiary care hospital in Sri Lanka during lockdown

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Abstract: **COVID-19 is a rapidly spreading new viral infection causing an unprecedented global pandemic. Sudden lockdowns and curfews imposed throughout countries and continents have caused a significant impact on global health systems. As the scientific community focused its attention on the pandemic, the prevalence and patterns of other medical illness including respiratory illnesses went largely neglected. This study was designed to determine the pattern of respiratory disorders at Teaching Hospital Batticaloa, Sri Lanka during the lockdown period, specifically looking at the prevalence of age, gender, place of admission and pattern of respiratory disorders among admitted patients with respiratory conditions. It was a cross sectional descriptive study done retrospectively among all the patients with non-COVID related respiratory illnesses admitted to medical wards and intensive care units (ICU) of Teaching Hospital Batticaloa, Sri Lanka during a one month period of first lockdown (11.03.2020 to 10.04.2020) due to COVID-19. They were compared with the patients of respiratory illnesses admitted one month (11.02.2020 to 10.03.2020) prior to the lockdown. Our study revealed 215 admissions before the lockdown and 86 admissions during lockdown with respiratory diseases. Total number of admission before lockdown was 2340 and during the lockdown this number reduced to 1376. Age distribution demonstrated that the highest number of patients (about 25%) admitted with respiratory illnesses during both study periods was within the age of 61-70 years. Gender distribution confirmed that male admissions were higher before lockdown (58%) and female admissions were slightly higher during lockdown (51%). The study showed that inward admission was 212 and 78 before and during lockdown and ICU admission was 3 and 8 before and during lockdown respectively. Further analysis revealed ICU admissions had increased and ward admission has been reduced during lockdown. Most common respiratory disorders among admitted patients before and during lockdown were lower respiratory tract infections, exacerbation of chronic obstructive pulmonary disease (COPD) and exacerbation of asthma. Therefore these three diseases were analysed separately. It showed there was a significant reduction of these three cases during lock down. These findings were closely related to the available data from other countries. In conclusion, the number of admissions to the hospitals with respiratory disorders during COVID-19 lockdown was significantly reduced. Exacerbations of asthma and COPD and lower respiratory tract infections were the common disorders during lockdown even though there was less number of patients. More females within the age group of 61-70 years were admitted. Interestingly a higher number of admissions to the ICU were noted during lockdown. We assume that less exposure to allergens and triggering factors during lockdown and wearing face masks and practicing good healthy hygienic measures may contribute to the reduction in number. Moreover late presentation with more severe disease status may be contributing for higher ICU admissions. However, these assumptions and explanations need further studies to prove.**

***Keywords*: COVID-19, Before Lockdown, During Lockdown, Respiratory Disorders, Pandemic**

I. INTRODUCTION

COVID-19 is a rapidly spreading viral infection. It was first isolated in Wuhan, China in December 2019 from a patient with pneumonia. It is an RNA virus and is named as SARS-CoV-2 (Severe Acute Respiratory Syndrome Corona Virus-2). Soon the disease spread almost all parts of the world and became a pandemic. The disease mainly spreads from an infected person via respiratory droplets while coughing, sneezing, speaking, singing or even breathings [1]. Around 80% of infected people are asymptomatic or may develop mild to moderate respiratory illness. Severe form of disease affects mainly older people with underlying chronic diseases such as diabetes mellitus, chronic lung diseases, chronic kidney diseases and malignancies. It is estimated that about 1-3% may die eventually due to critical illness [2].

In Sri Lanka, the first COVID-19 infection was confirmed on 11th of March 2020. Up to 31st December 2021, the disease affected about 293 million people and caused 5.45 million deaths globally including 586746 confirmed cases and 14962 deaths in Sri Lanka [3].

Due to the rapid spread of this pandemic disease, curfews and lockdowns were imposed almost all over the world even in Sri Lanka. Moreover, the public was instructed to follow healthy hygienic measures such as wearing face mask, social distancing of at least one meter and frequent hand washing. The first lockdown was imposed in Sri Lanka for one month from 11.03.2020 to 10.04.2020 since confirmation of the first case of COVID-19 [3].

Furthermore, almost all the teaching hospitals in Sri Lanka together with Teaching Hospital Batticaloa, have been converted as treatment centres for this COVID-19. Unfortunately massive number of COVID-19 cases admitted to the health institutions daily on one hand and admitted patients with other medical problems including other common respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD) were reduced on other hand [4, 5, 6].

Objectives

The general objective of this study was to determine the pattern of respiratory disorders at Teaching Hospital Batticaloa, Sri Lanka during lockdown with the specific objectives to determine the prevalence of age, gender, place of admission and pattern of respiratory disorders among admitted patients with respiratory illnesses.

II. METHODOLOGY

It was a descriptive cross sectional study, done retrospectively among patients with respiratory disorders admitted to medical wards and intensive care units (ICU) of Teaching Hospital Batticaloa, Sri Lanka during first lockdown due to COVID-19. The patients were studied over a period of one month during the first lockdown from 11.03.2020 to 10.04.2020. They were compared with the patients of respiratory illnesses admitted one month prior to the lockdown that was from 11.02.2020 to 10.03.2020. All the patients with respiratory diseases admitted to the above mentioned units were incorporated into this research project during the study period. Ethical clearance obtained from ethical review committee of Faculty of Health-Care Sciences, Eastern University, Sri Lanka.

III. RESULTS

Total number of admitted patients before and during lockdown was 2340 and 1376 respectively (total was 3716 patients). Out of these, 215 patients were admitted before lockdown and 86 patients were admitted during lockdown with respiratory disorders (total was 301 patients). There was a significant difference in all respiratory diseases in the total admission before and during lock down ($\chi 2$ =10.048, df= 1, p=0.0072 at 95% CI). A post-hoc z-test on the adjusted residuals with Bonferroni correction revealed that both respiratory diseases and other diseases have been reduced significantly during lockdown.

Age distribution revealed that the highest number of patients admitted with respiratory illnesses were within the age of 61-70 years before (24%) and during (25%) lockdown. The proportion of patients was nearly same during both periods. Details of proportion of patients according to the age categories have been graphed in Figure-1.

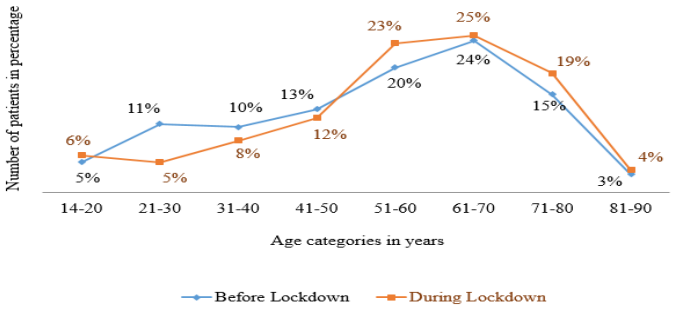

Figure-1: Age distribution (in years) of patients with respiratory illnesses before and during lockdown

Gender distribution demonstrated that male admission (58%) was higher before lockdown when compared to female admission (48%). During lockdown, female admission was slightly higher, that was 51% and male admission was 49%. This is shown in Figure-2.

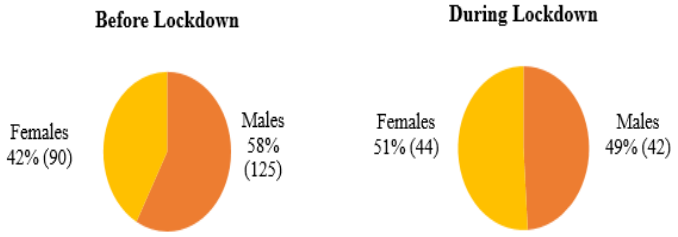

Figure-2: Gender distribution before and during lockdown

The study confirmed that most of the patients were admitted to the wards before and during lockdown with respiratory issues, 212 and 78 respectively. Moreover, Intensive Care Unit (ICU) admissions increased from 3 to 8 during lockdown. The details demonstrated in Figure-3.

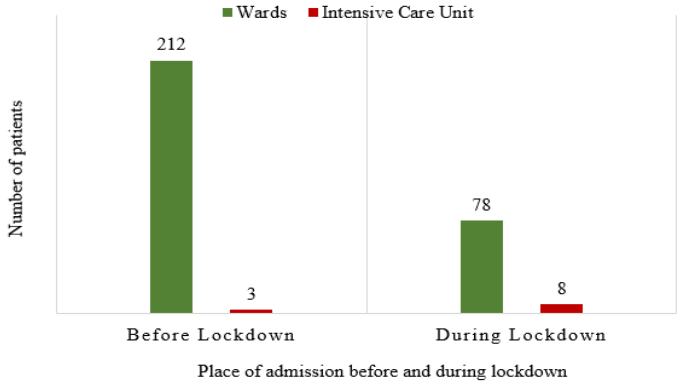

Figure-3: Distribution of place of admission before and during lockdown

However, there was a significant difference in place of admission with respiratory diseases before and during lock down ($\chi 2$ =10.908, df= 1, p=0.001 at 95% CI). A post-hoc z-test on the adjusted residuals with Bonferroni correction revealed that during lockdown, intensive care unit (ICU) admission has been increased significantly and ward admission has been reduced significantly (p<0.0125). The effect size indicate that this reduction is small (Cramer's V=0.190).

Most common respiratory disorders among admitted patients before and during lockdown were lower respiratory tract infections, exacerbation of chronic obstructive pulmonary disease (COPD) and exacerbation of asthma. Therefore these three diseases were analysed separately. It showed there was a significant difference in these three respiratory diseases before and during lock down ($\chi 2$ =12.784, df= 6, p=0.047 at 95% CI). A post-hoc z-test on the adjusted residuals with Bonferroni correction revealed that these three respiratory diseases have been reduced significantly during lockdown

($p<0.0036$). The effect size indicate that this reduction is small (Cramer's V=0.209). Please see table-1 for more details.

Respiratory Conditions	Number of Cases	
	Before Lockdown	During Lockdown
Bronchiectasis	13	6
Bronchitis	6	2
Exacerbation of Asthma	50	33
Exacerbation of COPD	45	17
Lower Respiratory Tract Infections	70	17
Pneumonia	3	4
Upper Respiratory Tract Infections	28	7
Total	215	86

Table-1: Distribution of respiratory disorders before and during lockdown

There was no significant difference in presentation of other respiratory illnesses such as bronchiectasis, bronchitis, pneumonia and upper respiratory tract infections.

IV. DISCUSSION

It was evident that the number of patients admitted with non-COVID related respiratory illnesses during lockdown were reduced almost all parts of the world. Especially the most common respiratory conditions like exacerbation of asthma, exacerbation of COPD and lower respiratory tract infections were significantly reduced in our study. Most importantly other similar studies also demonstrated similar results that fewer exacerbations of asthma and COPD during lockdown compared to before lockdown [4, 5, 6, 7]. We assume this reduction in number may be partially due to less exposure to allergens and triggering factors during lockdown and partially due to wearing face masks and practicing good healthy hygienic measures.

Few studies have evaluated gender, age and place of admission. Our study showed that the common age group admitted during lockdown was 61-70 years and predominately females. Similar results were demonstrated in a study done in Greece, which showed mean (±SD) age of 66.1 ± 16.6 years with 64.5% females [7].

There was no study published in the literature to see the place of admission during lockdown. Our study showed more patients admitted to ward before and during lockdown. However, there is significant raise in ICU admissions during lockdown. This may be due to more severe and late presentation to the hospital during lockdown. These assumptions and explanations need further studies to prove.

We believe this study may provide some idea about the number of cases, pattern of respiratory diseases and their demographic characteristics to the experts to plan about preparedness during similar pandemics in the future.

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V. CONCLUSION

Almost all parts of the world have experienced less number of admissions to the hospitals with Non-COVID respiratory disorders during this period. Exacerbations of asthma and COPD and lower respiratory tract infections are the common disorders during lockdown even though less number of patients. More females with age group of 61-70 years were admitted more than males and other age groups. Interestingly our study revealed significantly higher number of admissions to the ICU during lockdown.

We assume that less exposure to allergens and triggering factors during lockdown and wearing face masks and practicing good healthy hygienic measures may contribute to the reduction in number. Moreover late presentation with more severe disease condition may be contributing for higher ICU admissions. However, these assumptions and explanations need further studies to prove.

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