Original Article

Our experience of COVID-19 at a large district general hospital in the north west of England

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Author`s Contribution	A B S T R A C T
[1]Drafting the work or revising it critically for important intellectual content,Final approval of the version to be published [2-4]Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work. **Address of Correspondent** Dr. Ayaz Abbasi Consultant Emergency Medicine, Wrightington, Wigan and Leigh Teaching Hospitals NHS Foundation Trust aaabbasi38@hotmail.com	**Objective:** To determine the mortality rate, discharge rate, current admissions, and comorbid conditions in our patients along to further investigate high mortality rates observed at our hospital. **Methodology:** This retrospective epidemiological study aims to review patients presenting with COVID-19 at a District General Hospital in the north west of England. A total of 514 patients were admitted with a positive COVID-19 swab from March 17, 2020, to midnight May 20, 2020, have been included in this study. Patients discharged from the Emergency Department were excluded. The data was assessed daily by the Clinical Audit and Effectiveness Team and cross-referenced across multiple sources to ensure accuracy. **Results:** Out of the 514 patients, 284 (55%) were male while 230 (45%) were females (Figure 1). Among the 514 patients admitted, 236 (45.9%) died, 263 (51.2%) were discharged, 1 (0.2%) was discharged and then readmitted, 1 (0.2%) was transferred while 13 (2.5%) are still admitted at the hospital. Out of the 236 patients who died, 144 (61%) were male and 92 (39%) were female. 130 (49%) of the 263 patients discharged were male and 133 (51%) were female. One female patient was discharged but then readmitted and one male patient was transferred. Out of the 13 patients still admitted at the hospital, 9 (69%) are male and 4 (31%) are female (Fig 2). Upon review of the pre-existing comorbid conditions of the patients, it was noted that 101 (20%) patients had no comorbid conditions, 59 (11%) had one comorbid condition, 93 (18%) had two comorbid conditions, 106 (21%) had three and 155 (30%) had four or more comorbid conditions. **Conclusion**: Patients with comorbid conditions are more prone to COVID-19 in terms of severity. Due to high mortality rates observed in our study, we propose further research to review the high susceptibility to severe COVID-19 infection in the population of North West, England. **Keywords:** COVID 19, Mortality, Co morbidities.

Introduction

In December 2019 several cases of atypical pneumonia of an unknown cause reported in the city of Wuhan, China. The causative agent identified by Chinese scientists on January 7, 2020 was the SARS CoV2.[1.] This virus soon spread worldwide raising immense global concern. As the spread continued, WHO declared it a public health emergency of international concern (PHEIC) on January 30, 2020 and went on to declare a pandemic on March 11, 2020.[2] To date, the virus has infected 8,066,839 individuals and caused 437,296 deaths worldwide.[3] 41,736 deaths have been reported in the United Kingdom alone, making it one of the countries most affected by the SARS CoV2 pandemic. The virus spreads from person to person through respiratory droplets and via contact with

contaminated surfaces.[4] Fever, cough, dyspnea, myalgia are the most common symptoms while some patients may experience headache, diarrhea or may even remain relatively asymptomatic. However, high mortality has been observed in patients over 65 years with co morbid conditions such as diabetes, hypertension, cardiovascular disease, cancer, and other conditions that compromise the immune system.[5] Further analysis has shown that Black, Asian, and Minority Ethnic (BAME) individuals have a higher risk of adverse outcomes when infected with COVID-19, however, the factors contributing to this ethnic distribution are yet to be determined.[6] The aim of this retrospective cohort epidemiological study is to review our patients who were presenting with COVID19 from March 17, 2020 to May 20, 2020 to determine the outcomes in terms of mortality, discharge rate, current admissions, co morbidities and to further investigate the high mortality rate observed at our hospital.

Methodology

The data for this study has been derived from a Clinical Performance Management Tool set up by the IT team on the Hospital Information System (HIS) which identifies all patients with a positive COVID-19 swab. All patients admitted were included in the study while patients who were discharged home from the Emergency Department were excluded. All deaths including those that occurred in the A&E without ward admission were included. The data was assessed daily by the Clinical Audit and Effectiveness Team and cross-referenced across multiple sources to ensure accuracy. A total of 514 patients were admitted with a positive COVID-19 swab from March 17, 2020 to midnight May 20, 2020 and have been included in this study.

Results

A total of 514 patients were admitted with a positive COVID-19 swab. Out of the 514 patients, 284 (55%) were male while 230 (45%) were female (Figure 1).

Among the 514 patients admitted, 236 (45.9%) died, 263 (51.2%) were discharged, 1 (0.2%) was discharged and then readmitted, 1 (0.2%) was transferred while 13 (2.5%) are still admitted at the hospital. Out of the 236 patients who died, 144 (61%) were male and 92 (39%) were female. 130 (49%) of the 263 patients discharged were male and 133 (51%) were female. One female patient was discharged but then readmitted and one male patient was transferred. Out of the 13 patients still

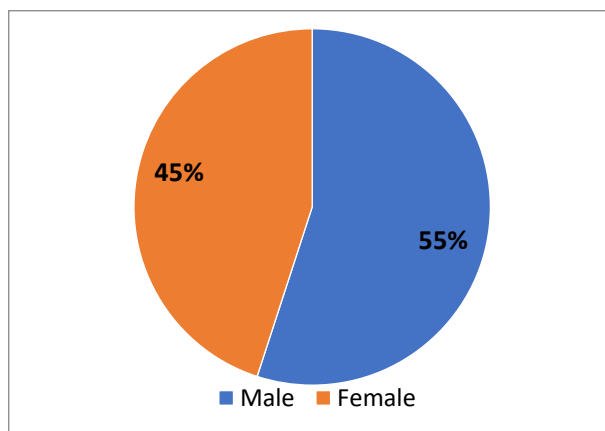admitted to the hospital, 9 (69%) are male and 4 (31%) are female (Figure 2).

Figure 1. Gender Distribution with a positive COVID 19 swab.
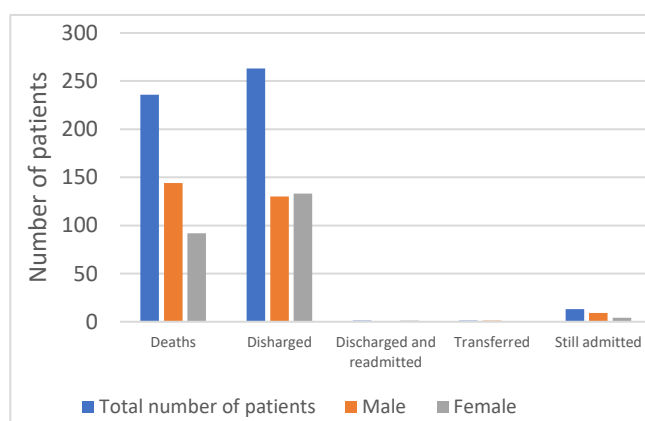

Figure 2. No of the patients admitted

Upon review of the pre-existing co morbid conditions of the patients, it was noted that 101 (20%) patients had no co morbid conditions, 59 (11%) had one co morbid condition, 93 (18%) had two co morbid conditions, 106 (21%) had three and 155 (30%) had four or more comorbid conditions (Figure 3).
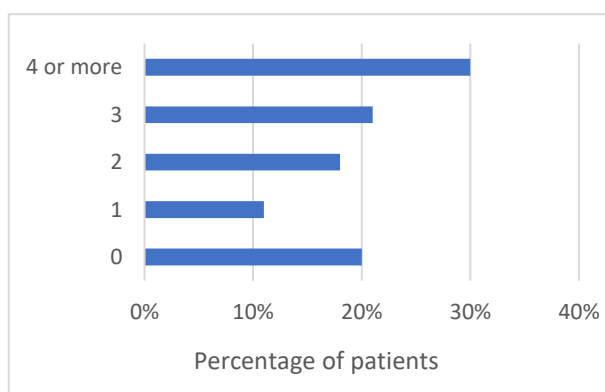

Figure 3. Number of co morbidities.

Out of the 514 patients, 136 (27%) had pulmonary conditions which included 70 (14%) patients with COPD, 46 (9%) with asthma, 11 (2%) with bronchiectasis, and 9 (2%) with other chronic pulmonary conditions. Amongst the 136 patients presenting with pulmonary conditions, mortality was reported in 66 patients (49%). Mortality was seen in 37 out of 70 (53%) of patients presenting with COPD, in 18 out 46 (39%) patient presenting with asthma, 5 out of 11 (46%) patients presenting with bronchiectasis, and in 6 out of 9 (67%) patients presenting with other pulmonary conditions.

391 patients presented with cardiac conditions. Mortality was reported in 214 (55%) of these patients. Out of 180 patients presenting with hypertension, mortality was seen in 90 (50%). Mortality in patients presenting with atrial fibrillation was 50/88 (57%), valvular heart diseases 6/10 (60%), heart failure 22/39 (56%) and ischemic heart disease/history of percutaneous intervention or coronary artery bypass graft 46/74 (62%).

In patients presenting with diabetes, mellitus mortality was seen in 57/114 (50%), in those presenting with chronic kidney disease 24/46 (52%) and with an active or previous history of cancer 24/44 (55%) (Table I).

Discussion

By the 20th of May we had 514 patients admitted with positive swabs for COVID-19. 45% of our patients died after testing positive with COVID-19. Most patients who died were male (55%) which is consistent with Shen N et al[7]. Male sex is a risk factor for infection, severe disease, disease progression, need for mechanical ventilation and increased mortality.[8] Further research is required to know the reason for this disparity between the male and female

sex. One hypothesis is that this may be due to the presence of androgens, or lower levels of SARs-Cov-2 antibodies.[9,10] In our study it is noticeably clear that patients with multiple co morbidities had higher mortality; the more co morbidities the higher the mortality. This is consistent with the findings of Alaa AM et al and Harrison EM et al.[11,12] People with co morbidities are at a higher risk of severe illness and mortality. Severe illness is directly proportional to the commodities of a person suffering from Covid-19. The diseases most commonly affecting Covid-19 patients are hypertension, cardiovascular disease, diabetes, and chronic respiratory diseases. In a prospective observational cohort study of more than 20,000 hospitalized patients in the UK [13], the most common comorbidities were chronic cardiac disease (31%), uncomplicated diabetes (21%) and non-asthmatic chronic pulmonary disease (18%). Similarly, in the US the most common comorbidities were cardiovascular disease (32%), diabetes (30%), and chronic lung disease (18%). Hospitalizations were six times higher and deaths were twelve times higher in patients with comorbidities compared with those without.[14]

In our study 76% of patients had cardiovascular diseases and 55% of patients with these diseases could not survive. Contrast to other studies in UK and USA where the percentage was consistent with only 31% as compared to our study which was 76%. Further research needs to investigate this disparity and reasons. We are aware that our hospital catchment area covers one of the worst socioeconomic populations in the UK. Similarly, chronic lung diseases were present in 29% of our patients while is US and other areas of UK it was consistent with 18%. Again, this is due to high prevalence of cigarette

Table 1: COVID 19 Mortality and comorbidities

	Total cases recorded	Percentage of attendances with condition	Total deaths with condition	Number of deaths as percentage of condition
Pulmonary	136	27 %	66	49 %
COPD	70	14 %	37	53 %
Asthma	46	9 %	18	39 %
Bronchiectasis	11	2 %	5	46 %
Otherchronic pulmonary conditions	9	2 %	6	67 %
Cardiac	391	76 %	214	55 %
Hypertension	180	35 %	90	50 %
AF	88	17 %	50	57 %
Valvular disease	10	2 %	6	60 %
Heart failure	39	8 %	22	56 %
IHD/PCI/CABG	74	14 %	46	62 %
Others				
Diabetes	114	22 %	57	50 %
CKD	46	9 %	24	52 %
Cancer	44	9 %	24	55 %

smokers causing chronic pulmonary disease. The percentage of diabetic patients in our study (22%) were consistent with findings with other researchers Wang L et al[15] (22%) but fifty percent of our patients with diabetes could not survive COVID-19. In our study only 9% patients had kidney disease in contrast to study by Lusignan S et al [16] where 16% of their patients were suffering from kidneys diseases, but 52% of these patients died in hospital. Cancer patients admitted with COVID-19 were only 9% but mortality in this group of patients was 55%. We know from the study Ofori-Asenso R et al [17] that people with cancer are at high risk of infection with COVID 19, likely due to immunosuppressant and due to frequent hospital visits. Patients with cancer are 76% more likely to get a severe disease compared with those without cancer. 45% of our patients admitted sadly died which is an extremely high mortality.

To prevent this high mortality, we need in depth analysis and further research in our region to prevent especially when we are expecting the second wave in the coming winter.

Conclusion

We conclude from our study that patients having co morbid conditions are prone to developing a severe spectrum of COVID-19 infection. The male gender is more likely to get infected with COVID-19 along with higher mortality rate. Due to high mortality in our study we propose further research to determine the increased susceptibility of the population in the North West of England, to a more severe form of COVID-19.

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