Short Report
Exploring Ethnicity in Hospital Patients with COVID-19 in South London

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Abstract

Ethnicity was found to be an independent risk factor in COVID-19 outcomes in the UK and USA during the pandemic surge. London, being in the epicentre and having one of the most ethnically diverse population in the UK, was likely to have experienced a much higher intensity of this phenomenon. Black Asian and Minority ethnic groups were more likely to be admitted, more likely to require admission to intensive care and more likely to die from COVID-19. We undertook an analysis of a case series to explore the impact of ethnicity in hospitalised patients with confirmed COVID-19 during the 3 months of the pandemic. Our results demonstrated that although the proportion of Asian and Black patients were representative of the local population distribution, they were much younger. The prevalence of comorbidities was similar but logistic regression analysis showed that male sex (OR 1.4, 95% CI 1.1-1.9; p=0.02), age (OR 1.03, 95% CI 1.02 - 1.04, p<0.001), those in the 'Other' [Odds ratio 1.7 (1.1-2.6) p = 0.01] and 'Asian'[Odds ratio 1.8 (1.1-2.7) p=0.01], category were at higher risk of death in this cohort. Our results, therefore, are consistent with the overall data from the UK and USA indicating that ethnicity remains a significant additional risk and hence our clinical services must ensure that adequate provision is made to cater for this risk and research must be designed to understand the causes.

Keywords
COVID-19; mortality; ethnicity; health inequalities

Background

At the beginning of the COVID-19 pandemic in China, predictors of worse disease related outcomes were male sex, advanced age and cardiovascular comorbidities. However, the global progression of the SARS-CoV-2 virus resulted in emerging data on the impact of ethnicity across the United Kingdom (UK) and United States of America (1) . During the surge in UK cases, local centres saw a high incidence of intensive care unit (ITU) admissions and mortality rates in Black, Asian and Minority (BAME) ethnic backgrounds; this identified a need for further research (1, 2) . A comprehensive analaysis of National Health Service (NHS) Digital databases which included approximately 80,000 patients, showed that individuals from a BAME background were more likely to be diagnosed with COVID-19, more likely to be admitted to hospital and intensive care, and more likely to die in comparison to general population (3) . BAME background emerged as an independent risk factor for the pandemic, in particularly South Asian ethnicity (2, 4). Although BAME patients affected by COVID-19 were younger and with significantly lower median ages (Asian 51, Mixed/Other 57, Black 57 years old) than white patients (69 years old), the total burden of comorbidities was similar across all ethnicities. Additionally, respiratory diseases were

more prevalent in White patients whilst cardiovascular and endocrine diseases were more prevalent in BAME patients. Increased prevalence of COVID-19 amongst individuals from a BAME background may be explained by the geographical distribution of the virus in the UK, in addition to deprivation and occupational exposure. The UK is a country with a large ethnically diverse population, and analysis can therefore contribute to our understanding of the disease's effects in various ethnic groups; the ethnic minority population of the UK was around 13% at the time of the last census in 2011 (5) . Greater London and the South East have the highest number of people who were born outside of the UK, out of which almost a third speak a language other than English as their first language. Furthermore, London's ethnically diverse population includes 18.5% Asian, 13.3% Black, 5% Mixed, 3.4% Other and 44.9% White ethnic groups (6) . Thus, the impact of ethnicity on COVID-19 outcomes in Greater London is likely to be more apparent than the UK as a whole. Being at the epicentre of the pandemic in the UK, our Hospital experienced the early surge of patients affected by COVID-19 with a total number of 855 cases between March and May. This report aims to explore the impact of ethnicity on COVID-19 outcomes in order to improve current clinical practice.

Aim

To explore the relationship between ethnicity and health related outcomes in patients with COVID-19.

Design & Methods

A retrospective review of patient case notes of those with a polymerase chain reaction (PCR) confirmed SARS-CoV-2 infection, diagnosed March-May 2020 in St George's Hospital, London. The data collection was registered as an institutional audit (registration number: 10051). Patients were included if they were admitted overnight. Exclusion criteria were age below 16 years old and being employed by our Trust. Data collection included: demographics, ethnicity, length of stay, history of co-morbidities. The primary outcome was death or discharge.

Ethnicity was defined as per UK census definition and from NHS records as 0 = not known, 1 = Asian, 2 = Black, 3= Mixed, 4 = Other ethnicity and 5 = White. Age on admission was classified into categories; 1= <40 years, 2 = 40-49, 3 = 50-59, 4 = 60-69 and 5

= >70 years. The data were collected from hospital electronic records, anonymised and analysed using SPSS statistical software (SPSS v26, IBM Inc, USA). Data analysis included descriptive statistics and binary logistic regression modelling.

Results

Data collection identified confirmed 1966 SARS-CoV-2 cases between March and May 2020. Inclusion and exclusion criteria were applied, narrowing this to 1016 cases. 161 patients were admitted more than once, thus the final data analysis included 855 patients.

This cohort consisted of 470 (55%) men and 385 (45%) women. 419 (49%) patients were from Asian, Black, Mixed and Other backgrounds, whilst 513 (59.8%) were white. For 141 (16.4%) patients ethnicity was unknown (table 1). The mean age of male patients in our sample was 67.1 (SD=16.4) years whilst the mean age of women was 67.7 (SD=18.8) years. Figure 1 shows the distribution of age in each of the ethnic groups with Asian (mean 60.8, SD 17.8 years for men and mean 61.9, SD 19.8 years for women) and Black women (mean 63.8, SD 19.1 years) being younger in this cohort compared to White ethnic group (mean 70.1, SD 15.5 years for men and mean 71.2, SD 18.2 years for women). In total, 295 patients died whilst 560 survived to discharge (figure 3). The length of stay in hospital was 12.2 (SD =11.3) days for men and 11.9 (SD =10.9) days for women (table1). Figure 2 shows the proportion of patients in each age group with co-morbidities. There was a rising trend for the presence of comorbidities with increasing age band. Binary logistic regression analysis showed that male sex (OR 1.4, 95% CI 1.1-1.9; p=0.02), age (OR 1.03, 95% CI 1.02 - 1.04, p<0.001), those in the 'Other' [Odds ratio 1.7 (1.1-2.6) p = 0.01] and 'Asian'[Odds ratio 1.8 (1.1-2.7) p=0.01], category were independent predictors of death in this cohort.

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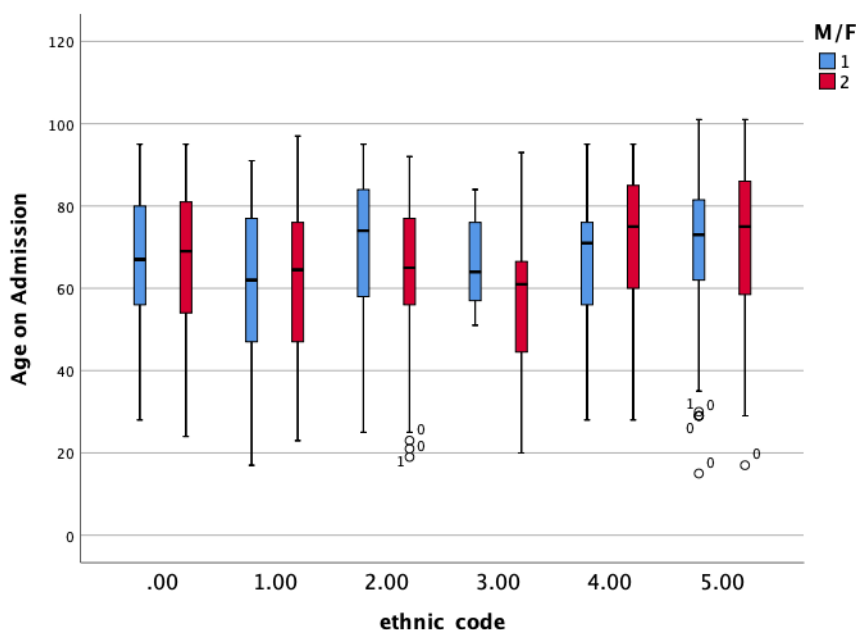
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Table 1: hows the proportions in each ethnic group for gender, comorbidities and death/

Category	Ethnic- not known (%)	Ethnic -Asian	Ethnic – Black	Ethnic – Mixed	Ethnic – Other	Ethnic- White
London population	na	18.5	13.3	5	3.4	59.8
Proportion (%)	16.4	16.4	14.1	2.2	16.4	34.2
Men (%)	60	60.5	48.2	50	56.3	51.9
Age (SD) years	66.7 (16.7)	61.2 (18.5)	67.1 (17.9)	62 (18.7)	68.5 (16.6)	70.7 (16.8)
LoS (SD) days	13.2 (11.9)	10.6 (10.9)	12.9 (12.3)	8.6 (7.6)	12.9 (11.3)	11.8 (10.4)
Comorbidities (%)	51.8	50	68.6	73.3	61.6	53.4
Death (%)	33.7	31.1	29.6	36.4	31.3	24.6
OR for death	1.7 (1.1-2.6)	1.8 (1.1-2.7)	NS	NS	NS	NS

Figure 1: Box plots showing distribution of age in each ethnic group by gender.

Age groups; 0 = <40, 1 = 40-49, 2 = 50-59, 3 = 60-69 and 4 = >70 years

Discussion

Analysis of data from the UK has demonstrated that ethnicity is an independent risk factor for poor outcomes in patients with COVID-19 (1) . The causes are likely to be multi-factorial. London has a higher proportion of ethnic diversity in the local population, thus we conducted this analysis to explore the proportions of each ethnic group represented among the patients admitted to hospital during the COVID-19 surge in the UK.

Our results show that Black and Asian ethnic groups admitted to the hospital with COVID-19 were represented proportionally in relation to local population. In contrast, white patients were under-represented indicating that out of the local population groups, fewer patients from white backgrounds had a diagnosis of COVID-19. Our catchment area has a widely variable population demographic, age distribution, ethnic diversity and social deprivation. Representation of Black ethnic groups vary from 25.9% in Lambeth to 4.9% in Sutton, while the Asian ethnic groups make up 6.9% of the Lambeth population and 16.3% in Kingston. Hence, for the comparison we have used the Greater

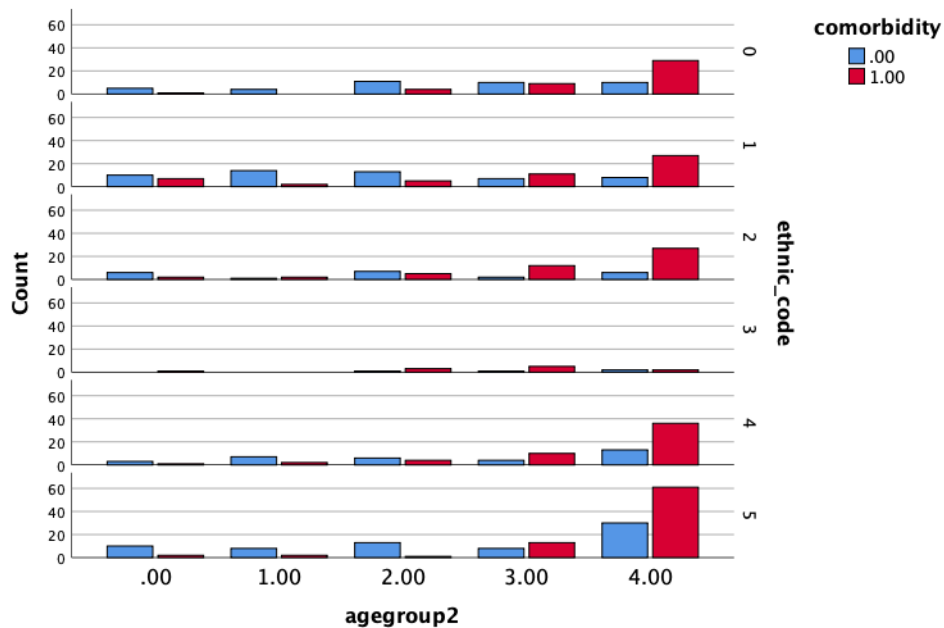Figure 2: Bar chart depicting the proportions of patients with comorbidities in each age-group
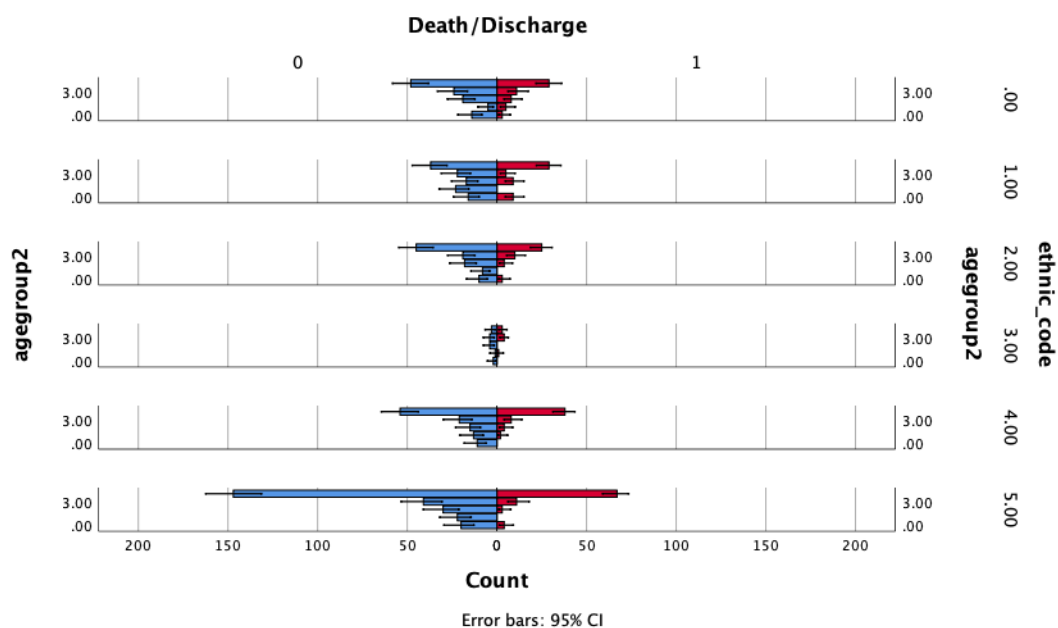

Figure 3: Figure 3 indicates the proportion of patients who died or were discharged in each ethnic group based on their age-group.

London population estimates. (6) However, these results mirror those reported by the analysis of UK NHS digital and ITU data. Patients from BAME backgrounds appear to have a higher rate of hospital admissions, severe disease and death.

Our logistic regression indicates that male sex, age and Asian ethnicity is associated with a higher risk of death from COVID-19. The other key finding is the age distribution, where Asian men and Black women were significantly younger than other groups.

This analysis is limited to patients admitted to hospital, rather than in the whole population. The majority of the COVID-19 cases were community based and did not require testing or hospital stay between March-June, and therefore our report includes patients with higher disease burden. The group of patients classified as 'other-not known' is also a sizeable cohort and seem to sit in the middle of the risk profile. Further exploration of this group and reclassification would help to strengthen our conclusions.

This analysis does not explore the potential causes of the deaths seen in this cohort of patients. UK and international data shows that genetic predisposition, cardiovascular comorbidities as well as socio-economic and racial disparities are likely to play a role (7) . The COVID-19 pandemic certainly has highlighted the need for increased awareness of the impact of ethnicity on disease, and has highlighted that there remains significant inequalities within the NHS, an organisation where care is aspired to be universal. It is the responsibility of all individuals and organisations within and outside of the NHS to be cognisant of this disparity, and to monitor and adopt measures that will help to balance this injustice.

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