



Clinical Outcomes of COVID-19 Patients of Different Ethnic Groups in Rural Populations

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Introduction

- COVID-19 has had a devastating impact all over the world¹. However, this impact has affected certain vulnerable populations more greatly
- In the United States, there is a higher susceptibility for COVID-19 in rural counties²
- Overall, more affluent counties tend to have better health outcomes than less affluent counties which becomes apparent with Covid-19 and its higher susceptibility in rural areas³
- Past research data has identified factors such as older age, hypertension, elevated cytokine levels, hyperglycemia, and elevated lactose dehydrogenase (LDH) levels with worse COVID-19 outcomes¹
- Additionally, a review of identified hotspots suggest that the incidence of COVID-19 shows intense disparities by ethnicity with current trends showing the following ethnicities as disproportionately affected in decreasing order: Hispanic/Latino persons, African American, American Indian/Alaska Native, Asian Persons and Native Hawaiian/other Pacific Islander⁴

Objective

This retrospective study investigates predicting factors for disparities related to COVID-19 disease severity between ethnic groups in one rural site in Arizona, USA

Methods

- COVID-19 positive patients from Kingman Regional Medical Center (KRMCM) were included in this study
- Laboratory values, comorbidities and clinical symptoms were collected from electronic medical records for selected COVID-19 positive patients in the year 2020
- Statistics were computed with SPSS statistics
- Categorical variables were assessed with chi-squared analysis and continuous variables with the Mann-Whitney test to evaluate trends related to outcome severity by ethnicity

Results

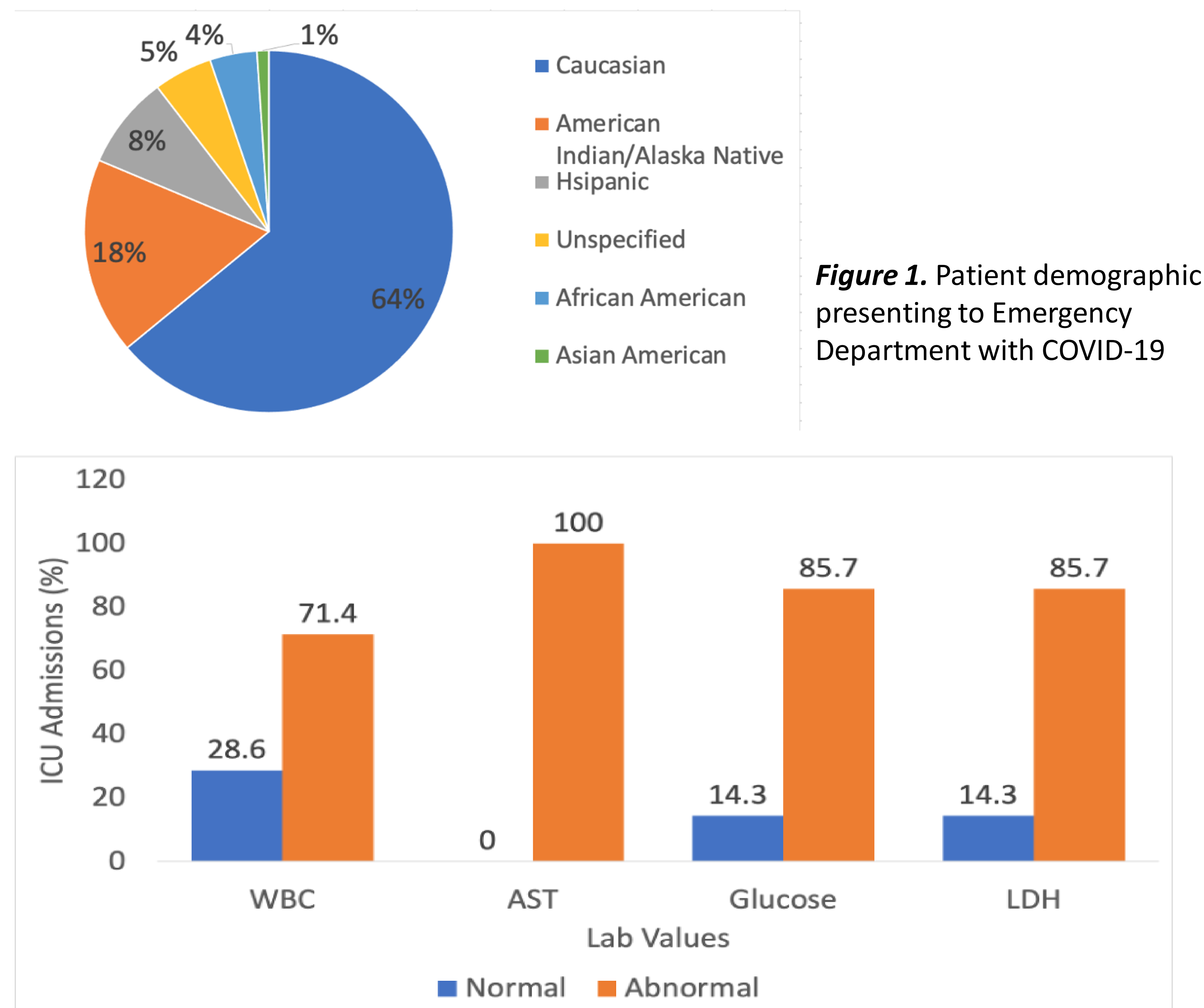


Figure 1. Patient demographic presenting to Emergency Department with COVID-19

Figure 2. Associations between patient lab values and ICU admissions. WBC and AST are significantly associated with ICU admissions (P = 0.035 and 0.002 respectively) while glucose and LDH levels were not significantly associated with ICU admissions.

	Minorities	Majority
Abnormal Lab Values		
WBC	52%*	25.6%
<4.0x10 ³ /uL or >10.8x10 ³ /uL		
AST	43.5%	44.2%
>36U/L		
LDH	92.3%*	41.2%
>34U/L		
Glucose	75%	58.1%
>106 mg/dL		
Measures		
ICU Admissions	24%*	2%
Mortality	24%*	6%

Table 1. Minorities had significantly abnormal WBC (P = 0.028), LDH (P = 0.004) values than their white counterparts. Minorities also had higher ICU admissions (P = 0.002), and mortality (P = 0.026) than their white counterparts. Minorities defined as American Indian/Alaska Native, Hispanic, African American, Asian American, Hispanic, and unspecified. Majority defined as White.

Results

- Of the 74 patients presenting to the Emergency Department with COVID-19, 62% were Caucasian, 17% American Indian/Alaska Native, 8% Hispanic, 5% Unspecified, 4% African American, and 1% Asian American
- Minorities had significantly higher abnormal white blood cell (WBC) counts, were more likely to have abnormal LDH levels, to be admitted to the ICU, and to die than their White counterparts
- Abnormal WBC and aspartate amino transferase (AST) levels were significantly associated with ICU admissions
- Glucose and LDH levels were not significantly associated with ICU admissions

Conclusion

- There was a correlation between minority status and more severe COVID-19 outcomes in one rural site in Arizona
- Minority patients were found to be more likely to have abnormal LDH levels and be admitted to the ICU
- Furthermore, abnormal lab values for white blood cell count and aspartate aminotransferase was found to be associated with ICU admissions
- These findings further emphasize the disparities that exist between majority and minority populations and thus indicate a need for further analysis to build a comprehensive profile to help equalize the treatment and care of all patients.
- A limitation of this study is the small sample size. Further analysis may be needed

References

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