Low Rates Of COVID-19 in a Vulnerable Population: Learning from Early and Decisive Public Health Policies

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BACKGROUND

Disasters, including pandemics, disproportionately affect vulnerable populations. The Downtown Eastside (DTES) neighborhood of Vancouver has high prevalence of mental illness, substance use, infectious disease and homelessness. While studies have described clinical characteristics of COVID-19 patients in other centres worldwide, data is lacking on marginalized groups. We describe the clinical characteristics and outcomes of COVID-19 patients seen at two urban hospitals who care for the vulnerable population in the DTES of Vancouver, British Columbia (BC), Canada.

METHODS

- A retrospective chart review was conducted on all COVID-19 patients ≥19 years seen at either centre from January 1 to June 10, 2020.
- Descriptive statistics assessed demographics, comorbidities, presenting symptoms, laboratory values and outcomes, and were compared between subjects managed as inpatients (died vs. discharged) and outpatients.

RESULTS

Table 1. Sociodemographics and Disease Specific Characteristics

	All (N=71)	Admitted (N=34)	Not Admitted (N=37)	P-value
Age, years, mean (SD)	57 (20)	69 (17)	46 (16)	**<0.001**
Gender, male, n (%)	36 (50.7)	21 (61.8)	15 (40.5)	0.10
Number of Comorbidities, mean (SD)	2 (2)	3 (3)	1 (2)	**<0.001**
Origin from type of residence, n (%)				
Community	58 (81.7)	24 (70.6)	34 (91.9)	**0.02**
Long term care/rehab facilities	3 (4.2)	3 (8.8)	0 (0)	0.06
NFA/DTES	8 (11.3)	2 (5.9)	0 (0)	0.13
# of days from symptom onset to presentation, mean (SD)	6.2 (5.9)	5.9 (4.3)	6.5 (7.3)	0.66
Presenting symptoms, n (%)				
Fever	40 (56.3)	22 (64.7)	18 (48.6)	0.17
Cough	42 (59.2)	20 (58.8)	22 (59.5)	0.96
Dyspnea	33 (46.5)	9 (26.5)	15 (40.5)	0.21
Myalgias	19 (26.8)	18 (52.9)	10 (27.0)	**0.03**
Loss of appetite/anorexia	18 (25.4)	17 (50.0)	1 (2.7)	**<0.001**
Exposure history, n (%)				
High risk environment (hospital, LTC, shelter)	24 (33.8)	9 (26.5)	15 (45.9)	0.21
Vocational risk	20 (28.2)	0 (0)	20 (54.1)	**<0.001**
Healthcare worker, n (%)	20 (28.2)	0 (0)	20 (54.1)	**<0.001**
-Healthcare worker with direct patient contact, n (%)	17 (23.9)	0 (0)	17 (45.9)	**<0.001**
Contact with COVID+ individual	15 (21.1)	8 (23.5)	7 (18.9)	0.63
No known exposure	22 (31.0)	13 (38.2)	9 (24.3)	0.20
Other/unknown	13 (18.3)	7 (20.6)	6 (16.2)	0.63
Comorbid Conditions, n (%)				
Hypertension, n (%)	26 (36.6)	16 (47.1)	10 (27.0)	0.08
Coronary Artery Disease, n (%)	6 (8.5)	5 (15.6)	1 (2.7)	0.07
Type 2 Diabetes, n (%)	9 (12.7)	7 (21.9)	1 (2.7)	**0.02**
COPD*, n (%)	2 (2.8)	2 (6.3)	0 (0)	0.13
CKD *(all stages), n (%)	4 (5.6)	4 (12.5)	0 (0)	**0.03**
Immunosuppressed, n (%)	4 (5.6)	3 (9.4)	1 (2.7)	0.26
Medications, n (%)				
ACE Inhibitors*, n (%)	11 (15.5)	9 (26.5)	2 (5.4)	**0.02**
ARBs*, n (%)	4 (5.6)	2 (5.9)	2 (5.4)	1.00
NSAIDs, n (%)	5 (7.0)	5 (14.7)	0 (0)	**0.02**
Anticoagulation, n (%)	5 (7.0)	4 (11.8)	1 (2.7)	0.18

*NFA-No fixed address; DTES=Downtown East side; COPD = chronic obstructive pulmonary disorder, CKD = chronic kidney disease, Immunosuppressed = HIV positive or on immunosuppressive medications, ACE inhibitors = angiotensin-converting enzyme inhibitor, ARBs = angiotensin II receptor blocker

Table 2. Outcomes of Admitted Subjects

Length of inpatient stay in days, median (IQR)	6.9 (4.0, 12.5)
Transferred to ICU, n (%)	10 (29.4)
ICU subjects survived to discharge, n (%	5 (50%)
Length of ICU stay if transferred in days, median (IQR)	11 (3.5, 20.3)
End Organ Damage, n (%)	
ARDS	10 (29.4)
Renal Dysfunction	6 (17.6)
Cardiac Dysfunction	5 (14.7)
Liver Dysfunction	3 (8.8)
Secondary Infection	7 (20.6)
DVT or PE	2 (5.9)
Discharged, n (%)	26 (76.4)
Death, n (%)	8 (23.5)

ARDS = acute respiratory distress syndrome as documented in the chart; renal dysfunction: AKI as documented in chart, Cr rise > 1.5x baseline or rise in absolute Cr of 26.5 umol/L over 48 hours; Cardiac dysfunction: objective EF documented on echo, new arrhythmia, or new ACS noted in chart; liver dysfunction: transaminase 3x upper limit of normal or liver failure noted in chart; DVT = deep vein thrombosis; PE = pulmonary embolism

Patient demographics of 8 subjects with NFA or from DTES:

- Age: mean 46 years (±SD 13)
- Admitted: 5 (63%)
- Male gender: 4 (50%)
- Mortality rate: 0

DISCUSSION

- Only 11% of subjects had NFA/DTES residence despite comprising 25% of patient hospital days
- In the first wave of the pandemic, health care workers comprised 28% of subjects; with risk related to direct patient care. Fortunately, none required hospital admission

CONCLUSIONS

- Our results concur with other studies showing older age, comorbidities, and some medications are associated with more severe COVID-19 disease.
- Those with NFA/DTES residence were under-represented among subjects at our centre
- Given that there is no financial barrier to access healthcare in Canada and these hospitals serve our most vulnerable populations, our results may indicate that BC Public Health has done an effective job of tracking and limiting community spread of COVID-19 during the initial wave of COVID-19 in Vancouver