411. Significance of a Known Epidemiological Link to a COVID-19 Index Case and Severity of COVID-19 Infection

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Toronto Invasive Bacterial Diseases Network

Session: P-18. COVID-19 Impact of Social Distancing/Mitigation Measures

Background. Several factors have been associated with severity of COVID-19 disease, but there remains a paucity of data surrounding whether the nature of exposure is impactful. Evidence demonstrating the correlation between initial viral exposure dose and disease severity exists for many viral infections. Observational studies have suggested that the exposure context, which can be considered a proxy for magnitude of viral inoculum, may influence severity of COVID-19 infection. We aimed to assess whether having a known exposure, as a proxy for higher inoculum dose to COVID-19, was associated with more severe outcomes for individuals hospitalized with COVID-19.

Methods. We created a retrospective cohort of community-dwelling adults hospitalized for COVID-19 in south-central Ontario from April 1, 2020 - January 14, 2021. Individuals or next of kin were contacted to ascertain exposure history. The primary outcome was death, intensive care unit (ICU) admission, or mechanical ventilation (MV) within 30 days of admission. A multivariable logistic regression model was used to determine whether a known exposure was associated with worse outcomes.

Results. 1097 individuals with community acquired COVID-19 required hospitalization; of these, 942 (86%) had available exposure data. In this group, the median age was 65, 44% were women, 84% lived in a private residence, 59% had a frailty score (FS) of 1 – 3 while 40% had a FS of 4 – 9, and 28% had a known exposure. Overall, the primary outcome occurred in 368/942 (39%) patients. Having a known exposure was not associated with worse outcome (OR 1.14, 95% CI 0.84–1.54, p = 0.41). Male gender (OR 1.41, 95% CI 1.06–1.89; p = 0.018), age (OR 1.01/year, 95% CI 1.00–1.03, p = 0.03), frailty (OR 1.22/point, 95% CI 1.09–1.36, p = 0.001) and living with at least one other person (OR 1.57, 95% CI 1.09–2.28, p = 0.017) were all associated with death, ICU admission, or MV within 30 days of admission.

Conclusion. While having a known exposure to a person with COVID-19 was not associated with worse outcome, the identified increased severity of illness associated with cohabitation suggests context of exposure may have a role in disease severity. This data and future studies can be used to guide public health recommendations to not only minimize transmission, but severity of COVID-19 infection.

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412. Estimating the Impact of School Classroom Sizes on the Probability of Severe Acute Respiratory Syndrome Coronavirus-2 Infectivity or Exposure

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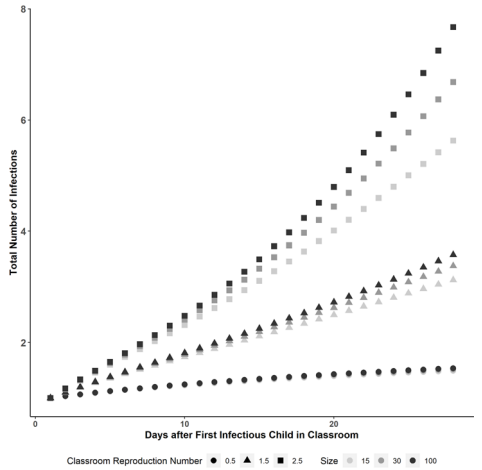
Session: P-18. COVID-19 Impact of Social Distancing/Mitigation Measures

Background. Despite schools reopening across the United States in communities with low and high Coronavirus disease 2019 (COVID-19) prevalence, data remain scarce about the effect of classroom size on the transmission of severe acute respiratory syndrome coronavirus-2 (SARS-COV-2) within schools. This study estimates the effect of classroom size on the risk of COVID-19 infection in a closed classroom cohort for varying age groups locally in Durham, North Carolina.

Total number of Coronavirus Disease 2019 (COVID-19) infections over a 28-day follow-up period for varying classroom reproduction number (R0) and varying classroom cohort sizes of 15 students, 30 students and 100 students in Durham County, North Carolina.



Methods. Using publicly available population and COVID-19 case count data from Durham County, we calculated a weekly average number of new confirmed COVID-19 cases per week between May 3, 2020 and August 22, 2020 according to age categories: < 5 years, 5-9 years, 10-14 years, and 15-19 years. We collated average classroom cohort sizes and enrollment data for each age group by grade level of education for the first month of the 2019-2020 academic school year. Then, using a SEIR compartmental model, we calculated the number of susceptible (S), exposed (E), infectious (I) and recovered (R) students in a cohort size of 15, 30 and 100 students, modelling for classroom reproduction number (R_0) of 0.5, 1.5 and 2.5 within a closed classroom cohort over a 14-day and 28-day follow-up period using age group-specific COVID-19 prevalence rates.

Results. The SEIR model estimated that the increase in cohort size resulted in up to 5 new COVID-19 infections per 10,000 students whereas the classroom R_0 had a stronger effect, with up to 88 new infections per 10,000 students in a closed classroom cohort over time. When comparing different follow-up periods in a closed cohort with R_0 of 0.5, we estimated 12 more infected students per 10,000 students over 28 days as compared to 14 days irrespective of cohort size. With a R_0 of 2.5, there were 49 more infected students per 10,000 students over 28 days as compared to 14 days.

Conclusion. Classroom R_0 had a stronger impact in reducing school-based COVID-19 transmission events as compared to cohort size. Additionally, earlier isolation of newly infected students in a closed cohort resulted in fewer new COVID-19 infections within that group. Mitigation strategies should target promoting safe practices within the school setting including early quarantine of newly identified contacts and minimizing COVID-19 community prevalence.

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414. Observed Time Burden with Nursing Practices in an Emergency Room COVID-19 Isolation Zone at a University Affiliated Hospital in Korea

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Session: P-19. COVID-19 Infection Prevention

Background. The coronavirus disease 2019 (COVID-19) has caused great burdens on emergency room (ER) and front-line ER healthcare personnel faced with great challenges, including threats to their safety. This study aimed to provide a basis for additional workload of ER nurses who are charged with providing care for COVID-19 confirmed or suspicious cases.

Table 1. Summary of Frequency and Time Burden with Nursing Practices in an Emergency Room COVID-19 Isolation Zone. Note. IV, intravenous; IM, intramuscular; ID, intradermal; SC, subcutaneous; PPE, personal protective equipment; CPR, cardiopulmonary resuscitation

Main category	Subcategory	Frequency	Total secconds (hours)	Seconds per practice
Nursing management		1825	166,660 (46.29)	
	Check doctor's prescription	834	72,499 (20.14)	86.93
	Nursing records	657	50,832 (14.12)	77.37
	Reimbursement coding	142	3,188 (0.89)	22.45
	Patient handover	123	36,452(10.13)	296.36
	Processing admission & discharge	52	2,173 (0.60)	41.79
	Patient transfer	17	1,516 (0.42)	89.18
Assessment & Observation		727	50,744 (14.10)	
	Managing monitor alarms	302	23,809 (6.61)	78.84
	Vital signs monitoring	162	8,865 (2.46)	54.72
	Consciousness assessment	142	8,908 (2.47)	62.73
	Discomfort assessment	41	3,846 (1.07)	93.8
	Check blood sugar	40	3,821 (1.06)	95.53
	Check intake and output	40	1,495 (0.42)	37.38
Medication		680	43,709 (12.14)	
	Medication preparation	377	33,210 (9.23)	88.09
	IV drip rate control	260	8,470 (2.35)	32.58
	IM, ID, & SC	23	1,183 (0.33)	51.43
	Oral medication	20	846 (0.24)	42.3
Infection control		2225	17,906 (4.97)	
	PPE	1499	12,810 (3.56)	8.55
	Hand hygiene	596	4,188 (1.16)	7.03
	Isolation zone access control	94	607 (0.17)	6.46
	Environmental disinfection	36	301 (0.08)	8.36
Education		287	20,615 (5.73)	
	Patient/guardian response	146	11,319 (3.14)	77.53
	Admission education	73	5,846 (1.62)	80.08
	Explanation of treatment process	37	1,158 (0.32)	31.3
	Discharge education	26	2,130 (0.59)	81.92
	Medication education	5	162 (0.05)	32.4
Pre/post examination care	Receiving consents & check side-effects	319	11,139 (3.09)	34.92
Communication		269	9,770 (2.71)	
	Call bell response	92	1,361 (0.38)	14.79
	Contact technicians	84	2,283 (0.63)	27.18
	Nursing assistant call	37	1,344 (0.37)	36.32
	Contact other departments	28	3,055 (0.85)	109.11
	Contact examination room	28	1,727 (0.48)	61.68
Excretion care		92	4,802 (1.33)	
	Foley catheter care	42	1,000 (0.28)	23.81
	Tapping care	14	544 (0.15)	38.86
	Excretion observation	13	508 (0.14)	39.08
	Tube dressing	10	1,747 (0.49)	174.7
	Levin tube care	6	506 (0.14)	84.33
	Chest tube care	5	466 (0.13)	93.2
	Simple dressing	2	31 (0.01)	15.5
Respiratory care		69	8,156 (2.27)	118.2
	Suction	30	4,608 (1.28)	153.6
	Ventilator operation	23	3,030 (0.84)	131.74
	Oxygen therapy	15	486 (0.14)	32.4
	Nebulizer	1	32 (0.01)	32
Safety		72	5,548 (1.54)	
	Transfusion	71	5,527 (1.54)	77.85
	Fall prevention	1	21 (0.01)	21
Others		2	199 (0.06)	
	Tube feeding	1	169 (0.05)	169
	CPR	1	30 (0.01)	30
Total		6,567	337,703 (93.81)	

Note. IV, intravenous; IM, intramuscular; ID, intradermal; SC, subcutaneous; PPE, personal protective equipment; CPR, cardiopulmonary resuscitation