Long COVID prevalence from Omicron BA.1/1.1: national cohort study of Canadian adults

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Introduction

Post-COVID condition (PCC) or long COVID has been identified as a serious consequence of SARS-CoV-2 infection,[1] but little is known about its incidence, risk factors, and association with seropositive infection among the general Canadian population.

Objective

We examined the relationship between SARS-CoV-2 serology, viral test history, and post-COVID condition (hereafter as long COVID) symptoms, and derived age- and sex-specific estimates among Canadian adults for the Omicron BA.1/1.1 wave.

Materials and Methods

We used data from the nationally representative Action to Beat Coronavirus (Ab-C) study, which included serology testing and a survey questionnaire on self-reported symptoms, their duration and severity, and viral testing history.

We focused on the Omicron BA.1/1.1 wave onwards, where data were most complete. We stratified the cohort into four distinct groups based on seropositivity (presence of antibodies to nucleocapsid protein), viral test status, and any initial symptoms around positive viral test (Figure 1). The group that was both seronegative and did not report a positive viral test served as a baseline for chronic symptoms not associated with COVID.

We calculated the proportion of participants with $\geq$ 1 or $\geq$ 2 symptoms that lasted 12 weeks or longer and derived their 95% confidence intervals (CIs) using logistic regression models. We further examined the number of symptom weeks experienced by the participants. Analyses were conducted for all ages and both sexes combined, as well as by age and by sex.

Results

The proportion of participants with $\geq$1 symptoms lasting 12 weeks or longer was 13% (95% CI: 11-15%) for the seropositive and symptomatic test-positive cases. Those asymptomatic around testing or who were seropositive but did not have a positive viral test had similar proportions (5% [2-11%] and 6 [4-8%], respectively) to those who were negative for serology and viral testing (4% [4-5%]). The proportion with $\geq$2 symptoms showed similar patterns, but with reduced proportions overall (Figure 1).

Figure 1. Proportion with $\geq$1 or $\geq$2 symptoms lasting $\geq$ 12 weeks, stratified by group, age, and sex
* Zero or small number of participants belonged to this group, thus estimates were absent or with wide 95% CI.

Among those who were seropositive and symptomatic around positive viral tests, females had higher proportion with $\geq$1 symptoms (18% [14-21%]) than males (9% [6-12%]) at ages 18-59 years (Figure 1). The proportions and the sex difference were reduced at $\geq$60 years old (females: 16% [10-22%], males: 7% [4-12%]).

The average number of symptom weeks experienced was highest among those who were symptomatic around positive viral test (~9 weeks). However, for those who were asymptomatic at testing or seropositive but had no positive viral test, the number of symptom weeks were more similar to the seronegative group (about 2 to 3 weeks). Age and sex differences for these results were similar to those for the proportion with symptoms (Table 1).

Age group (years)	Sex	Serology	Viral test result	No. cases	Avg. symptom weeks
18 to 59	Male	Positive	Positive (With symptoms)	365	6.5
		Positive	Positive (Asymptomatic)	38	3.5
		Positive	Negative or missing	141	3.1
		Negative	Negative or missing	425	1.5
	Female	Positive	Positive (With symptoms)	456	11.4
		Positive	Positive (Asymptomatic)	20	0.2
		Positive	Negative or missing	247	3.7
		Negative	Negative or missing	831	2.8
60 or older	Male	Positive	Positive (With symptoms)	143	5.0
		Positive	Positive (Asymptomatic)	23	1.9
		Positive	Negative or missing	107	2.3
		Negative	Negative or missing	504	1.0
	Female	Positive	Positive (With symptoms)	139	8.7
		Positive	Positive (Asymptomatic)	16	2.8
		Positive	Negative or missing	135	1.2
		Negative	Negative or missing	742	2.7

Table 1. Average number of symptom weeks by serology and viral test result, by age, and by sex

Discussion

Our estimate of long COVID prevalence was approximately 13%, with prevalence among the asymptomatic cases being much lower. These are near the lower end of the 10-30% range of long COVID incidence for non-hospitalized populations reported elsewhere,[1] which could be due to the lower risk of the Omicron variants compared to earlier SARS-CoV-2 variants.[2]

We will further refine the analysis by incorporating severity of symptoms,[3] as well as by accounting for the baseline chronic symptoms not attributable to COVID infection.

Conclusion

Long COVID is primarily experienced by those with initial symptomatic infections. When studying long COVID, a combination of serology and viral test status helps to distinguish long COVID symptoms from background chronic symptoms, and to identify those most at risk of developing long COVID.

References

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