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Letter to the Editor

Prevention of healthcare-associated respiratory-viral infections amongst oncology inpatients: Infection prevention outcomes during coronavirus disease-2019 pandemic



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To the Editor,

We read with interest the article by Elkrief *et al.* that reported high mortality amongst healthcare-associated (HA) cases of coronavirus disease-2019 (COVID-19) infection in oncology inpatients, with almost one-fifth of cases attributed to HA transmission [1]. Indeed, HA transmission of SARS-CoV-2 poses a substantial problem in cancer centres; in a study describing the impact of COVID-19 on a large cancer centre during the first wave of the pandemic, the majority of patients tested COVID-19-positive after an emergent or elective hospital attendance [2]. The ongoing pandemic has provided the impetus for introduction of extensive infection-prevention measures in cancer centres, including segregated isolation wards for symptomatic patients, screening of visitors for fever and respiratory symptoms,

and heightened COVID-19 surveillance for healthcare workers (HCWs) [3]. Outside the pandemic setting, however, patients with cancer are more likely to experience prolonged illness from respiratory-viral infections (RVIs) and outbreaks of HA-RVI sporadically occur on inpatient oncology units [4]. The impetus for implementation of aggressive infection-prevention measures against COVID-19 on inpatient oncology units may potentially reduce HA-RVI as an additional positive consequence.

From January 2020 onwards, a COVID-19 containment strategy was implemented on the inpatient wards of the Singapore General Hospital, which hosts the inpatient wards of the National Cancer Centre, Singapore (NCCS). Approximately 70% of all cancer cases in Singapore are seen at the NCCS, with more than 9000 new cancer cases and more than 1 million patient visits yearly [5]. Pre-pandemic, oncology inpatients were predominantly nursed in multi-bedded open-plan cohorted cubicles, with single rooms prioritised for patients with neutropenia. During the COVID-19 outbreak, universal masking was extended hospital-wide and additional infection-prevention measures

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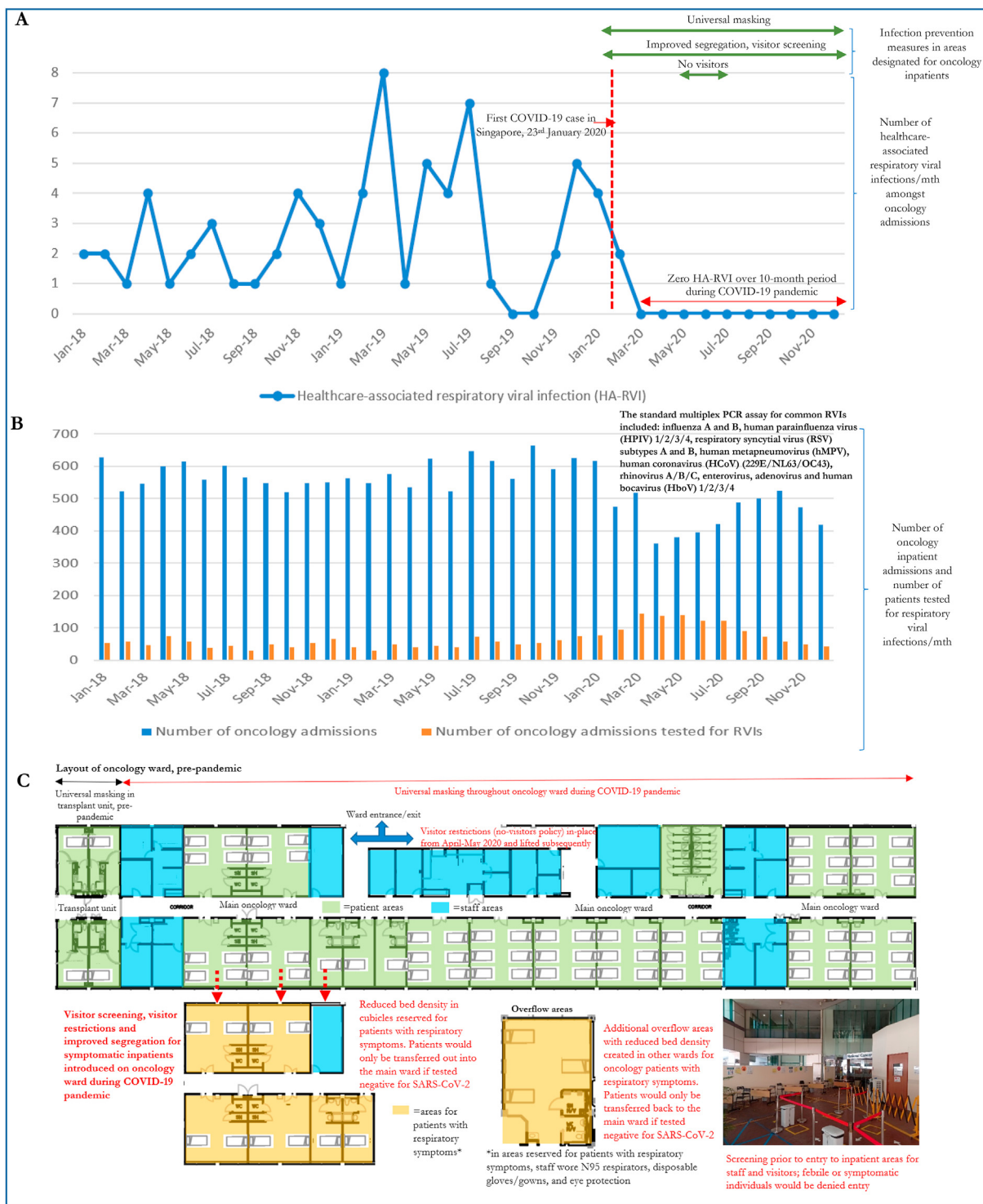


Fig. 1. Rates of healthcare-associated respiratory-viral infections amongst oncology admissions at the National Cancer Centre, Singapore, before and during COVID-19 pandemic.

were introduced, including screening of visitors for fever and respiratory symptoms and improved segregation of patients with respiratory symptoms [5,6]. All HCWs monitored fever twice-daily; HCWs with fever or acute respiratory illness underwent mandatory COVID-19 testing and were given 5 days of mandatory medical

leave [7]. A one-visitor policy was in-place throughout the COVID-19 outbreak; from 7th April 2020 to 2nd June 2020, no visitors were allowed, during the ‘lock-down’ period when all schools and workplaces were closed to mitigate COVID-19 transmission [8]. Before the pandemic, symptomatic inpatients were tested for 16

common RVIs via multiplex polymerase chain reaction (PCR); during the pandemic, respiratory specimens were additionally sent for SARS-CoV-2 testing. Cases of RVI were categorised as HA-RVI if the RVI was identified beyond the maximum incubation period for that virus, from the time of admission.

Our results showed a significant and sustained reduction in HA-RVI amongst oncology inpatients admitted during the pandemic when compared against the preceding 2 years (Fig. 1a). The incidence rate of HA-RVI was 1.4 cases per 10,000-patient-days (6 cases, 44,048 patient-days) during the pandemic, compared with 6.4 cases per 10,000-patient-days (64 cases, 100,348 patient-days) pre-pandemic; the decline was statistically significant (incidence rate ratio = 0.21, 95% confidence interval [CI] = 0.08–0.49, $p < 0.001$). Notably, zero episodes of HA-RVI were recorded amongst all oncology inpatients admitted over a 10-month period from March to December 2020, an unprecedented observation in the preceding 2 years. This was observed despite increased testing for other common RVIs during the pandemic period, likely because of increased vigilance (Fig. 1b). Over the pandemic period, 20.7% (1154/5575) of oncology admissions were concurrently tested for common RVIs, compared with 8.9% (1230/13,877) of admissions in the pre-pandemic period; this was statistically significant (odds ratio = 2.68, 95% CI = 2.46–2.93, $p < 0.0001$). Despite concurrent demands for COVID-19 testing, continuous surveillance for other common RVIs was maintained during the pandemic with no interruptions. During the pandemic, despite managing ≥ 1600 cases of COVID-19 in our institution, there were no cases of HA transmission of COVID-19 amongst oncology inpatients and no cases of COVID-19 amongst NCCS staff [5,9]. Oncology services were safely continued with additional infection-prevention measures (Fig. 1c) that mitigated risk to staff and patients, maintaining patient confidence and allowing for continuity of cancer care during an ongoing pandemic [10]. Infection-prevention measures originally meant for COVID-19 containment have value in mitigating HA-RVI amongst patients with cancer and should be continued in some form even after the pandemic is over.

Author contributions

L.E.W. contributed to concept and design. L.E.W. and E.P.C. contributed to analysis of data. L.E.W., Ng, C.K.T. and I.V. contributed to drafting of manuscript.

Supervision: Venkatachalam.

Ethics approval

As this study used aggregated anonymised data collected as part of routine surveillance, waiver of

informed consent was obtained from our hospital's institutional review board.

Conflict of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- [1] Elkrief A, Desilets A, Papneja N, Cvetkovic L, Groleau C, Lakehal YA, et al. High mortality among hospital-acquired COVID-19 infection in patients with cancer: a multicentre observational cohort study. *Eur J Canc* 2020 Nov;139:181–7. <https://doi.org/10.1016/j.ejca.2020.08.017>.
- [2] Angelis V, Tippu Z, Joshi K, Reis S, Gronthoud F, Fribbens C, et al. Defining the true impact of coronavirus disease 2019 in the at-risk population of patients with cancer. *Eur J Canc* 2020 Sep;136:99–106. <https://doi.org/10.1016/j.ejca.2020.06.027>.
- [3] Lee S, Lim AR, Kim MJ, Choi YJ, Kim JW, Park KH, et al. Innovative countermeasures can maintain cancer care continuity during the coronavirus disease-2019 pandemic in Korea. *Eur J Canc* 2020 Sep;136:69–75. <https://doi.org/10.1016/j.ejca.2020.06.021>.
- [4] Wilson KE, Wood SM, Schaecher KE, Cromwell KB, Godich J, Knapp MH, et al. Nosocomial outbreak of influenza A H3N2 in an inpatient oncology unit related to health care workers presenting to work while ill. *Am J Infect Contr* 2019 Jun;47(6):683–7. <https://doi.org/10.1016/j.ajic.2018.10.024>.
- [5] Chiang J, Yang VS, Han S, Zhuang Q, Ooi G, Sin IH, et al. Minimizing transmission of COVID-19 while delivering optimal cancer care in a National Cancer Centre. *J Canc Policy* 2020 Sep;25:100241. <https://doi.org/10.1016/j.jcpc.2020.100241>.
- [6] Wee LE, Hsieh JYC, Phua GC, Tan Y, Conceicao EP, Wijaya L, et al. Respiratory surveillance wards as a strategy to reduce nosocomial transmission of COVID-19 through early detection: the experience of a tertiary-care hospital in Singapore. *Infect Control Hosp Epidemiol* 2020 Jul;41(7):820–5. <https://doi.org/10.1017/ice.2020.207>.
- [7] Wee LE, Sim XYJ, Conceicao EP, Aung MK, Goh JQ, Yeo DWT, et al. Containment of COVID-19 cases among healthcare workers: the role of surveillance, early detection, and outbreak management. *Infect Control Hosp Epidemiol* 2020 Jul;41(7):765–71. <https://doi.org/10.1017/ice.2020.219>.
- [8] Wee LE, Conceicao EP, Sim JX, Aung MK, Venkatachalam I. The impact of visitor restrictions on health care-associated respiratory viral infections during the COVID-19 pandemic: experience of a tertiary hospital in Singapore. *Am J Infect Contr* 2020 Nov 10;(20):S0196–6553. <https://doi.org/10.1016/j.ajic.2020.11.006>. 30990-1.
- [9] Wee LE, Venkatachalam I, Sim XYJ, Tan KBK, Ruan W, Tham CK, et al. Containment of COVID-19 and reduction in healthcare-associated respiratory viral infections through a multi-tiered infection control strategy. *Infect Disease Health* 2020 Nov 16. <https://doi.org/10.1016/j.idh.2020.11.004>.
- [10] Ng KYY, Zhou S, Tan SH, Ishak NDB, Goh ZZS, Chua ZY, et al. Understanding the psychological impact of COVID-19 pandemic on patients with cancer, their caregivers, and health care workers in Singapore. *JCO Glob Oncol* 2020 Oct;6:1494–509. <https://doi.org/10.1200/GO.20.00374>.