Coronavirus Infection in Hematopoietic Stem Cell Transplant Recipients

Eichenberger EM, Soave R, Zappetti D, Small CB, Shore T, van Besien K, et al. Incidence, significance, and persistence of human coronavirus infection in hematopoietic stem cell transplant recipients. Bone Marrow Transplant. 2018 Nov 1. doi: 10.1038/s41409-018-0386-z. [Epub ahead of print] PubMed PMID: 30385869.

Piñana JL, Madrid S, Pérez A, Hernández-Boluda JC, Giménez E, Terol MJ, et al. Epidemiologic and clinical characteristics of coronavirus and bocavirus respiratory infections after allogeneic hematopoietic stem cell transplantation: a prospective single-center study. Biol Blood Marrow Transplant. 2018 Mar;24(3):563–570. doi: 10.1016/j.bbmt.2017.11.001. Epub 2017 Nov 15. PubMed PMID: 29155041.

Eichenberger and colleagues retrospectively examined the records of all 678 patients who had undergone hematopoietic stem cell transplantation (HSCT) at New York Presbyterian Hospital—Weill Cornell Medical Center over 4 years and identified 112 (17%) who had developed symptomatic human coronavirus (HCoV) infection. The median interval from transplantation to infection was 168 days; 28% were receiving corticosteroids, 28% were lymphocytopenic, and 13% were neutropenic. Coinfection with another virus was present in 31% (including 54% of those with proven/probable lower respiratory tract infection [LRTI]), and 13% were bacteremic.

A majority had cough and/or rhinorrhea, whereas 29% were febrile, 20% complained of dyspnea, and 8% were hypoxic. Thirty percent developed evidence of LRTI, but coronavirus was detected in bronchoalveolar lavage fluid of only 7 of the 11 (of 34) who underwent bronchoscopy, and 5 of the 7 had a copathogen detected. Baseline factors independently associated with proven or probable LRTI were age ≥50 years, inpatient status, corticosteroid use, and serum albumin ≤3.5 mg/dL. Mechanical ventilation was required in 10 (9%) of patients and the overall 30-day and 90-day mortality rates were 5% and 11%, respectively. Forty-six patients had repeat nasal swab testing within 4 weeks, and 27 (59%) were still shedding virus for >3 weeks, with a median duration of 4 weeks.

In a separate prospective study, Piñana used a multiplex polymerase chain reaction for detection of respiratory viruses in all allogeneic HSCT patients with respiratory symptoms over approximately 2.5 years. Among the 79 patients with a detected respiratory viral infection, 21 infections in 18 (23%) patients were due to a coronavirus, 14 of which were believed limited to the upper respiratory tract. Coinfection with another pathogen was present in 8 (38%) of the 18 patients with coronavirus infection. The attributable mortality rate was 5%.

HCovs account for as many as 10% of all acute upper respiratory tract infections in the general population, but their role in causing community acquired pneumonia in otherwise healthy individuals is uncertain, at least in part because of the frequent presence of coinfection. The virus has been associated with acute exacerbations of chronic obstructive pulmonary disease and possibly also in triggering of acute asthma attacks.

Although perhaps exaggerated by selection bias, because not all patients had follow-up testing, the frequently observed prolonged coronavirus shedding is not surprising and has previously been reported. Thus, Ogimi and colleagues reported that 17 (38.6%) of 44 HSCT patients shed the virus for ≥21 days, a finding that was associated with myeloablative conditioning, high viral load, and high dose corticosteroid therapy [1]. The same group

The consequences of coronavirus infection in HSCT remains incompletely determined, in part because of the frequent presence of copathogens. A recent report restricted its analysis to HSCT patients from whom coronavirus was detected in bronchoalveolar lavage fluid. In this study of 37 episodes in 35 patients, 54% of whom died within 90 days, 57% had a copathogen, but mortality did not significantly differ between those with and without a copathogen [2]. Whatever the pathogenic role of non-MERS, non-SARS coronaviruses in HSCT patients, we have no effective interventions in the treatment of the infections caused by them.

References
1. Ogimi C, Greninger AL, Waghmare AA, et al. Prolonged shedding of human coronavirus in hematopoietic cell transplant recipients: risk factors and viral genome evolution. J Infect Dis 2017; 216:203–9.
2. Ogimi C, Waghmare AA, Kuypers JM, et al. Clinical significance of human coronavirus in bronchoalveolar lavage samples from hematopoietic cell transplant recipients and patients with hematologic malignancies. Clin Infect Dis 2017; 64:1532–9.

Microbleeds in Infective Endocarditis: A Generally Benign Complication?

Murai R, Kaji S, Kitai T, Kim K, Ota M, Koyama T, Furukawa Y. The clinical significance of cerebral microbleeds in infective endocarditis patients. Semin Thorac Cardiovasc Surg. 2018 Oct 1. pii: S1043-0679(18)30212-0. doi: 10.1053/j. semcvs.2018.09.020. [Epub ahead of print] PubMed PMID: 30287247.

Murai and colleagues in Kobe, Japan, retrospectively examined the incidence of cerebral microbleeds (CMB) and their clinical significance in 74 patients with infective endocarditis (IE) seen at their hospital over 77 months. The 74 patients were those with IE who had undergone brain magnetic resonance imaging (MRI) and whose data were available for examination. CMB were defined as
hypointense lesions seen on T2 or susceptibility-weighted imaging that were <10 mm in diameter using either a 1.5 or 3.0 Tesla MR system. Those ≥10 mm were classified as cerebral hemorrhages. The median interval from the time of IE diagnosis to brain imaging was 1 day (interquartile range: 0–3 days). Of the 49 (66.2%) who underwent cardiac surgery as part of their treatment, the MRI was performed a median of 7 days prior to the operation in 46.

Forty of the 74 (54%) patients had at least 1 CMB, whereas no patient had a lesion >10 mm in diameter. On univariate analysis, CMB patients were more likely than non-CMB patients to be older, to have prosthetic valve endocarditis, to receive anti-platelet therapy, and to be infected with a Staphylococcus. Twenty-four of the 40 (60%) with CMB and 24 of the 34 (70.6%) without CMB underwent cardiac surgery; 17 of the 24 CMB and 13 of the 34 non-CMB patients underwent surgery within 2 weeks of IE diagnosis. Stroke, almost all of which were asymptomatic, occurred in 16% and 17%, respectively. There were no significant differences between CMB and non-CMB patients in postsurgical neurological events after either early or late cardiac surgery.

Of the 26 from the CMB group with preoperative cerebral infarction, 16 underwent cardiac surgery, and neurological “worsening events” occurred in 4 postoperatively. Two of 8 CMB patients who also had cerebral hemorrhage, such events after cardiac surgery. Only 1 patient in each group had a symptomatic neurological worsening.

Overall, there were no significant differences in in-hospital mortality (13% vs 12%) or in estimated 1-year major adverse cardiac events (MACE) (20% vs 19%). Surgery did not appear to adversely affect outcomes in patients with CMB compared to those without. In multivariate analysis, CMB was not a significant risk factor for all-cause mortality or MACE. Although retrospective, limited in size, and arising from a single center, this study indicates that microbleeds in patients are generally benign and, by themselves, are not an indication to delay needed valve surgery with its associated anticoagulation.

Case Vignette: Streptococcal Gastric Necrosis

Kobus C, van den Broek JJ, Richir MC. Acute gastric necrosis caused by a β-hemolytic streptococcus infection: a case report and review of the literature. Acta Chir Belg. 2018; 1–4.

A previously healthy 57-year-old woman presented in shock after a 3-day history of cramping upper abdominal pain and vomiting. In addition to being hypotensive, she was hypoxemic, hypothermic, and had cyanotic extremities, as well as abdominal tenderness. She had a metabolic acidosis with elevated serum lactate and creatinine. Abdominal computed tomography (CT) revealed slight thickening of the gastric wall.

The patient was resuscitated with fluids and underwent endotracheal intubation and received ceftriaxone, metronidazole, and gentamicin. Endoscopic examination revealed “a livid aspect of the entire stomach with pale areas and partly hemorrhagic mucosa.” On exploratory laparotomy, the stomach appeared ischemic and partly necrotic, and a total gastrectomy was performed. The patient progressively deteriorated and died 24 hours after her surgery. Culture of the stomach as well as blood had yielded Streptococcus pyogenes.

Separately, Ramphal and colleagues reported the case of a 45-year-old man who similarly presented with abdominal pain and tenderness, together with nausea and vomiting for 3 days. Abdominal CT examination revealed diffuse gastric wall thickening, and diffuse edema and erythema of the gastric wall was observed during endoscopy. Cefuroxime and metronidazole were administered, but the patient developed septic shock. Gastrectomy was performed, and pathological examination and culture led to a diagnosis of phlegmonous gastritis due to S. pyogenes. The patient improved and was discharged 2 weeks after the gastrectomy.

Frank gastric necrosis, as seen in the first case, is apparently quite rare. Somewhat more commonly described are cases of acute phlegmonous gastritis, which may be caused by a variety of organisms, but with S. pyogenes accounting for at least one-fifth [1]. However, all these cases likely reside along a continuum with the likelihood of progression presumable related to both delays in intervention and to the virulence of the etiologic pathogen.

Reference

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