assistance with the diagnosis and treatment of patients with this disease.

Otha Myles, MD
Glenn W. Wortmann, MD
James F. Cummings, MD
R. Vincent Barthel, MD, MPH
Sugat Patel, MD
Nancy F. Crum-Cianflone, MD, MPH
Nathan S. Negin, MD
Peter J. Weina, MD, PhD
Christian F. Ockenhouse, MD, PhD
Daniel J. Joyce, DO
Alan J. Magill, MD
Naomi E. Aronson, MD
Robert A. Gasser Jr, MD

Correspondence: Dr Myles, Division of Retrovirology, Walter Reed Army Institute of Research, 1 Taft Ct, Ste 250, Rockville, MD 20850 (omyles@hivresearch.org).

Author Contributions: Study concept and design: Myles, Wortmann, Cummings, and Gasser. Acquisition of data: Myles, Wortmann, Cummings, Barthel, Patel, Crum-Cianflone, Negin, Weina, Ockenhouse, Joyce, Magill, Aronson, and Gasser. Analysis and interpretation of data: Myles, Wortmann, Cummings, Barthel, Crum-Cianflone, Weina, Magill, Aronson, and Gasser. Drafting of the manuscript: Myles, Wortmann, Patel, Magill, and Gasser. Critical revision of the manuscript for important intellectual content: Myles, Wortmann, Cummings, Barthel, Crum-Cianflone, Negin, Weina, Ockenhouse, Joyce, Magill, Aronson, and Gasser. Administrative, technical, and material support: Myles, Cummings, Patel, Negin, Weina, Ockenhouse, and Aronson. Study supervision: Myles, Wortmann, Crum-Cianflone, Magill, and Gasser.

Financial Disclosure: None reported.

Disclaimer: The opinion or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Departments of the Army, of the Navy or of Defense.

Additional Contributions: We thank all of the individuals involved at the various institutions providing clinical care and diagnostic services for these patients, especially the nursing staff in the infectious disease clinic and medicine ward at Walter Reed Army Medical Center; the diagnostic laboratory staff at the Walter Reed Army Institute of Research and the Armed Forces Institute of Pathology (Ron Neafie, MS, and Peter McEvoy, MD); Barbara Herwaldt, MD, MPH, at the CDC; and the physicians at Landstuhl Army Medical Center, Germany (Fareed Sheikh, MD, Donald Edelheit, MD, James Hu, MD, and Donald Taillon, MD).

a plasma EBV DNA rise from 2062 to 26 480 copies/mL over 3 weeks. No other viruses were detected in the plasma. A course of intravenous immunoglobulin, foscarnet sodium (3 g/d), and etoposide (150 mg/d for 5 days) was given. The EBV DNA became undetectable after 1 week. To reduce adverse effects, highly active antiretroviral treatment was discontinued 5 weeks after starting antituberculosis therapy and 3 days before starting foscarnet therapy. The HIV load at this time was undetectable (<400 copies/mL).

The patient’s condition, however, deteriorated with fulminant sepsis and multiorgan failure, requiring intensive care. Three sets of blood cultures from different sites grew Staphylococcus epidermidis. Although the patient responded well to empirical broad spectrum antibiotics and was extubated 4 days later, he remained neutropenic, thrombocytopenic, and in renal failure and died a week later.

Because this patient’s infections (HIV, tuberculosis, and EBV) were effectively suppressed, a possible role for cytokines was investigated. Plasma TH1 cytokine interferon gamma (IFN-γ), TNF-α, tumor necrosis factor α, interleukin cytokine interleukin-2 (IL-2), IL-6, IL-10, IL-12, CCL3, MIP-1α, CCL4, and CXCL10 were effectively suppressed, a possible role for anticytokine antibodies) may be beneficial in such severe HPS cases and demonstrates that cytokine profiling enhances the understanding and management of immune-mediated diseases.

Chun K. Wong, PhD
Bonnie C. K. Wong, MRCP
K. C. Allen Chan, MRCP, FRCPA
Gavin M. Joynt, FCCP, FHKAM
Florence Y. H. Y. Yap, MRCP, FHKAM
Christopher W. K. Lam, PhD, FRCPath(Hon)
Nelson Lee, MRCP, FHKAM
Shui S. Lee, FRCP, FHKAM
Clive S. Cockram, MD, FRCP
Joseph J. Y. Sung, MD, PhD, FRCP
Paul K. S. Chan, Msc, MD, FRCPath
Y. M. Dennis Lo, FRCP, FRCPath
Julian W. Tang, PhD, MRCP, MRCPath

Correspondence: Dr Tang, Department of Microbiology, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, New Territories, Hong Kong SAR (julian.tang@cuhk.edu.hk).

Author Contributions: All authors had full access to all of the data in this study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Tang. Acquisition of data: C. K. Wong, B. C. K. Wong, K. C. A. Chan, Joynt, Yap, Lam, N. Lee, S. S. Lee, and Tang. Analysis and interpretation of data: C. K. Wong, B. C. K. Wong, K. C. A. Chan, Lam, N. Lee, Cockram, Sung, P. K. S. Chan, Lo, and Tang. Drafting of the manuscript: C. K. Wong, Yap, N. Lee, Cockram, and Tang. Critical revision of the manuscript for important intellectual content: B. C. K. Wong, K. C. A. Chan.

Financial Disclosure: None reported.

Additional Information: An online appendix is available at: http://ihome.cuhk.edu.hk/~b576778/Online%20Appendix.pdf.


Clinical and Laboratory Findings in Individuals With Acute Norovirus Disease

Noroviruses are a major cause of foodborne disease outbreaks. Our primary understanding of norovirus disease manifestations stems from volunteer studies, but a norovirus outbreak at a small college provided the opportunity to delineate findings in naturally occurring illness.

Methods. On April 19, 2005, students at Worcester Polytechnic Institute (WPI), Worcester, Massachusetts, began developing gastroenteritis symptoms. During the next 48 hours, more students became ill, with most reporting symptoms the evening of April 20, 2005, after the student health clinic had closed. Ultimately, 39 students were referred to 3 local hospital emergency departments (Figure).

A systematic review of available medical records was undertaken with the Worcester Division of Public Health and approved by the institutional review boards of WPI, St Vincent Hospital, and University of Massachusetts Medical School. Inclusion criteria for the study included the following: (1) symptom onset between 6 AM April 20 and midnight April 21, 2005; (2) on-campus residence; (3) symptoms of nausea, vomiting, diarrhea, or abdominal pain; and (4) the absence of another likely cause of their symptoms. Available stool specimens from students and food handlers were tested for norovirus by reverse transcription–polymerase chain reaction (RT-PCR) at the Massachusetts Department of Public Health, Boston.

Results. No common food source was identified, but norovirus genogroup II was detected by RT-PCR in 4 of 9 students’ stool specimens and in 1 food handler specimen. Ninety students reported possible gastroenteritis, but 6 cases occurred outside of the time criteria. Two students had other, more probable, causes of illness. A total of 82 students met inclusion criteria, and 55 clinical profiles were available from questionnaires and medical charts. Sixty individuals (73%) were male, with a mean age of 19.1 years (range, 18-23 years). Predominant symptoms were abdominal pain (n = 79; 96%), vomiting (n = 75; 91%), and diarrhea (n = 67; 82%); 34 (41%) of students seen in emergency departments had a fever (temperature ≥ 38°C).

Nonbloody, nonbilious vomiting varied in frequency (1 to 8 episodes) and lasted up to 12 hours. Within 17 hours of symptom onset, all treated individuals were able to tolerate oral fluid intake. A few students reported illness persistence for 72 hours.

Clinical laboratory results were most notable for leukocytosis with a neutrophil predominance; the mean absolute neutrophil count was 11 414 cells/µL (Table). For 10 of 11 students, results from a manual differential cell count demonstrated increased immature band forms. Other test results were essentially normal except for mild

Figure. Epidemiologic curve of symptom onset for gastroenteritis-like symptoms from April 19, 2005, to May 1, 2005. Those individuals whose symptoms began before April 20, 2005, or after midnight on April 21, 2005, were excluded from this study.