geal secretions (71% vs. 67%); however, these differences were not statistically significant.

Peiris and colleagues (17) have also reported that diarrhea is a common manifestation of SARS. They used RT-PCR to show the shedding of SARS coronavirus into stool, which could persist through the third week of illness. More than 70% of their patients reported diarrhea during hospitalization. Enteric infection by SARS coronavirus thus seems to be a possible explanation of diarrhea in our patients; this issue requires further study. Antibiotic treatment may also have caused diarrhea in our patients.

Acute renal failure was documented in 15 patients and contributed to mortality in 13 patients. No previous series have described acute renal failure as a complication of SARS; the likely contributing factors include dehydration due to diarrhea and poor oral feeding, septic shock as a result of nosocomial sepsis, and the side effects of drugs. Whether coronavirus has a pathogenic effect on kidneys warrants further study.

Hematologic abnormalities were common in our cohort. Sixteen percent of patients had anemia at presentation; the incidence increased to 53% during hospitalization. Because all patients received ribavirin during hospitalization, drug-induced hemolytic anemia is probably a major cause for the increased incidence. The incidence of lymphopenia was 73% at presentation and 97% during hospitalization. In Wong and colleagues’ report (18), CD4⁺ and CD8⁺ T lymphocytes were selectively depleted early in the course of SARS, and low CD4⁺ and CD8⁺ lymphocyte counts at presentation were associated with adverse outcomes. The authors found no evidence of bone marrow suppression or hemophagocytosis in their patients, and they postulated that lymphopenia was due to the virus’s direct effects on the lymphocytes or to various effects of cytokines. In our patients, ribavirin therapy may also have contributed to lymphopenia.

Thrombocytopenia was also common in our patients. The association of thrombocytopenia and other viral infections has been described elsewhere (19); this phenomenon could be immune in origin or due to the direct effects of virus on megakaryocytes and platelets. Ribavirin may have contributed to the thrombocytopenia noted in our patients. Ribavirin’s precise mechanism of action on lymphocyte and platelet count is uncertain, but bone marrow suppression may play a role. During follow-up of the discharged patients, the hematologic abnormalities resolved. The relative importance of ribavirin and the virus on these hematologic manifestations requires further study.

During hospitalization, 56% of our patients had elevated alanine aminotransferase levels. Twenty-one patients (8%) tested positive for hepatitis B surface antigen, and lamivudine prophylaxis was offered to all of them since they were receiving high-dose corticosteroids. Unlike Peiris and colleagues (17), we found no statistically significant association between chronic hepatitis B and mortality, and the prevalence of hepatitis B in our cohort could not explain the liver dysfunction observed. Whether SARS coronavirus can lead to hepatitis is unknown. Use of ribavirin and antibiotics such as clarithromycin and amoxicillin-clavulanate may have contributed to the liver function derangement. Other frequent laboratory abnormalities were elevated levels of C-reactive protein and lactate dehydrogenase.

We defined confirmed SARS according to a positive result on RT-PCR in nasopharyngeal secretions or on serologic testing for SARS coronavirus. The concordance rate of these tests was 57% in our cohort. The time of sampling plays a crucial role in the results of these two tests. Serologic methods based on enzyme-linked immunosorbent assay reliably detect antibody response beginning 20 days after the infection.