

## Persistence of Physical Symptoms in and Abnormal Laboratory Findings for Survivors of Severe Acute Respiratory Syndrome

SIR—We performed a cross-sectional study to assess the physical symptoms in and abnormal laboratory findings for survivors of severe acute respiratory syndrome (SARS) at their first follow-up visit after discharge from Princess Margaret Hospital (Hong Kong, China). Sixty-two patients who experienced the onset of SARS symptoms during the period from 18 March 2003 through 30 March 2003 were recruited. All patients had pneumonia and positive SARS-associated coronavirus (SARS-CoV) seroconversion. The mean age ( $\pm$ SD) was  $37.07 \pm 12.96$  years, the ratio of male subjects to female subjects was 0.82, and the intubation rate was 9.6%. In this cohort, 90.3% of patients received treatment with ribavirin and corticosteroids [1]. The median interval ( $\pm$ SD) between the onset of SARS symptoms and the first follow-up visit was  $6.59 \pm 1.07$  weeks.

Symptoms reported at the first follow-up visit included palpitation (45.1% of patients), exertional dyspnea (41.9%), malaise (40.3%), easy forgetfulness (30.6%), chest discomfort (22.5%), hand tremor (21%), dizziness (17.7%), depression (16.1%), myalgia (12.9%), headache (9.6%), diarrhoea (8.1%), cough (8.1%), insomnia (6.5%), and hair loss over the scalp (3.2%). No patient reported sputum production. Patients described palpitation as a paroxysmal, fast heart beat or extra heart beat sensation. A sinus tachycardia with resting heart rate of 100–110 beats/min was identified in 18% of patients complaining of palpitation.

Laboratory findings included the following mean values ( $\pm$ SD): hemoglobin

level,  $12.93 \pm 1.42$  g/dL; WBC count,  $6.71 \times 10^9 \pm 2.00 \times 10^9$  cells/L; neutrophil count,  $4.58 \times 10^9 \pm 1.75 \times 10^9$  cells/L; lymphocyte count,  $1.51 \times 10^9 \pm 0.46 \times 10^9$  lymphocytes/L; platelet count,  $308 \times 10^9 \pm 89.26 \times 10^9$  cells/L; erythrocyte sedimentation rate,  $11.86 \pm 14.47$  mm/h; albumin level,  $42.56 \pm 3.58$  g/L; globulin level,  $30.58 \pm 3.05$  g/L; bilirubin level,  $8.67 \pm 5.18$   $\mu$ mol/L; alkaline phosphatase level,  $83.2 \pm 22.44$  U/L; alanine aminotransferase level,  $28.9 \pm 13.96$  U/L; creatinine kinase level,  $104 \pm 268.9$  U/L; lactate dehydrogenase level,  $242 \pm 64.29$  U/L. At the first follow-up visit, 46.7% of patients were found to have a lactate dehydrogenase level of  $>230$  U/L. Abnormal chest radiograph findings were reported by the Department of Radiology for 35.4% of patients. These findings included patchy shadows, linear atelectasis, ground glass appearance, reticular marking, and streaky opacities. There was no significant difference in the rate of exertional dyspnea between patients with and patients without abnormal chest radiograph findings ( $P = .51$ ). For all patients, PCR of urine, nasal, and throat swab samples was negative for SARS-CoV RNA. However, for 1 female patient, PCR of a stool sample obtained 35 days after the onset of SARS symptoms was positive for SARS-CoV RNA. No person who had close contact with that patient after she was discharged from the hospital contracted SARS.

From what we have learned, some SARS survivors still had physical symptoms up to 6 weeks after the onset of SARS symptoms, although their complete blood counts, the results of their liver and renal function tests, and their erythrocyte sedimentation rates were largely normalized. The finding of abnormal lactate dehydrogenase levels may imply that patients still had not fully recovered from SARS-related tissue damage at the first follow-up visit. We should not overlook the effect of therapy with ribavirin and corticosteroids, which might have contributed to the symptoms and to the abnormal laboratory values. Physicians providing care to pa-

tients with SARS during the convalescent period should be aware of the possibility of such abnormal findings.

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## References

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