

YK Wing 榮潤國
CM Leung 梁志明

Mental health impact of severe acute respiratory syndrome: a prospective study

Key Messages

1. Psychiatric disorders and chronic fatigue were common among severe acute respiratory syndrome (SARS) survivors even after 3 years, and were associated with various functional impairments.
2. Factors associated with the post-SARS experience and dysfunctions (including perceived stigmatisation, frequent recall, medicolegal issues, and working status) were likely to be related to long-term psychiatric disorders and fatigue.
3. A proportion of SARS survivors may have partial insufficient adrenal responses, but the hypothalamo-pituitary-adrenal status was not related to the psychiatric and fatigue status.

Introduction

The severe acute respiratory syndrome (SARS) epidemic struck Hong Kong in 2003. Varying rates of mental health morbidity were reported during the acute and early discharge period.¹ The impact of SARS did not end with the resolution of the infection. During the rehabilitation period, many patients had to face psychosocial difficulties including stigmatisation, grief reactions, unemployment, functional impairment, and medical co-morbidities. Despite improvements in physical condition, the stress and psychiatric symptoms persisted even after 1 year.²⁻⁴ Chronic fatigue was common among SARS survivors.⁵ There seemed to be a reciprocal association between fatigue problems and psychiatric disorders. Dysregulation in endocrine functions, especially of the hypothalamo-pituitary-adrenal (HPA) axis, was common in those with psychiatric disorders and chronic fatigue syndrome (CFS).⁶ This study aimed to investigate the prevalence and associated risk factors for psychiatric disorders and CFS in SARS survivors, and the association between HPA status and CFS.

Methods

Data were collected from December 2005 to July 2007 in the Prince of Wales Hospital. A total of 369 Chinese SARS survivors in the New Territories East Cluster hospitals were invited to participate. Patients who were not of Chinese ethnicity and those who had medical illnesses unrelated to SARS were excluded. Personalised letters introducing the research aim and method were sent, followed by invitation by telephone. For those who could not be contacted or who declined to participate in face-to-face interviews, questionnaires were sent out to them.

Subjects were assessed by psychiatrists using the Chinese bilingual version of the Semi-Structured Clinical Interview (SCID-II). They also completed a series of psychometric inventories, including the Chinese versions of the Hospital Anxiety and Depression Scale, revised version of the Impact of Event Scale, the Global Assessment of Functioning Scale, the Quality of Life Scale, and a self-reported questionnaire enquiring demographics and subjective experiences of patients after the SARS infection. In addition, the length of hospitalisation, history of hypoxia and oxygen supplementation, intensive care unit admission, duration and dosage of steroid and ribavirin treatment, and presence of physical comorbidity were collected after a case-note review supplemented by the computerised medical information system.

For the second part of the case-control study, a proportion of the SARS survivors were invited to undergo endocrine assessment of HPA axis function. Three consecutive morning salivary cortisol levels and a low-dose short synacthen test (LDSST) were measured. Controls were recruited from the community; they had no major physical, sleep, or psychiatric disorders. Their fatigue status and 3 days of morning salivary cortisol levels were also assessed.

Results

Of the 369 eligible subjects, 233 (63.1%) responded after a mean post-SARS duration of 39 months. Among these subjects, 181 underwent interviews with

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Department of Psychiatry, The Chinese University of Hong Kong
YK Wing, CM Leung

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Principal applicant and corresponding author:
Prof YK Wing
Department of Psychiatry, Shatin Hospital,
The Chinese University of Hong Kong, 33
Ah Kong Kok Street, Shatin, NT, Hong Kong
SAR, China
Tel: (852) 2636 7748
Fax: (852) 2647 5321
Email: ykwing@cuhk.edu.hk

SCID-II for assessment of any psychiatric morbidity. Of whom, 90 were diagnosed with psychiatric illnesses and 77 were having active psychiatric illnesses at the time of interview (Table). The commonest disorders were major depressive disorder, post-traumatic stress disorder, somatoform pain disorder, and panic disorder. Although fatigue was a common symptom, only 24 to 40% of the patients fulfilled various CFS criteria. Those with psychiatric disorders and/or CFS had poorer quality of life, more subjective impairments in various functional aspects, and scored more poorly on all psychometric scales (Table).

In the multivariate analysis, the perception of stigmatisation and recall of SARS memories were associated with both lifetime and current psychiatric disorder. In addition, chronic fatigue and working status also predisposed to the risk of lifetime psychiatric disorder. In contrast, the presence of physical illness at baseline seemed to protect against the development of psychiatric problems. The presence of CFS was influenced by medicolegal issues (application for SARS fund and involvement in litigation process), perceived stigmatisation, worries over avian flu,

and background of psychiatric disorder. The HPA axis function (both LDSST and morning salivary cortisol level) was similar in those with and without psychiatric disorders and/or CFS.

Discussion

Nearly half of the SARS survivors had one or more psychiatric disorders in their lifetime; most still had the disorder, despite more than 3 years since the SARS epidemic. Chronic fatigue was common among SARS survivors. Although both psychiatric disorders and CFS were closely associated, a proportion of patients developed CFS in the absence of co-morbid psychiatric disorders. Both CFS and psychiatric disorders were associated with a variety of functional impairments.

SARS was not simply an infection but a disastrous experience for these patients. Indeed, SARS survivors shared similar psychopathologies with other disaster survivors who reported varying rates of posttraumatic stress disorder (30-40%), depression (25%), and fatigue symptoms (50%).⁷

Table. Comparison of SARS survivors with or without psychiatric disorder

Parameter	No psychiatric illness (n=91)	Psychiatric illness (lifetime or current) (n=90)	Current psychiatric disorder (n=77)
Mean±SD age (years)	44.9±15.6	44.5±12.0	45.6±12.0
% of male:female	39.6:60.4	23.3:76.7*	24.7:75.3*
Health care worker at 2003 (% of subjects)	33.0	52.2*	54.5*
Working at follow-up (% of subjects)	77.4	56.5*	53.8*
Self-reported questionnaire (% of subjects)			
Marital status			
Single/divorced/widowed	33.9	33.9	30.8
Married	66.1	66.1	69.2
SARS fund			
Not applied	73.8	41.9*	42.3*
Applied	26.2	58.1	57.7
Involvement in lawsuit	3.2	19.4*	21.2*
Stigmatisation			
No/a little bit	87.1	47.5*	43.1*
Sometimes/always	12.9	52.5	56.9
Worry about avian flu			
Never/a little bit	75.8	39.3*	35.3*
Sometimes/always	24.2	60.7	63.7
Recall of SARS memories			
Never/seldom	69.4	20.0*	14.0*
Sometimes/always	30.6	80.0	86.0
Impairment			
Mean±SD total Hospital Anxiety and Depression Scale score	9.8±5.7	20.7±7.3*	21.6±7.4*
Mean±SD total revised Impact of Event Scale score	24.3±16.9	56.0±22.9*	59.0±22.7*
Chronic fatigue (% of subjects)	45.2	75.0*	76.5*
Chronic fatigue syndrome (% of subjects)	17.7	55.1*	59.3*
Mean±SD Global Assessment of Functioning Scale score	76.9±9.2	55.7±12.1*	53.6±11.2*
Mean±SD World Health Organization Quality of Life Scale			
Physical score	54.2±26.1	34.6±19.0*	33.0±18.3*
Psychological score	64.7±12.2	41.6±16.7*	40.0±16.5*
Social score	57.9±13.2	44.1±16.7*	43.6±16.6*
Environmental score	63.4±13.0	46.9±13.6*	45.4±12.7*
Working ability [†]	43.4	82.9*	89.5*
Housework ability [†]	44.1	82.2*	87.7*
Social activities [†]	43.0	83.3*	88.1*
Leisure activities [†]	43.0	83.3*	88.2*
Intimate relationship [†]	41.6	83.5*	87.8*

* P<0.05, non-parametric Mann-Whitney U test

† Higher scores indicate more subjective impairment; non-case was compared separately with lifetime or current psychiatric case

Owing to the infectious nature of SARS, the survivors and their family members may have been stigmatised as hazardous with potential for cross-infection.⁸ The disabling symptoms (such as fatigue and non-specific pain), functional decline, and lengthy litigation processes may have further increased others' scepticism and stigmatisation. The perception of stigmatisation was the most consistent aetiological factor for the development of psychiatric disorders and CFS. It may also be amplified by the negative cognitive distortion and interpersonal sensitivity commonly seen in psychiatric disorders.

The SARS epidemic has heightened the perception of the risk posed by other potential infectious epidemics (such as avian flu). Constant alertness to the potential threats of novel infections may have perpetuated SARS survivors' traumatic experience. Recall of SARS memories and concern about avian flu were predictors of psychiatric disorders and CFS.

The protective role of physical illness (at baseline) against the development of psychiatric disorders in this SARS cohort was intriguing. In most studies, the presence of underlying physical illness usually predisposes to the risk of psychiatric disorder. However, in our SARS cohort, most of the psychiatric disorders occurred after SARS attacks and in healthy subjects, including health care workers. Those with physical illness may have had better mental preparation for handling deterioration in health, but there was a selection bias, in which those with serious and multiple medical illnesses may have died from the SARS infection.¹

Working status seemed to be associated with the presence of psychiatric disorder. The relationship could be bidirectional in that unemployment or retirement may have resulted in or from psychiatric disorder. Being a health care worker was associated with a higher risk of posttraumatic stress disorder.⁹ Ongoing adverse experiences during the SARS epidemic, the sudden change of status from being a health care worker to patient, and the proximity and similarity between their usual working area and ward environment may have increased their risk of re-experiencing the trauma.

The association of SARS fund application and litigation with chronic fatigue needs careful interpretation. Patients with more functional impairments (which may reflect long-term dysfunction) are more likely to succeed in applying to the SARS fund. A large proportion of SARS patients reported litigation against the health authority and/or employers. Those with more fatigue and prominent mental dysfunction might have negative attitude toward the health authority. In addition, the lengthy litigation process might perpetuate their mental anguish. The phenomenon known as 'compensation neurosis' remains a controversial issue.¹⁰ As the litigation process was still ongoing at the time of this study, longer-term studies are required to delineate the role of compensation and litigation in the psychopathology of

SARS survivors.

The SARS group was not significantly different from the controls in terms of the morning salivary cortisol level; subgroup analysis of SARS survivors in terms of the presence of CFS and psychiatric disorders did not yield any significant difference. Similarly, the LDSST could not differentiate the SARS survivors with or without psychiatric and/or fatigue disorders, albeit there was a proportion of patients who might be considered to have partially insufficient adrenal response to LDSST. Most of mentally ill SARS survivors declined further psychiatric management, as they worried about 'double stigmatisation'.

The response rate of 63% was modest, but it was achieved after intensive recruitment strategy and careful explanation and reassurance of confidentiality. The participants could be regarded as representative of the SARS population of the New Territories East Cluster hospitals. Not all participants completed a full set of assessments. Nonetheless, over 80% of them consented to a face-to-face psychiatric interview. In addition, a number of subjects agreed to undergo endocrine measurement. Future study should integrate both mental and physical complications in assessing the long-term outcome of SARS survivors.

Conclusions

Psychiatric disorders and chronic fatigue were highly prevalent among SARS survivors even after 3 years. They further impaired SARS survivors in various psychosocial areas. Although relative adrenal insufficiency was noted in some patients, this did not appear to influence the emergence of psychiatric disorders or chronic fatigue.

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