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Research report

# Symptoms of depression and rates of neurocognitive impairment in HIV positive patients in Beijing, China

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ABSTRACT

*Background:* In China an estimated 780,000 people are living with HIV (PLWH). In high-income countries PLWH are at increased risk of depression, with subsequent adverse consequences for quality of life, and HIV-related morbidity and mortality. There are few data from low-and middle-income countries. The aims of this country-specific investigation of the Asia Pacific NeuroAIDS Consortium (APNAC) study were to establish the point prevalence, severity and HIV-related and non-HIV related correlates of depressive symptoms in PLWH, in Beijing, China.

*Method:* PLWH attending an outpatient clinic at Ditan Hospital, Beijing were recruited consecutively. Data sources were: study-specific questions about demographic characteristics, and health behaviours, the Centre for Epidemiological Studies Depression Scale (CES-D), the World Health Organisation Self-Reporting Questionnaire (SRQ-20) translated into Mandarin and administered as structured individual interviews, and a screen battery of four standard neuropsychological tests.

*Results:* In total 50/51 (98%) eligible patients agreed to participate. Overall 28% scored CES-D $\geq 16$ or SRQ20 $\geq 10$ and 18% in these clinical ranges on both measures; 69% were classified as being neuropsychologically impaired (scoring below 1 SD of the control value on at least two tests). Higher depressive symptom scores were associated with lower education, alcohol overuse and diminished motor ability (all $p < 0.05$), but not neuropsychological impairment

*Conclusion:* Clinically significant depressive symptoms among this cohort of PLWH in Beijing occurred at 5 times the rate reported among a general Chinese urban population. No participants had been assessed for depression prior to the study and none were treated, indicating that consideration of psychological morbidity and its consequences for health behaviours should be incorporated into routine HIV care in China.

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## 1. Background

Infection with the Human Immunodeficiency Virus (HIV) incurs a significant health and economic burden to individuals and their countries at a global level. In Asia and the Pacific region there are approximately 4.8 million people living with HIV infection (PLWH) and although several countries in this region have halved their HIV incidence rates over the past decade there are still approximately 300,000 regional people newly infected with HIV annually (Unaids, 2013).

In high income countries depression occurs in approximately 20–30% of HIV positive (HIV+) populations (Pence et al., 2012) and is associated with higher mortality (Ickovics et al., 2001; Cook et al., 2004), poorer adherence to antiretroviral regimens (Ammassari et al., 2004; Kleeberger et al., 2004; Gordillo et al., 1999), reduced day-to-day functional capacities (Sherbourne et al., 2000) and may lead to an increase in risk-taking behaviour (Nyamathi et al., 1995; Rogers et al., 2003; Hutton et al., 2004; Williams and Latkin, 2005). Hence in HIV+ populations untreated depression carries the attendant risks of increased HIV transmission and HIV disease burden within the

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community. However in HIV+ populations depression can be treated and managed well (Markowitz et al., 1998; Treisman et al., 2001; Hu, 2004) which is in turn associated significantly with achieving HIV virological suppression, presumably through greater medication adherence (Tsai et al., 2010).

Most research on depression in HIV+ populations has been undertaken in high-income countries and there are relatively few data on the mental health of HIV positive people in low- and lower-middle income countries including China. Jin et al. interviewed 28 people living with HIV in either Beijing or a rural province of China and reported a lifetime prevalence of Major Depression of 79% of whom only 2 participants (9%) were being treated. More recently Su et al. (2013) examined 258 people living with HIV recruited from methadone and HIV clinics and the CDC registries in two Chinese cities, Henyang and Shenzhen. They also found a high lifetime prevalence of depression among participants (71.9%). There has also been some sampling of subgroups of HIV infected Chinese populations such as HIV infected blood donors where lifetime incidence of major depression was found to be 14% (Atkinson et al., 2011).

These findings compare to rates of depression as low as 1.8–3.2% in the general Chinese population (Shen et al., 2006; Lee et al., 2009; Ma et al., 2009). These rates are much lower than those reported in high-income countries. This discrepancy has been attributed to two factors. First, the stigma associated with a diagnosis of depression which may lead to reporting of somatic rather than emotional symptoms of psychological distress (Parker et al., 2001). Second, low reported rates of mental disorder may reflect low actual rates of this condition in a population which may have particular cultural protective factors including a tradition of stoicism, greater family support systems and lower levels of urbanisation than in high-income countries (Parker et al., 2001). However with the social and political changes associated with globalisation such as smaller family size, reduced social support associated with rural to urban migration, more industrialised employment and broader attitudes and ideals, these traditional protective factors might be becoming less effective (Chen et al., 1999). Thus there is some indication that psychological morbidity is becoming more prevalent among the general Chinese community (Chen et al., 1999; Parker et al., 2001; Hu, 2004).

Increased risk of depression in HIV-positive people in high-income countries has been attributed to low education level (Morrison et al., 2002; Cook et al., 2004), low income (Cook et al., 2004), unemployment (Zinkernagel et al., 2001; Cook et al., 2004) and inadequate perceived support from family and friends (Serovich et al., 2001; Yoshikawa et al., 2004). These have been found to be equally important across different ethnic groups (Chen et al., 1999). In China access to health, educational and economic resources may be more limited than in high income countries. In addition HIV infection remains highly stigmatised, which may also increase risk of depression symptoms (Rao et al., 2012).

The Asia Pacific NeuroAIDS Consortium (APNAC) Study was undertaken in 2006 to establish the prevalence of neuropsychological complications of HIV infection across eight countries of the Asia-Pacific (AP) region, including China (Wright et al., 2008). In the China APNAC substudy we sought to investigate the prevalence of depression and neurocognitive impairment and any associations between them in people living with HIV in Beijing China.

## 2. Methods

### 2.1. Setting

Ditan Hospital is a large, specialist infectious diseases hospital in Northern Beijing, China. There is a daily HIV and STD outpatient clinic for PLWH.

### 2.2. Participants and recruitment

All patients attending the clinic for routine review and meeting the inclusion criteria of having serostatus confirmed by Elisa, Western Blot or Rapid Testing, being over 18 years of age and capable of providing informed consent, in a one-month period were eligible to participate.

### 2.3. Data sources

Data were collected by several means.

### 2.4. Demographic and HIV health-related characteristics

Study-specific structured questions were used to assess educational status, source of HIV infection and interval since diagnosis. HIV-related morbidity and treatment regimen were extracted from the medical record using a structured data extraction form.

### 2.5. Depressive symptoms

Self-reported symptoms of depression were assessed by two widely used psychometric measures which were available in Chinese. The Centre for Epidemiological Studies Depression Scale (CES-D) is a 20-item self report instrument (Radloff, 1977). Scores on this scale have been found to correlate highly with those on other depression scales and cut-off scores validated against clinical diagnoses of depression (Radloff, 1977). Although it had not been used to assess Chinese PLWH, Lin (1989) in an investigation of 1000 Chinese people established that it was meaningful and acceptable to them. In a comparison of Chinese and American samples (Tally and Dong, 2000) the CES-D was found to have high internal consistency and a Cronbach alpha of 0.89 in the US and 0.85 in the Chinese sample.

The WHO SRQ-20 is a 20-item self-report questionnaire developed by the World Health Organisation (WHO) as a screening tool for depressive symptoms in low-income settings where it has been used as a diagnostic aid in primary health and to determine prevalence of psychiatric morbidity (Harding et al., 1980; Harpham et al., 2003). The SRQ-20 has not previously been used for research with Chinese PLWH. However the tool has been used in a Hong Kong Study on a non-HIV positive population and was found to correlate with the General Health Questionnaire (GHQ), 0.49 ($p < 0.001$) (Chan and Chan, 1983). No single set cut-off point has been established and a range of different scores (3–12) have been used to indicate presence of depression in different settings (WHO, 1994). In this study a higher cut-off point of 10 was chosen to reduce the risk of false positives and maximise specificity.

### 2.6. Screen neuropsychological test battery

The tests included in the battery were (1) Finger Tapping test (non- dominant hand); (2) Lafayette Grooved Pegboard Test (dominant hand), (3) the Semantic Fluency (category animal) and the Timed Gait test. These tests were selected to form a screening battery that has been shown to be highly sensitive to HIV-related brain injury (Van Gorp et al., 1989; Miller et al., 1990; American Academy of Neurology AIDS Task Force, 1991; Selnes et al., 1995; Brew, 2001), and can be easily adapted in cross-cultural context (Wright et al., 2008).

### 2.7. Procedures

Eligible participants were informed of the study by WL and given a participant information and consent form. Participants

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