



Identifying Symptom Patterns in People Living With HIV Disease

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Symptoms guide disease management, and patients frequently report HIV-related symptoms, but HIV symptom patterns reported by patients have not been described in the era of improved antiretroviral treatment. The objectives of our study were to investigate the prevalence and burden of symptoms in people living with HIV and attending an outpatient clinic. The prevalence, burden, and bothersomeness of symptoms reported by patients in routine clinic visits during 2011 were assessed using the 20-item HIV Symptom Index. Principal component analysis was used to identify symptom clusters and relationships between groups using appropriate statistic techniques. Two main clusters were identified. The most prevalent and bothersome symptoms were muscle aches/joint pain, fatigue, and poor sleep. A third of patients had seven or more symptoms, including the most burdensome symptoms. Even with improved antiretroviral drug side-effect profiles, symptom prevalence and burden, independent of HIV viral load and CD4+ T cell count, are high.

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HIV disease has always been associated with a high symptom burden, yet clusters of symptoms have not been defined in the current literature encompassing the contemporary era of improved combination anti-retroviral therapy (cART). Available evidence has indicated poor agreement in provider and patient assessments of the symptom experience, and patient reports of symptoms are often overlooked or under-recognized by health care providers (Justice et al., 2001; Justice, Rabeneck, Hays, Wu, & Bozzette, 1999). Patient-reported symptoms may drive treatment interruption or discontinuation, leading to poor health outcomes and decreased quality of life and/or function (Deeks, 2011; Erlandson et al., 2013; Kempf et al., 2009). Therefore, acknowledging symptoms and incorporating symptom management into clinical visits is an important strategy to improve patient-provider relations and health outcomes.

Many factors are associated with the development of symptoms in the context of HIV disease, including comorbidities, treatment side effects, and inflammatory processes (Dodd et al., 2001; Lenz, Pugh, Milligan, Gift, & Suppe, 1997). Within the symptom experience, symptoms interact with each other by moderating and mediating one another (Lenz et al., 1997). For example, pain symptoms may lead to sleep dysfunction and fatigue, which in turn may increase the experience of pain. Depressive symptoms are also associated with increased experience of pain (Merlin et al., 2012), and the combined effect of sleep and unresolved pain may further influence depression or sadness. This dynamic relationship between symptoms makes research targeting the symptom experience challenging (Cheung, Le, & Zimmermann, 2009; Lenz et al., 1997). Situational factors arising from the social and physical environment can also influence the development, experience, and interpretation of symptoms (Dodd et al., 2001; Lenz et al., 1997).

Other disease models use symptom patterns to guide management and diagnosis. For instance, polyphagia, polydipsia, polyuria, and weight loss represent a symptom cluster associated with hyperglycemia and a diagnosis of diabetes (American Diabetes Association, 2014). The symptom cluster of bloating, abdominal pain, chronic diarrhea, and/or

constipation may indicate exacerbation of irritable bowel syndrome or inflammatory bowel disease (Tontini, Vecchi, Pastorelli, Neurath, & Neumann, 2015). The objectives of our study were to investigate the prevalence and burden of self-reported symptoms in people living with HIV disease (PLWH) attending routine care at an outpatient clinic in the southern United States. This knowledge could help clinicians understand symptom patterns and inform them of underlying disease processes as seen in other diseases such as diabetes or inflammatory bowel disease.

Methods

Study Design and Subjects

The University of Alabama at Birmingham (UAB) 1917 Clinic is a Ryan White-funded ambulatory HIV clinic providing comprehensive medical care and social services including primary and specialty HIV care, mental health, and dental care, serving 3,000 adults living with HIV. Patients are able to access the site's Liver Clinic for hepatitis treatment and clinical trials. The UAB 1917 Clinic is the largest HIV health care facility in the state of Alabama. Providers are infectious disease board-certified physicians and HIV specialty nurse practitioners. Practitioners provide specialty care clinics in dermatology, endocrinology, neurology, palliative care, psychiatry, and women's health. Prior to scheduled clinic appointments, all patients privately report symptoms at an electronic kiosk using the HIV Symptom Index, a 20-item survey routinely used for clinical care and research with PLWH to capture prevalence and magnitude of HIV-related symptoms. The index was developed to identify and describe symptoms for the purpose of developing targeted interventions. It is a useful tool to consider patterns of symptoms and the impact on patient quality of life (Justice et al., 2001). Patients identify symptoms experienced and then rate each reported symptom as to the level of bothersomeness on a 5-point Likert-type scale ranging from *symptom not present* (0) to *bothers me a lot* (4). The HIV Symptom Index has demonstrated construct validity with high test-retest reliability (intra-class correlation coefficient = 0.92), and

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