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Review

Public health strategies for prevention and control of HSV-2 in persons who use drugs in the United States

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ABSTRACT

Background: Herpes simplex virus type 2 (HSV-2) affects HIV acquisition, transmission, and disease progression. Effective medications for genital herpes and for HIV/AIDS exist. Parenteral transmission of HIV among persons who inject drugs is decreasing. Reducing sexual transmission of HIV and HSV-2 among persons who use drugs (PWUD; i.e., heroin, cocaine, "speedball", crack, methamphetamine through injection or non-injection) necessitates relevant services.
Methods: We reviewed HSV-2 sero-epidemiology and HSV-2/HIV associations in U.S.-based studies with PWUD and the general literature on HSV-2 prevention and treatment published between 1995 and 2012. We used the 6-factor Kass framework to assess relevant HSV-2 public health strategies and services in terms of their goals and effectiveness; identification of, and minimization of burdens and concerns; fair implementation; and fair balancing of benefits, burdens, and concerns.
Results: Eleven studies provided HSV-2 serologic test results. High HSV-2 sero-prevalence (range across studies 38–75%) and higher sero-prevalence in HIV-infected PWUD (97–100% in females; 61–74% in males) were reported. Public health strategies for HSV-2 prevention and control in PWUD can include screening or testing; knowledge of HSV-2 status and partner disclosure; education, counseling, and psychosocial risk-reduction interventions; treatment for genital herpes; and HIV antiretroviral medications for HSV-2/HIV co-infected PWUD.
Conclusions: HSV-2 sero-prevalence is high among PWUD, necessitating research on development and implementation of science-based public health interventions for HSV-2 infection and HSV-2/HIV co-infections, including research on effectiveness and cost-effectiveness of such interventions, to inform development and implementation of services for PWUD.

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1. Introduction

HSV-2 sero-prevalence, at 20–80%, is high among different populations globally (Paz-Bailey et al., 2007) and in the United States, including persons who engage in heterosexual behaviors (Xu et al., 2006), men who have sex with men (Xu et al., 2010), and persons who use drugs (PWUD; Semaan et al., 2007). PWUD refers to persons who inject, inhale, sniff, or snort drugs (i.e., heroin, cocaine [freebase and crack], "speedball" [heroin and cocaine combined], or methamphetamine). The term PWUD is slowly replacing other terms (e.g., drug users who are dependent on drug injection or use) to emphasize personhood rather than identification with illicit behaviors (Centers for Disease Control and Prevention, 2012; Semaan et al., 2011a).

HSV-2 infection is an incurable life-long viral infection that causes recurrent genital ulcers; however, it is often unrecognized because it is asymptomatic or provides minimal signs. Although HSV-2 infection is not fatal and has rare sequelae, it facilitates HIV acquisition, transmission, and disease progression (Hayes et al., 2010; Van de Perre et al., 2008). HSV-2 infection increases the likelihood of acquiring HIV by a factor of 2–3 because HSV-2 lesions serve as HIV entry portals and recruit susceptible HIV target cells (i.e., dendritic and CD4 cells) to the genital mucosa (Centers for Disease Control and Prevention, 2010a; Freeman et al., 2006; Tobian and Quinn, 2009; Van de Perre et al., 2008; Wald and Link, 2002).

This article focuses on PWUD in the United States because sexual and social networks facilitate sexual transmission of HSV-2 and HIV, including transmission of parenterally acquired HIV to sex partners who do or do not use drugs (Adimora and Schoenbach, 2006; Friedman and Aral, 2001; Latkin et al., 2003). PWUD are at increased risk for sexually transmitted diseases (STD) through exchange of sex for money or drugs, effects of drugs (e.g., reduced inhibitions, increased sexual pleasure), and through engaging in sex as self-medication for sexual abuse or commercial sex (Des Jarlais and Semaan, 2008a; Des Jarlais et al., 2011b; Semaan et al., 2007). PWUD are also disproportionately infected with HIV compared to the general U.S. population (Centers for Disease Control and Prevention, 2012), though HIV parenteral transmission in PWUD might be lower compared to sexual transmission in PWUD (Des Jarlais and Semaan, 2008b, 2009). Earlier reviews of U.S.-based studies with PWUD published between 1995 and 2005 (mean age: mid-to-late 30s) show a much higher HSV-2 sero-prevalence (between 38% and 61%) than the 17% reported for the U.S. population aged 14–49 years (Semaan et al., 2007; Xu et al., 2006). Thus, PWUD require relevant HSV-2 interventions and specific interventions to reduce sexual transmission of HIV (Des Jarlais et al., 2009a; Meader et al., 2013; Strathdee and Sherman, 2003; Strathdee and Stockman, 2010). Such interventions are important given availability of effective therapy for genital herpes (Schiffer and Corey, 2009), role of HSV-2 in HIV acquisition, transmission, and disease progression (Delany-Moretlwe et al., 2009; Freeman et al., 2006), and focus of STD interventions on high prevalence and incidence populations (Steen et al., 2009). Accordingly, this article reviews the need for and feasibility of HSV-2 public health strategies and services for PWUD in the United States.

2. Methods

To assess HSV-2 sero-epidemiology and correlates in PWUD and the need for relevant interventions, we identified U.S.-based studies with PWUD published in English between 1995 and 2012 that tested study participants serologically for HSV-2. We searched the computerized database, PubMed, using relevant terms (e.g., 1995–2012, substance use, substance user, drug user, HSV-2, herpes, United States, and U.S.) and Boolean operators (e.g., or, and), and reviewed reference lists of retrieved articles. For eligible studies, we abstracted descriptive variables (i.e., study purpose and design and participant characteristics) and outcome variables (i.e., HSV-2 serologic tests and sero-prevalence). We used a similar search strategy to identify the literature on HSV-2 prevention and treatment (1995–2012) and reported on our search and acquisition results using reporting standards (Liberati et al., 2009; Moher et al., 2009).

Subsequently, we used the 6-factor Kass framework to assess HSV-2 public health strategies for PWUD in the United States (Kass, 2001). The Kass framework is increasingly used (Bensimon and Upshur, 2007; Berkman, 2008; Bostick et al., 2008; Pomfret et al., 2009; Semaan et al., 2011b) to assess practical and ethical factors affecting public health strategies (Bennett and Gibson, 2006; Gruskin, 2002). Similar to other frameworks (Baum et al., 2007; Bernheim et al., 2006; Childress et al., 2002; Kass, 2001), the Kass framework facilitates assessing the public health problem, identifying and evaluating acceptable solutions, and making and implementing decisions ethically (Bernheim et al., 2006). As applied to our analysis, the six factors are (1) goals of HSV-2 public health strategies, (2) potential effectiveness of HSV-2 strategies in achieving their goals, (3) potential burdens and concerns, (4) minimization of burdens and concerns, (5) fair implementation of services, and (6) balancing of benefits, burdens, and concerns (Fig. 1).

3. Results

3.1. Public health goals and needs

Our search for U.S.-based HSV-2 serologic studies with PWUD published between 1995 and 2012 identified 11 studies with PWUD who reported heavy, frequent, and long-term use of drugs (Fig. 2 and Table 1; Des Jarlais et al., 2007b, 2009a, 2010b, 2011a; Hagan et al., 2011; Hwang et al., 2000; Jones et al., 1998; Plitt et al., 2005; Ross et al., 1999, 2002; Semaan et al., 2010). All 11 studies used cross-sectional study designs or data, had a sample size ranging between 102 and 543 PWUD, and ten studies recruited participants from substance abuse detoxification programs, substance abuse treatment clinics, crack houses, or from neighborhoods, networks, or settings characterized by heavy drug use (Table 1). Participants had a mean age in the mid-to-late 30s and two studies included PWUD as young as 15 years (Plitt et al., 2005; Semaan et al., 2010).