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Review Article

The Syndemic of the Triply Diagnosed: HIV Positives with Mental Illness and Substance Abuse or Dependence

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Abstract

The syndemic between HIV/AIDS, severe mental illnesses and substance abuse or dependence is becoming routinely recognized both within the empirical literature as well as within the wider domains of public policy, public health, and intervention science. As such, efforts are being redoubled to address issues of testing for those at risk but not yet diagnosed as well as to increase treatment adherence for non-adherent HIV positive persons who are increasingly identified as complex patients, or those who present with multiple co-morbidities that span provider types and place higher burdens on service utilization. Interventions designed to link these complex patients with appropriate and cost effective treatments represent a nascent but growing research domain.

THE EPIDEMIOLOGY OF THE SYNDEMIC

The defining feature of a complex patient is the presence of diagnoses that span medical and psychiatric conditions, which may either be acute, chronic, or some combination of both, and which require consistent collaboration across provider disciplines. In increasing numbers, the complex patient contributes to a syndemic [1], which is defined as the interaction between two or more diseases, which by the nature of that interaction, serves to elevate negative health outcomes associated with either or both of the original illnesses. The term syndemic also recognizes the influence of variables such as poverty, health disparity, and stress on the course of illness. There is clear and convincing evidence that persons with serious mental illness (SMI) are at increased risk for both contracting and transmitting HIV [2-4]. This increased risk is thought to be due to high rates of substance use including injection drug use (IDU), risky sexual behavior, sexual victimization, and prostitution.

In one of the earliest studies crossing HIV/AIDS with a diagnosis of severe mental illness, more than 10% of a large inpatient psychiatric sample were identified as HIV positive [5]. Similarly, Medicaid claims data was used to calculate the odds of receiving a diagnosis of HIV given the diagnosis of serious mental illness [6]. The odds of a diagnosis of HIV concurrent with a diagnosis of schizophrenia were 1.52 but increased to an odds ratio of 3.87 when considered with a diagnosis of affective disorder. These findings become even more compelling as they emerged after controlling for age, gender, race, and persistent poverty. A broader sampling strategy assessing psychiatric inpatients and outpatients across four states revealed rates of HIV among persons with SMI at 3.1%, or roughly ten times the rate found in the general population [7].

The layering of HIV, mental illness, and substance abuse as a syndemic is the most recent addition to the set of co-morbidities associated with HIV risk [8]. Among those newly admitted to New York City inpatient psychiatric facilities [9], 5% to 8% were identified as HIV positive; 19% of homeless men were HIV positive, and 23% of those dually diagnosed with SMI and substance abuse or dependence were identified as HIV positive, revealing that almost one in five people in inpatient psychiatric units were infected with HIV. Using a Veterans Affairs sample, individuals with a diagnosis of schizophrenia were at a lower risk for HIV infection than individuals within the general VA population. Himelhoch and colleagues [10] also found that people with schizophrenia spectrum disorder were at higher risk for HIV infection. However, an interaction was found between schizophrenia and substance use where in the absence of substance use, rates of HIV were actually lower than in the general VA population.

ADHERENCE TO HIV TREATMENT

Access to treatment across all modalities of the syndemic has been demonstrated to reduce infectiousness of HIV as well as promote adaptive behavioral change and improve mental health outcomes [11]. A standard HIV treatment cascade is initiated

with a diagnosis that is followed by referral to appropriate health care providers who then initiate a treatment plan with adherence by the HIV positive individual. Assuming access to providers and necessary resources are made available, reduced infectiousness and improved health outcomes result when all elements of the treatment cascade are satisfied. Unfortunately, barriers exist at each step of the cascade beginning with low rates of testing that occur either because the individual is not aware they need to be tested, are apprehensive about the stigma associated with testing, or fearful of the result. For those people who do get tested for HIV and know their HIV positive status, consistent adherence to ART has resulted in significant reductions in viral loads and CD4 counts [12].

Once people with syndemic conditions are adherent to treatment, both individual and global health benefits accrue. Unfortunately, between 45% to 55% of those known HIV infected never enters treatment [13-15]. Perhaps even more discouraging are those who enter treatment but are not retained [16-19] and are subsequently at increased risk for viral resistance [20] . Adherence to HIV treatment regimen is poorer among persons with SMI and poses a public health threat due to higher viral loads, higher likelihood of transmission and higher likelihood of engaging in risk behaviors, and the potential for developing ARV treatment resistant virus strains due to non-adherence to prescribed treatments. Therefore, persons with SMI may serve as a vector of HIV transmission to others as well as being at risk for poorer treatment outcomes. The timing of treatment is also important as early initiation of treatment has a potent effect on reduction of viral load [21]. Of particular concern is the finding that injection drug users are disproportionately represented within the highly non-adherent group, even though they represent one of the most potent transmission vectors [22].

The economic costs to the individual and community need also to be considered. Rothbard, Blank and colleagues studied the economic costs associated with inpatient and outpatient care for persons with SMI and HIV [23] and found that together, persons with SMI, HIV/AIDS or both made up just 6.2% of the total Medicaid population but accounted for more than 36% of total Medicaid expenditures in Philadelphia. The SMI were 5.7% of the Medicaid population but accounted for over 30% of the total costs (7.9 times the costs of controls). Persons with HIV/AIDS were relatively small at only 0.3% of the population, but this group accounted for 2.5% of the costs (12.2 times the costs of controls), and persons with both SMI and HIV/AIDS were tiny at just 0.2% of the Philadelphia Medicaid population, but this tiny group accounted for a total of 3.0% of the total expenditures (22.1 times the costs of controls). Clearly the group with co-occurring SMI and HIV/AIDS had the highest costs and even a relatively expensive intervention could be cost effective for this group

TARGETED INTERVENTIONS FOR THE COMPLEX PATIENT

Methods of improving implementation of the HIV treatment cascade are of great public health significance. The challenge of the complex patient who presents with syndemic conditions is represented by the multiple challenges of accurate diagnosis, coordination of appropriate and manageable treatment plans that must be considered along with functional access to each of the treatment settings. When barriers to treatment entry are lowered and access is encouraged, adherence improves [24] entry into treatment increases along with improved retention rates and reduced HIV risk [25,26].

In our work, we have found advantages to low threshold/low intensity interventions that embrace a variety of strategies while remaining true to the underlying focus of community contact with vulnerable populations. As such, three components are intentionally triangulated. First *continuity of care*, which integrates care across inpatient and community providers. Second, *nurse health navigators* who are trained in the requisite modalities of infectious disease, mental health, and substance abuse/dependence are used to facilitate and reinforce adherence. And, third, an *intervention cascade* is implemented which allows the nurse navigators to individualize the frequency and intensity of participant contact based on key indicators of behavior. The cascade includes memory aid devices, education regarding side effects and other treatment aspects, active community outreach, direct observed therapy, and, where available and appropriate, the integration of family and friends into routine monitoring of medication and treatment adherence. Using 80% adherence as a target, the cascade increases in intensity until 80% adherence criterion is met, at which point the intensity of the cascade is reduced until adaptive behaviors return to adherent levels.

PATH INTERVENTION FOR HIV REGIMEN ADHERENCE AMONG SMI

The PATH Intervention has proven to be efficacious for individuals who are both HIV positive and SMI in a randomized -assignment, clinical trial [27] Participants received the intervention cascade as described above provided by an APN who delivered community-based care management at a minimum of one visit/week and coordinated their medical and mental healthcare for one year. 238 community-dwelling HIV- positive subjects with SMI who were in treatment at urban public mental health clinics from 2004-2008 were sampled. The main outcome measures were viral load and CD4 count at baseline and 12 months, and costs. Longitudinal models for continuous log viral load showed that the intervention group exhibited a significantly greater reduction in log viral load than did the control group at 12 months (d = -0.384 log10 copies/mm3 (95% CI = -0.165, -0.606, $p<0.05$). Differences in CD4 from baseline to 12 months were not statistically significant. Growth Curve modeling was used to examine changes from baseline to 24 months and found significant differences for biomarkers (viral load and CD4) as well as psychiatric symptoms and health-related quality of life for persons receiving PATH (Blank, Hennessy, & Eisenberg, in press). We also found the largest changes in behavior change occur between baseline and 3 months, with the vast majority of change occurring by 6 months after initiation of the Intervention Cascade.

The Intervention Cascade consisted of assignment to a nurse health navigator who provided in-home consultations and coordinated medical and mental health services for one year. The nurses collaborated with multiple prescribing providers, pharmacists, and case managers to organize medication regimens and help participants cope with barriers to medication

adherence and promote the participant's ability to self-care. The protocol included a face-to-face meeting with the participant at a minimum of once a week. The basic intervention consisted of psycho-education along with pillboxes and beeping watches and was provided to all participants in the intervention group. Adherence to HIV and psychiatric medications was calculated weekly. If adherence fell below 80%, the next step in the Intervention Cascade was implemented until adherence was maintained equal to or above 80% for three weeks. The Intervention Cascade represented a gradual increase in intensity and included activation of social networks, followed by use of beepers with alphanumeric displays, then prepaid cellular phones to encourage participants to follow their regimen. The final step in the Intervention Cascade was directly observed therapy. In addition, the APN coordinated physician appointments for the client and would attend them when there was a problem with a medication, communication, or other issues needing physician attention.

A cost analysis revealed a potential cost savings of the intervention for study participants. This project demonstrated the effectiveness of community-based APNs delivering a tailored intervention to improve outcomes of individuals with HIV/SMI, and demonstrated that persons with SMI can successfully adhere to HIV treatment and achieve undetectable viral loads with appropriate supportive services. Very few studies have examined the use of regimen management interventions for the HIV population using a RCT design 19, while even fewer have used a nurse-specific intervention and evaluated biological outcomes.

RECOMMENDATIONS

As healthcare reform continues to be implemented and the Affordable Care Act expands access to health services, an opportunity presents itself to ensure system changes are made in the provision of care for complex patient populations, such as those with HIV mental illness, and substance use or dependence. In the current healthcare system, the SMI patient would most likely be referred to a HIV medical provider in a location separate from their mental health care, requiring the patient to be responsible for arranging and keeping the appointment, as well as finding transportation. This fragmented system does not promote optimal outcomes for the HIV/SMI population [28]. The concept of the "medical home" that promotes collaborative care among specialties could be translated into treatment centers in the community that provide cost-effective and quality care specifically to syndemic populations

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