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Research article

Improving HIV post-exposure prophylaxis rates after pediatric acute sexual assault



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ABSTRACT

The purpose of our study was to increase the rate of children with appropriate HIV-PEP regimens among those diagnosed with sexual assault in The Children's Hospital of Philadelphia Emergency Department (ED). The outcome measure was the percent of patients receiving correct HIV-PEP. We retrospectively reviewed 97 charts over 31 months to define the baseline rate of children receiving appropriate HIV-PEP regimens (pre QI-implementation period: 2/2012–8/2014). Among children in which HIV-PEP was indicated following sexual assault, 40% received the recommended 28-day course. Root cause analysis indicated prescribing errors accounted for 87% of patients not receiving appropriate HIV-PEP. Process drivers included standardizing care coordination follow-up calls to elicit specific information about HIV-PEP, ED educational initiatives targeted at HIV-PEP prescribing, revision of the clinical pathway to specify indicated duration of HIV-PEP, and revision of the order set to auto-populate the number of days for the HIV-PEP prescription. During the QI-implementation period (9/2014–4/2015), the rate of appropriate HIV-PEP increased to 64% (median 60%) and the average number of days between incorrect HIV-PEP regimens was 24.5. Post QI-implementation (5/2015–3/2016), the rate of appropriate HIV-PEP increased to 84% (median 100%) and the average number of days between incorrect HIV-PEP regimens increased to 78.4. A multifaceted quality improvement process improved the rate of receipt of appropriate HIV-PEP regimens for pediatric victims of sexual assault. Decision support tools are instrumental in sustaining ideal care delivery, but require ongoing evaluation and improvement in order to remain optimally effective.

1. Background

The sexual assault of children in the United States is common. A national survey of youth and caretakers suggested that 4.6 children per 1000, or 320,400 children were sexually abuse or assaulted in 1999 (Finkelhor, Hammer, & Sedlack, 2008). National surveys of adults suggest that between 9 and 32% of women and 5–10% of men report that they were victims of sexual abuse or assault during their childhood (Briere & Elliott, 2003; Finkelhor & Dziuba-Leatherman, 1994; Kilpatrick et al., 2000; Ruggiero et al., 2004; Vogeltanz et al., 1999; Wonderlich, Wilsnack, Wilsnack, & Harris, 1996). When the sexual assault is identified acutely, typically

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within a 72-h timeframe, or when the sexual exposure results in traumatic injury to the child, urgent medical evaluation is indicated (Kaufman, 2008; Kellogg, 2005). Protocols guiding the care of acute sexual assault victims include a comprehensive physical examination, possible forensic evidence collection, and possible testing and prophylactic treatment for sexually transmitted infections (STIs) and pregnancy (Kaufman, 2008; Kellogg, 2005; Pickering, Baker, & Kimberlin, 2012; Workowski & Berman, 2011).

HIV infection has been reported in children whose only known risk factor was sexual assault, rendering the prompt evaluation and prophylactic treatment of acute victims deemed to be high risk for HIV critical to preventing transmission (Ellis, Ahmad, & Molyneux, 2005; Lindegren et al., 1998; Speight et al., 2006). Although in general, the frequency of transmission of HIV from sexual assault is low, specific circumstances such as bleeding (which often accompanies trauma) increase risk (Adams et al., 2016; Smith et al., 2016). Children, in particular, might be at higher risk of HIV acquisition because the sexual abuse of children is frequently associated with multiple episodes of assault and might result in mucosal trauma (Adams et al., 2016). HIV post-exposure prophylaxis (HIV-PEP) may therefore be initiated depending on the nature of the alleged assault, the timeframe of the assault, and the HIV risk profile of the assailant (Smith et al., 2016).

HIV-PEP has been associated with a reduced risk of HIV acquisition following occupational exposures (Cardo et al., 1997). Less is known about its efficacy in preventing acquisition following acute sexual assault. Nonetheless, if possible exposure to HIV has occurred during an acute (within 72 h) sexual assault, current treatment protocols for evaluation of pediatric victims recommend prompt initiation of HIV-PEP for a 28-day duration to prevent infection (Adams et al., 2016; Havens & AIDS, 2003; Smith et al., 2016). Available data from animal studies indicate that PEP is most effective when instituted as soon as possible after HIV exposure; it is unlikely to be effective when instituted > 72 h after exposure (Otten et al., 2000).

Although safety data are insufficient in sexually assaulted children prescribed HIV-PEP, risk for serious adverse reactions is thought to be minimal because of the short period (28-days) recommended and because HIV treatment is well tolerated by children who have not been sexually assaulted (with and without HIV infection) (Smith et al., 2016). In considering whether to prescribe HIV-PEP, health care providers should consider whether the child can be treated promptly after the sexual exposure (within 72 h), the likelihood that the assailant is infected with HIV, and the likelihood of high compliance with the prescribed medication regimen (Havens & AIDS, 2003; Smith et al., 2016). Acute care delivery for sexual assault victims frequently occurs in the emergency department (ED). Previous authors have found that ED care of these victims is often suboptimal and rates of STI testing and prophylaxis in this setting are widely variable (Merchant et al., 2008; Rovi & Shimoni, 2001; Schilling et al., 2015; Straight & Heaton, 2007). Inappropriate testing and prophylactic prescribing practices may place a child at risk for significant adverse outcomes related to undetected or undertreated infections. For patients specifically at risk of HIV transmission following acute sexual assault, the more immediate the prophylaxis is initiated, the lower the likelihood of HIV acquisition (Adams et al., 2016; Otten et al., 2000). Therefore, appropriate and accurate management of HIV-PEP following acute sexual assault is paramount, and failure of children to receive this standard of care warrants quality improvement evaluation and intervention. The aim of our project was to increase the rate of children who receive correct HIV-PEP regimens among those diagnosed with acute sexual assault at our ED. Standardized Squire guidelines were used for quality improvement project planning and manuscript preparation (Davidoff, Batalden, Stevens, Ogrinc, & Mooney, 2008).

2. Methods

2.1. Setting and patient population

The setting for our project was the ED of the Children's Hospital of Philadelphia. This is a single site ED of a large, urban, tertiary pediatric care center that has an annual census of over 90,000 patient visits. Approximately 100 children annually are evaluated for suspected acute sexual assault where evidence collection and acute care management is warranted. Given the complexities of caring for acute sexual assault victims, in 2008 our hospital developed the Sexual Assault Response Team (SART) composed of nurses and nurse practitioners skilled at performing acute sexual assault examinations and forensic evidence collection in the ED setting. A clinical pathway for sexual assault ED evaluations with an associated order set linked to the patient electronic medical record was developed in 2010 by a multi-disciplinary team led by pediatric emergency medicine subspecialists, and included child abuse pediatricians, HIV specialists, ED nurses, and ED social workers (Lavelle, Christian, Frioux, & Scribano, 2008). The SART pathway, intended for use when a child presents to the ED within 72 h of a suspected sexual assault, guides clinical decision-making around the history and physical examination, forensic evidence collection, and STI and pregnancy testing and treatment.

Pathway recommendations for HIV-PEP included indications for use and sample regimens. For children in whom HIV-PEP was indicated, the clinical pathway recommended providing the patient with a 4-day starter pack of HIV-PEP medication in the ED prior to discharge. A protocol was established which included follow-up care coordination by the child abuse team within 2–3 days of discharge. Included in this care coordination was review of medical and photographic documentation at the ED visit, and a telephone call to the child's caregiver to discuss medication management and need for follow-up in a specialty clinic for pediatric victims of sexual abuse.

2.2. Improvement team

In 2012 a multidisciplinary quality improvement (QI) team convened, consisting of ED and child abuse physicians, ED nurses, ED nurse practitioners, ED social workers, and ED child life specialists to review the medical management of acute sexual assault patients presenting to our ED. The team was developed to review cases on a monthly basis and discuss strategies to improve care. A case

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