Surveillance and Caregiver Vaccination Prevent Varicella Outbreaks in a Residential Care Facility for Children with Cancer

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LETTER TO THE EDITOR

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Varicella-zoster (VZV) causes serious complications in immunocompromised children with cancer, including need for mechanical ventilation, secondary infections, and death[1,2]. In low-middle income countries (LMIC), anti-VZV immunization is infrequent for children and non-existent for adults[3]. Therefore the source of this highly contagious infection is often a family member or caregiver. Use of the live-attenuated vaccine in immunocompromised children has risks of vaccine-induced infection and therefore limited acceptance[4]. Post-exposure prophylaxis (PEP) using anti-VZV immunoglobulin (V-ZIG) and/or treatment with acyclovir

can limit complications[5]. However, the cost of V-ZIG is prohibitive in LMIC. Treatment for VZV mandates interruptions in cancer therapy, potentially impacting outcome[6].

An accepted strategy to reduce treatment-abandonment and fever neutropenia deaths in LMIC, both of which can be related to prolonged travel times[7,8], is to provide free accommodation in the vicinity of treatment centers for children with cancer and their families. However this may present with its own unique challenges. We describe our novel experience in managing and preventing VZV outbreaks in such a residential facility.

The 1st outbreak (November 2014–January 2015) in our facility involved 5 children, 3 parents and 3 staff-members, the index case being one of the parents. All 5 children were admitted and treated with intravenous acyclovir; one needed assisted ventilation. Twenty-two/28 (79%) children residing at the facility were seronegative and received PEP with oral acyclovir (20mg/kg 4-times daily for 21-days). The 2nd-outbreak (November 2015–February 2016) involved 5 children, 3 parents and 1 staff, the latter being the index case. Ten/15 (67%) of resident children were seronegative and given acyclovir PEP; still breakthrough infections developed in 7/10 children. Though there was no mortality, affected families had to temporarily return to their homes, impacting cancer-treatment of their wards.

A screening-cum-immunization programme was initiated in March 2017. Consent was obtained. All caregivers, children, and staff arriving at the facility were counselled, information materials were shared, and they were initiated on clinical surveillance for signs and symptoms for 3-weeks post-arrival. Serological screening for all adult caregivers was performed within a week of arrival by testing for presence of VZV immunoglobulin-G (Vidas, Biomeriuex, France). Seronegative individuals were offered 2-doses (0.5 ml) of VZV vaccine (Variped Lyophilised Vaccine, Merck Sharp & Dohme, USA), 4-8 weeks apart. Females were offered pregnancy-testing prior to vaccination.

Between March 2017-November 2019, 357 caregivers were screened. Among 123 (34%) seronegative adults, 117 (95%) received 2-doses, 3 (2.4%) received 1-dose, 2 refused, and 1 caregiver was detected to have clinical VZV on post-arrival surveillance and was promptly isolated. No major adverse effects were noted in those vaccinated, except for transient rash in 2/120 (1.6%). Over this 32-month period, only 4 cases of VZV were detected among recently-arrived children by active surveillance (1 in 2018; 3 in 2019), allowing rapid intervention and preventing outbreaks.

Our experience suggests that a caregiver screening and sero-surveillance directed vaccination program can be a safe and effective intervention for limiting VZV outbreaks and can be adopted in similar housing facilities for paediatric cancer patients in LMIC.

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