NARRATIVE REVIEW

Pathways to prevention: insights on stemming HIV outbreaks in Larkana, Pakistan

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Abstract

In the past two decades, Pakistan has faced multiple human immunodeficiency virus outbreaks, with Larkana appearing to be the hub of such outbreaks. While the previous Larkana outbreaks happened in high-risk populations, the alarming outbreak in 2019 occurred in a low-risk paediatric population, raising several concerning questions. Human immunodeficiency virus infections spilling into the general population is indicative of a steady increase in the number of cases, and the failure of control strategies to stem the concentrated epidemic from evolving. Although several causative factors have been identified from previous outbreaks, the one that occurred in 2019 may have been influenced by an additional, hitherto unexplored factor; child sexual abuse. The current narrative review was planned to summarise human immunodeficiency virus risk factors and causes identified in previous Larkana epidemics, to explore potential reasons for the outbreaks in children, and to discuss possible steps needed for stemming human immunodeficiency virus outbreaks in Pakistan.

Keywords: HIV, Epidemics, Children, Risk factors, Pakistan.

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Introduction

The first reported case of human immunodeficiency virus (HIV) in Pakistan was in 1987.[1] Since then, the country has faced several HIV outbreaks, each with its own unique challenges and impact on public health. With an estimated 180,000 people infected with HIV, Pakistan has been home to several HIV outbreaks over the past two decades.[2] The initial cases of HIV in Pakistan were mostly limited to those who acquired infection in the Middle East and were expatriated.[3] Indigenous spread followed, mostly in at –risk populations. Pakistan experienced a notable HIV outbreak in 2003, which was mainly concentrated in the Larkana district of Sindh province. The outbreak primarily affected people who inject drugs (PWIDs).[4] Since then, numerous studies and the national HIV surveillance programme in 2004 have consistently affirmed the progression of an escalating epidemic.[5,6] An HIV outbreak was recorded in 2016 in the Sargodha district of Punjab province.[7] This outbreak was also linked to the use of contaminated needles and syringes by PWIDs. More recently, another outbreak in Larkana, Sindh, in 2019 caused significant alarm and gained significant attention as it affected a large number of children who tested positive for HIV.[8]

It is important to note that the exact number of HIV cases in Pakistan is likely underreported due to stigma, lack of awareness, and limited access to testing and healthcare services both in rural and urban areas. The government as well as various non-governmental organisations (NGOs) and community-based organisations (CBOs) have been working to address these challenges and implement measures to prevent and control the HIV spread in the country. The most well-known of the recent outbreaks was the one amongst children in Ratodero, near Larkana, in April 2019.[8] Outbreaks of HIV infections are not uncommon in Pakistan. In fact, there have been 4 registered outbreaks since 2018 alone.[8] The rate of increase in HIV infections has been particularly alarming, with data from the Joint United Nations Programme on HIV/AIDS (UNAIDS) in 2019 showing that infections in Pakistan had increased by 75% in 9 years from 2010 onwards, with a 405% increase in deaths related to HIV and acquired immunodeficiency syndrome (AIDS) during that period.[9]

Currently, in Pakistan, people living with HIV/AIDS (PLHIV) and infected individuals from previous outbreaks have been localised to certain at-risk populations, including PWIDs, men who have sex with men (MSMs), female sex workers and the transgender community. However, there is ample evidence that HIV infections are now spilling into the general population, as demonstrated by the 2019 Larkana outbreak that predominantly affected children and women.[8] This is alarming since it is indicative of a steady increase in the number of cases and the failure of control strategies to stem the concentrated epidemic from

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evolving into a generalised epidemic.

The current narrative review was planned to summarise HIV risk factors and causes identified in the previous HIV outbreaks, potential reasons for non-vertical infections in children, and steps needed for stemming the HIV spread in Pakistan.

Materials and Methods

A review of existing literature was conducted, with all relevant articles screened from PubMed and Google Scholar database using key words along with Boolean operators, including "Human Immunodeficiency Virus AND Pakistan", "Larkana", "HIV outbreak AND Pakistan", "HIV epidemic AND Pakistan." The articles were reviewed by 2 independent reviewers before analysis.

HIV Outbreaks in Larkana

Larkana has been at the centre of HIV outbreaks in Pakistan with 4 registered outbreaks since 2003 (Figure).[8] The first outbreak was among PWIDs, where 17(9.71%) of 175 PWIDs tested positive.[4] This was against a backdrop of prevailing data that suggested that the HIV prevalence among PWIDs was <0.5%. The second and third outbreaks in the area occurred in 2016. The second was among paediatric patients between the ages of 4 months and 8 years. The parents of the affected children tested negative.[10] The third outbreak in Larkana was on a much larger scale, with 56 out of 205 patients in a dialysis unit testing positive for HIV.[7]

The fourth outbreak occurred in April 2019, centred in the small village of Ratodero near Larkana. Of the 31,000 people screened between April and July 2019, 930 (3%) tested HIV-positive, with 79% of the infected being aged <5 years.[8] Unlike previous outbreaks in the area, the 2019 outbreak occurred in a low-risk paediatric population. Before the Ratodero outbreak, according to the World Health Organisation (WHO), only 1,200 children had been diagnosed with HIV and they were actively receiving antiretroviral therapy (ART) in Pakistan.[10] Hence, this outbreak was particularly significant since it constituted a 54% increase in the prevalence of paediatric HIV cases.[8]

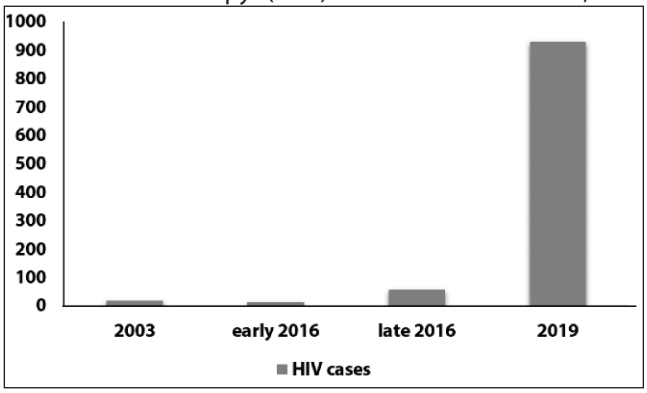

Figure: Human immunodeficiency virus (HIV) cases in Larkana, Pakistan.

Table: Reasons identified for previous HIV outbreaks in Larkana, Pakistan.

Outbreak Year	Identified Reasons
2003[4]	IV drug abuse
2016[7]	Re-use of infected injection equipment and drip sets
	Poor infection control practices
	Untrained health care workers
	Blood transfusion from unregulated laboratories
	No dedicated dialysis machines for transmissible infections
2019[10,11]	Poor infection control practices
	Re-use of contaminated needles and drips sets
	Untrained health care workers
	Unsafe blood transfusions
	Transmission from HIV positive mothers

HIV: Human immunodeficiency virus, IV: Intravenous.

Causes of HIV in Larkana

There are several reasons that have been identified for the Larkana outbreaks (Table).[4,7,10,11] Among the causes identified, poor infection control practices and untrained healthcare workers (HCWs) appear to be a long-standing issue in Pakistan. Bibi et al. found that among 53 surveyed blood banks in Karachi, only 14(26.4%) had an infection control team, and staff in only 19(35.8%) had been adequately trained in infection control practices.[12] Furthermore, significantly lower infection control practices were found in private independent blood banks and those operating without trained haematologists.[12] Besides, the Pakistan Medical and Dental Council (PMDC) estimated that around 600,000 "quacks" are practicing in Pakistan, with 200,000 of them being active in Sindh alone.[13] These quacks often perform invasive procedures, with inadequately sterilised equipment, and reuse contaminated single-use items, like needles, leading to disaster. The fact that "quacks" have been allowed to operate with relative freedom demonstrates the ineffectiveness of the medical regulatory bodies, indicating that Pakistan still has a long way to go before achieving safe, equitable primary healthcare for all. It is rather unfortunate to note that if these measures had been taken in time, the Ratodero outbreak of 2019 could probably have been prevented.

However, a largely overlooked aspect within Pakistani society is paedophilia and child sexual abuse (CSA) which could potentially be linked to the increasing incidence of paediatric HIV cases in Larkana and in other parts of the country. While prevalent in both urban and rural areas, CSA is a taboo subject within Pakistani sociocultural context and, hence, the subject has largely been swept under the rug. In Sindh, reportedly 358 children (252[70.4%] boys and 106[29.6%] girls) became victims of child abuse between

2014 and 2019.[14] Children who were victims of CSA were girls aged 1-5 and 16-18 years, while boys were found to be aged 6-10 and 11-15 years. In 2019 alone, according to an NGO, there were 1,559 cases of CSA (795[51%] boys and 764[49%] girls) and many of them were victims of rape, gang-rape and sodomy.[15] These statistics represent only the reported cases as per media reports, and are likely only the tip of the iceberg. Larkana, in particular, ranked 4th among the most vulnerable districts for CSA in Sindh, and 14th in Pakistan. According to available figures, around 14 children became victims of abuse in Larkana between 2014 and 2019.[15] It can safely be assumed that these numbers reflect significant underreporting. Additionally, Larkana is home to several brothels that provide services for all kinds of illicit sexual activities for a range of customers, especially truckers who come from different parts of the country. Children who work on the streets to raise money are often at the risk of contracting HIV when they indulge in sex in return for housing, food, entertainment, drugs, or money. While data is sparse for HIV caused by CSA in Pakistan, a study conducted in Zimbabwe found that out of 520 children who experienced CSA, 39(6%) were HIV-positive.[16] Furthermore, within the subcontinent, Tomori et al. found that young boys who experienced CSA were associated with a higher risk of acquiring HIV and were later associated with a greater prevalence of lifetime HIV risk factors, with CSA providing a conduit for future same-sex behaviours, sex work and drug abuse.[17]

Repeated outbreaks of HIV in Pakistan are a manifestation of progression of a concentrated epidemic into a generalised epidemic that is engulfing the most impoverished and vulnerable segments of population. Consistently poor infection control practices, unregulated unsafe blood transfusions, questionable ethical practices by HCWs and a general lack of awareness due to the taboo nature of the subject, coupled with suboptimal control strategies, have evidently been the main drivers of the HIV outbreaks.

Moving Forward

Recognition of all the risk factors responsible for driving the HIV epidemic in Pakistan is an important first step in devising and implementing relevant control strategies. Lack of infection control practices, especially pertaining to use of injections and non-existent waste disposal protocols, have been identified as major factors contributing to HIV outbreak which must be tackled.[7] One important step towards improving infection control practices among HCWs has been the regular training sessions provided by the Medical Microbiology and Infectious Diseases Society of Pakistan (MMIDSP) through its Memorandum of Understanding (MOU) with the Sindh Healthcare Commission (SHCC).[18] Additionally, training of healthcare staff is paramount and identification and subsequent removal of untrained HCWs, or "quacks", needs to be done urgently by the relevant authorities. However, without a concentrated and sustained effort from the government and funding agencies, this initiative on its own may not have a significant and immediate impact in preventing the expansion of the HIV epidemic in Pakistan.

As with any infectious disease, a strong emphasis needs to be placed on HIV testing from the grassroots level. Emphasis on testing will enable Pakistan to achieve the 95-95-95 target, which is a metric devised by the UNAIDS to track the progress of national HIV efforts to ensure that by 2025, 95% of PLHIVs will know they are infected, 95% of PLHIVs will be accessing treatment, and 95% of PLHIVs on treatment will have viral loads that are suppressed.[9] As it stands, this target is woefully beyond Pakistan's reach, with data in 2018 demonstrating that only 14% of PLHIVs knew their status, and only 10% of PLHIVs were on treatment.[9] Testing capacity and coverage may be increased via the usage of a programme similar to the Lady Health Worker (LHW) programme that has yielded a reasonably strong result in the domain of family planning in Pakistan.[19] Door-to-door testing in HIV hotspots of the country, as well as in regions with high numbers of members of major at-risk populations, will enable a greater understanding of the spread of HIV in the country, since currently, the majority of data is obtained through sporadic screening camps that are set up during identified outbreaks. This data on its own is not enough to accurately quantify the burden of the disease. Under the National AIDS Control Programme, community-based prevention services have been launched in collaboration with several CBOs aimed at providing testing and counselling services to members of at-risk population.[20] Furthermore, there are currently 51 sites delivering HIV diagnostics (screening, viral load) and ART free of cost under the National AIDS Control Programme. CBOs are relatively few in number, catering to a population of over 220 million. The current emphasis of CBOs seems only to be on major at-risk populations, ignoring the rise of HIV in the general and bridging populations. The possibility that the CBOs may be perpetuating stigma and actually discouraging HIV screening, rather than promoting health-seeking behaviour in at-risk populations needs serious consideration.

Given the sociocultural context, in order to sustainably stem the spread of HIV, there is also a pertinent need to address the taboo and stigma associated with the disease in both at-risk and general populations. The taboo associated with HIV stymies any awareness of the disease and this is evident from emerging data, with one report

showing that only 5.2% of young men and 4.9% of young women were aware of the appropriate practices related to HIV prevention.[9] This calls for spreading awareness on the modes of transmission of the disease via relevant media platforms nationwide, as well as setting up specialised clinics, not as 'HIV Clinic' per se, as this would lead to stigmatisation, but as part of integrated or undifferentiated clinic, which provides care for common communicable and non-communicable diseases, in identified hotspots and urban centres. These can provide clinical care and serve as centres of dissemination of information. Integrated health services providing HIV care need to be established to have some hope of meeting the UNAIDS 2025 targets.

Finally, the role of CSA and its possible link with the rise of paediatric HIV infections need to be explored in greater depth. CSA can lead to direct HIV transmission within the paediatric population or can even be associated with HIV-risk behaviours later in the future.[21] Although there is a lack of current evidence to substantiate this claim fully, it has been largely overlooked by society due to the taboo nature of the subject. According to a British Broadcasting Corporation (BBC) Urdu report, the statistics presented in the National Assembly in 2018 showed there were around 17,862 cases of CSA reported from across the country in the preceding 5 years.[22] Even though Pakistan is a part of the United Nations Conventions on the Rights of the Child (UNCRC) and related protocols and conventions, there is a lack of child abuse preventative measures and facilities for child protection. A dearth of a coordinated effort on this front leaves Pakistan in a vulnerable position in terms of future HIV outbreaks among the paediatric population. To tackle widespread CSA, the government is required to form robust legislative frameworks, policies and programmes for child protection, and should enforce them with due commitment. Additionally, a multi-stakeholder approach should be implemented to engage the community. Awareness about child abuse and campaigns is vital among the community as well as across all educational institutions. Families should be encouraged to report CSA and should educate, support and empower their children to recognise and speak up about potential harms. Crackdowns on illegal brothels and truck stops, where paedophilia has been found to be rampant, need to be strictly enforced. Additionally, programmes regarding CSA need to be launched such that caregivers and HCWs may recognise the signs of CSA and may alert the authorities immediately.

The current review has a few limitations. Due to poor data reporting and surveillance mechanisms, the review relies heavily on available data from previous outbreaks, existing literature, and secondary sources, which may affect accuracy, completeness and representativeness of the data. Also, due to the sensitive nature of the topic, data on certain aspects, such as CSA, may be limited or underreported, leading to potential gaps in understanding. Furthermore, the recommendations provided in the review should be considered just the starting points for further investigation and evaluation. Their effectiveness and feasibility may vary depending on the local context and specific implementation strategies.

Conclusion

The need to address all underlying factors contributing to HIV outbreaks in Larkana, Pakistan, is rather pressing. Poor infection control practices, unsafe blood transfusions, and the presence of untrained HCWs are major contributors to the spread of HIV. Additionally, the often-overlooked issue of CSA as a potential driver of the increasing incidence of paediatric HIV cases must be paid attention to. Moving forward, comprehensive interventions that encompass improving healthcare practices, regulating providers, enhancing testing capacity, and addressing the taboo and stigma surrounding HIV and CSA should be undertaken.

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HAR and BJ: Responsible for data integrity, accuracy and analysis.
HAR and MHRR: Study concept and design.
MMK and MK: Draw table and figure.
All authors participated in the write-up of the final manuscript.