

Risk of Viral Hepatitis B and C Among Young Adolescents Who Inject Drugs: A Future Public Health Challenge

Varada Madge, MD; E.K. Vinayakan; Rishi Garg, Sunil Mehra, MD.

Abstract & Background: Adolescents are a vulnerable population. Given the lack of health information on injecting drugs and viral hepatitis, it is likely that many adolescents engage in unsafe injection and in sexual practices that could be risky for their health.

Aim: The present paper explores the risk profiles that make adolescents vulnerable to

Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV). It reports on the results of a study entitled “*Prevention and Early Management of Hepatitis B and C among high risk group in Amritsar and Imphal, India*”, that was conducted from October 2014 till January 2018. More information on these two states can be found in the background section.

Material and methods: In this intervention, we enrolled 1700 injection drug users (IDU); 24 of the total sample were adolescents. A risk assessment tool was used to monitor their health status and adherence to harm reduction practices. Since the number was small, simple frequency distribution (number and per cent) was used to analyse the data and to elucidate the overall results.

Results: We found that 25 of 29 adolescents were sexually active and most of them did not use protective methods, such as condoms. Seven were injecting more than 30 shots per day and eight adolescents mentioned that they shared needles. Three adolescents in this intervention, were diagnosed with HCV and were linked to treatment during the project period. Four adolescents showed symptoms of STI and had been treated for the same in the prior year.

Conclusion: Our findings suggest a need to target younger populations for intervention. They need ongoing education on harm reduction practices and medical follow-up to

Varada Madge, MD

Title: Regional Manager

Affiliation

Email: varada@mamtahimc.org

E. Vinayakan

Title: Deputy Director

Affiliation

Email: vinayakan@mamtahimc.org

Rishi Garg

Title: Seior Program Officer

Affiliation

Email: rishi@mamtahimc.org

Sunil Mehra, MD

Title: Executive Director

Affiliation

Email: dr_mehra@mamtahimc.org

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reduce the risk of transmission of HBV and HCV.

Background

The Indian National AIDS Control Programme (NACP) has targeted injecting drug users for the dissemination of information on the prevention of Human Immunodeficiency Virus (HIV) and Acquired Immuno Deficiency Syndrome (AIDS). Although the NACP has addressed HIV, co-infection of HIV-HCV is on the rise; this contributes to the country's overall hepatitis burden, contributing to HIV related mortality.

In recent years, injecting drug use has become a growing problem among adolescents in India. Unless awareness of the harmful effects of injecting drugs is widely disseminated, it is likely that adolescents may engage into unsafe sexual and injecting practices. This puts them at risk for HBV and HCV infections.

Globally, around 67 % of people injecting drugs are also infected with HCV, and an estimated 8.4% with HBV (Nelson PK *et al*, 2011). While the majority are adults, the World Health Organization's (WHO), global strategy requires that children and adolescents must be included in harm reduction campaigns. (Global Strategy for Women, Children and Adolescent Health: Thrive and Transform 2016).

Background to Punjab & Manipur

60% of the Manipuri population belongs to the 'Meiti' tribe who are Hindus. There are about 30 hill tribes and the two main tribal groups are the 'Kukis' of the south and the 'Nagas' of the North. The three most prominent religions of Manipur are Hinduism, Christianity and Maibaism. Handloom and handicraft products reflect their creativity. Average household size of Manipur is five. As compared to Punjab, Manipur is socio-economically a backward state. The economy of Manipur is primarily agrarian. However, it is characterized by a high rate of

unemployment, poverty, low capital formation, inadequate infrastructural facilities, geographical isolation, communication bottlenecks and practically no industrialization.

The culture of Punjab is rich and diverse. The 'Sikh' community is a majority in Amritsar district constituting about 60% of the population. The city is known for its rich cuisine. Main occupation of the state is agriculture. Kinship and strong family ties plays a significant role in the culture of Punjab. 32% of the population in Punjab is Scheduled Caste and 41% are from upper caste. Rest of the population is Jain, Muslims and Christians. Average household size of Punjab is five. Thus, socio politically both the states are different from each other.

Literature Review

Viral Hepatitis is an infectious disease caused primarily by HBV and HCV; these illnesses currently affect millions of people throughout the world. They are increasingly becoming a public health problem which calls for immediate action to provide medical care and support to all those who are infected and affected by the disease. Some studies have reported higher incidence of both HBV and HCV among HIV-infected among drug injectors, and it is suggested that prevalence of HBV may be higher among younger people who inject drugs (Des Jarlais DC, *et al*, 2013).

In a behavioural surveillance study conducted across five states in India (Chennai, Delhi, Kolkata, Manipur, Mumbai), almost 24% of the 1,355 subjects recruited were young adolescents under the age of 20 years who were also injection drug users. 2.4 per cent began injecting under the age of 16 years and 21.6 per cent initiated injecting drugs between the ages of 16 and 20 years (Harm Reduction International Reports, 2013). In Manipur, 47% were injecting drugs when they were under the age of 20 years (2.6 per cent under 16), while in Mumbai, 5.2 per cent began under the age of 16 years

(Harm Reduction International Reports, 2013). A study on “*High burden of hepatitis C and HIV co-infection among people who inject drugs*” found a HCV prevalence 74% while 29% had HCV/HIV co-infection. (Kermode, Nuken, Kumar, Brogen *et al* 2016). A study done across 100 Indian cities among adolescents (n=4024) drug users, showed that a high proportion (12.1%) reported the use of injection drugs and 12.6% per cent reported ever injecting drugs (Dhawan, Pattanayak, Chopra and Kumar *et al*, 2016). In a study conducted by Solomon *et al* in Amritsar, Punjab showed that there is high prevalence of HCV and HIV /HCV co-infection in subjects who injected drugs. Out of 14,450 IDU, 31.2% were infected with HCV and 21.4 % were infected with both HIV and HCV infection (Solomon, Mehta, Srikrishnan *et al* 2015).

The prevalence of HBV and HCV infection in children and adolescents is thought to be grossly underestimated and the literature (or the dearth of it) aptly points out the difficulties in reaching adolescents who inject drugs; this hard-to-reach population can be characterized as “invisible.” (Dhawan, Pattanayak, Chopra, Tikoo and Kumar, 2016) due to “fear, criminalization, discrimination, violence and stigma.” Moreover, there are sensitive legal and ethical issues involving children and adolescents in research studies and interventions; these factors make it difficult to reach out to vulnerable populations.

However, it is of paramount importance to target the young population for prevention and management of viral hepatitis B and C.

Methodology

This paper attempts explores the risk profiles that make adolescents vulnerable to HBV and HCV. The intervention was conducted in two geographically and culturally different Indian States: Amritsar and Imphal. These states were selected based on the high prevalence of HCV infection among the in-

jecting drug users and state’s willingness to support the intervention. The facility from where the IDU were enrolled for the study was a Needle and Syringe Exchange Programme (NSEP) run by the Targeted Intervention- Non Governmental Organisation (TI-NGO) under the aegis of National AIDS Control Organisation (NACO). 1700 IDU were registered with the TI-NGO and all of them were selected for the intervention. The sampling for this intervention was therefore a purposive design. Out of the 1700 IDU, 29 of them were adolescents between 17 to 19 years. The intervention model included education sessions, screening for HBV and HCV, vaccination for Hepatitis B, linking to treatment services, and regular follow-ups by the out-reach workers for adherence to treatment. This intervention was conducted for a period of two years from 2014 till 2017.

Since the 29 adolescents were a small subset of the entire data collected from IDU, we analyzed available data using frequency distributions. The quantitative data was analyzed based on information collected using a structured risk assessment tool. The tool was developed with support from the State AIDS Control Society (SACS) officials and it included quantitative questions on socio-demographic information, risk, and vulnerability related to drug injecting practices, sharing of equipment, sexual practices, screening for HBV and HCV, alcohol, and usage of non-injected drugs. During the baseline study, qualitative interviews were conducted with three adolescents. The in-depth questions broadly included awareness on hepatitis, available health services, injecting patterns and reasons for drug initiation.

Intervention Process Protocol

The Out Reach Workers and District Coordinator’s made personal visits to the key locations where adolescents inject drugs. Subjects were recruited into the study, trained in data collection, ethical practices and code of conduct. The adolescents were

followed up for a period for almost three years. This follow-up included data collection for risk assessment, inviting them for education sessions on harm reduction practices, community awareness events, World Hepatitis Day events, screenings, vaccinations, access to Oral Substitution Therapy (OST), and referral for treatment of HIV, Hepatitis B, and Hepatitis C.

The risk assessment was done every quarter to trace the pattern of harm reduction practices and to provide timely assistance wherever required. This support was broadly comprised of delivering private counselling sessions for improving subject's quality of life. Live data was fed into web based software for monitoring and tracking every IDU in the intervention. A health card was also designed and the health records of every participant was maintained online. This helped the field team to track the records of every participant and track their dates for screening, vaccination and treatment.

Ethical Issues

The Technical Review Committee of MAMTA-HIMC and the Institutional Ethics Committee of the same institution approved the study. The study was supported by the local government, the head of the community organization, and the State AIDS Control Program. Prior to the interviews, participants were informed about the purpose of the intervention and were told that they could withdraw at any time. Assent was taken from every individual who was less than 18 years of age and verbal informed consent was obtained from parents before collecting any information. To protect confidentiality, potential personal identifiers were deleted from the database and each subject was assigned a Unique Identification Number (UIN).

Socio-demographic Characteristics

The mean age of the 29 adolescents in this intervention was 18 years. 25 of them were males. 26 were unmarried, two were

married and one was divorced. Six adolescents were illiterate and 23 of them were literate. 12 adolescents were unemployed and 15 were working either as full time or part time employees. Nine adolescents belonged to families with monthly income below Rs. 4500/- . 13 adolescents did not know or reveal the monthly income of their family.

In the present intervention, 12 adolescents purchased clean syringes from pharmacy, four from peddlers and 13 from Target Intervention Organizations.

Drug Usage

According to the United Nations Office on Drugs and Crime (UNODC), drug injectors are classified into two categories. Daily injectors who inject at least once a day and non-daily injectors who have less than one injecting episode per day. Those in the non-daily injector's category may or may not inject on a particular day. Going by this contextualization of UNODC, most of the young IDUs in this project injected drugs but were not daily injectors. Seven reported injecting more than 30 shots in the previous month, seven were injecting 10-30 shots per month, 10 were injecting less than 10 shots per month and five did not inject at all. 19 adolescents inject drugs in groups and the rest injected alone. By and large these practices were carried out in dingy and unhygienic spaces due to the social marginalization, criminalization, and discrimination of drug addicts in the communities they live. The drug most commonly injected was heroin.

Sharing Needles

Eight adolescents shared needles with their partners. Two of them shared needles with more than one partner. Three adolescents amongst those sharing needles were HCV positive and it was observed that they reportedly shared needles with at least two more partners in the last three months. Thus, making other peers susceptible to HBV/HCV infections.

Medical Issues

In addition to HBV, HCV and HIV infections, there were other severe medical consequences of chronic injection use that could put adolescents at risk for scarred and/or collapsed veins, bacterial infections of the blood vessels and heart valves, abscesses (boils), and other soft-tissue infections. Many of these problems are not easily treated and lead to thrombosis of the blood vessels with resultant damage to organs like lungs, liver, kidneys, and brain.

Risks of sharing needles

Tracing the patterns and practices of injecting drug users gives us some idea about the community “at risk” for Hepatitis B and C. HBV and HCV are a blood borne pathogens and the transmission risk of HBV is much higher than HIV. HBV can remain stable on environmental surfaces for at least seven days and is 100 times more infectious than HIV. Therefore, any person infected with HBV and HCV who shares needles can transmit the infections to others who are not infected.

Social determinants: ‘pre-disposition for drug initiation’

Some studies have documented that family factors such as parental substance use, physical abuse, and poor quality of relationship between parents and children are risk factors for substance use among children and adolescents (Dhawan, Pattanayak, Chopra and Tickoo 2016).

Initiation of Drug Use

The main reported reasons for which adolescents initiated drugs were primarily psychosocial issues such as feelings of being alone, worthlessness, nobody cares for them, to try new things, peer suggestions and for fun. Family reasons such as ‘being ignored,’ “conflicts and stress” within the family were documented as social reasons that they were

unable to cope with. The intervention did not focus on addressing and measuring the magnitude of mental health issues but during the intervention period it was observed that adolescents experienced depression, anxiety and loneliness.

Lack of programs for pre-adolescents

One of the adolescent IDU's from Imphal mentioned he started taking drugs when he was 11 years old and two IDU's started taking drugs when they were less than 14 years. They mentioned they had lied, cheated, robbed money and also worked as a labourer to get money for drugs. There were reported cases of selling clothes, utensils, shoes, and other items to buy drugs. This highlights the problem of drug use that has reached the younger populations and there are no community based interventions to prevent the spread of hepatitis infection.

The role of peer pressure

Peer pressure was among the most common reasons given by young IDU's for initiating drugs. Research on social networks has suggested that peer context is a robust predictor of adolescent substance uses (Mayes and Suchman, 2006; Valente et al., 2005 as cited in Mennis and Mason 2010: 153). Mostly ‘trying drugs and experimentation’ began for fun so as to get a “kick” as they say. They found it more “enjoyable” and quickly found themselves addicted to the same.

Getting sick

In the qualitative interviews, our subjects described their health problems. These included discomfort, bodily pain, headache, and vomiting and were easier to deal with than the pains of withdrawal. One subject explained: “... *it becomes difficult to withdraw due to craving*”. The young IDU's mentioned that they feared the symptoms of withdrawal which made the process of giving up on drugs very difficult.

High risk sexual practices

In the course of the intervention, the adolescents engaged in high risk sexual practices. Most of them “experimented” with different sexual practices and with new partner. This was seen as part of growing up amongst their peers. Often, these “experiments” involved risky sexual practices without proper protection, i.e. non-use of condoms. The 25 adolescents in this intervention were sexually active and engaged in multiple episodes of sex (*as stated verbally*) without using a condom. Three out of these 25 were involved with Female Sex Workers (FSWs). 21 adolescents consumed alcohol or other non-injecting drugs and indicated that they indulge into sexual practices under the influence of alcohol. Six adolescents were on STI treatment in last 12 months. It is well documented that STIs can further aggravates transmission of HIV and HBV infections.

Treatment Expenditures

It is argued that treating viral hepatitis could place a heavy burden on the health care systems given the exorbitant costs of treating liver failure and chronic liver disease. In this intervention, 13 subjects were regularly taking OST, four were irregular in taking OST. Three HCV positive adolescents were linked to treatment services run by the government. These three adolescents were from Amritsar and Punjab. One of the adolescents from Imphal, Manipur was positive but cured of HCV during the intervention period.

According to the declaration by the Ministry of Health and Family Welfare in Punjab, Hepatitis C treatment up to Rs. 150,000 (\$2,312 USD) is provided free of cost under the “*Mukh Mantri Punjab Hepatitis C Relief Fund.*” However, the PWID is required to pay approximately Rs. 6000 (\$ 92 USD) for the viral load and genotype testing before they are considered eligible for the treatment. Among the adolescents 3 were HCV

positive and two of them have virological evidence of chronicity and required further treatment for 12 weeks. The cost of 12 weeks’ treatment in India is Rs. 75,000 (\$1154 USD) for one patient and Rs. 150,000 (\$2308 USD) for two patients. The IDU's, especially the adolescents, cannot afford these expenses and therefore access to HCV treatment remains a major challenge for young people.

For the scope of this paper, we targeted only the adolescent population for analysis but there were a total of 680 IDU's enrolled in the study; 40 per cent were HCV positive and required confirmed virological evidence for treatment. As stated by the medical doctors, 544 IDU's would require 12 weeks’ treatment and 136 IDU's would require a 24 weeks’ treatment. Based on this, the overall cost the health system for treating these patients would be Rs. 61,200,000 (\$941,868.USD). This is exorbitant cost; it signifies that the country would face a huge economic burden if timely prevention strategies for viral hepatitis are not addressed.

Discussion and Conclusion

Our intervention has reported the prevalence of HCV in the adolescent population from Amritsar and Imphal. Though the sample size is very small and cannot be generalised to the larger community, it does point out to patterns of risky adolescent behaviour. It suggests that it is of utmost importance for us to target the young population.

However limited, there is some evidence that the adolescents are at risk for HBV, HCV and HIV. The costs of accessing health care services make it a challenge for adolescents. There are also feelings of ‘being small’, ‘insignificant’ and ‘fearful’ to face the health care providers. This could lead to delay in access to care and further aggravate their health conditions.

Risk practices & community support

In the adolescent population, the common and (highly risky) mode of transmission is piercing of tattoos, sharing needles and heterosexual transmission. 12 adolescents had a tattoo pierced from local vendors who did not use sterilized equipment's. Currently, there is no vaccine for HCV and awareness on prevention strategies is the best practice.

Since the adolescents showed evidence of mental health problems, intervention should involve parents, family, and schools for further care and support. We must promote an enabling environment and a safe space that improves the quality of life of adolescents. There is a need for home based care and community based interventions focusing on vulnerable groups such as adolescents. Awareness amongst peer groups is crucial. It has been observed that peers lead others on trying the drug for fun.

The National Surveillance Program

The National Viral Hepatitis Surveillance Programme (2014- 2015) was created to ascertain the prevalence of different types of viral hepatitis in different zones of the country and provide laboratory support for outbreak investigation of hepatitis through established network of laboratories. However, these facilities and services are not fully functional in India. Because India lacks a functional HCV surveillance system, there is no knowledge about the actual number of people living with HBV and HCV related liver diseases and how many have died of liver failure. The Government of India had launched a national programme for prevention and control of viral Hepatitis during the 12th Five Year Plan period. But there is no activity visible at the ground level among high risk groups such as pregnant women, sex partners of IDU's, health care providers, and vulnerable populations (such as adolescents).

In conclusion, there is a clear evidence that adolescents are injecting drugs; it is not

just an adult phenomenon. Awareness of hepatitis should be the main component of the harm reduction practices package. It is imperative that we work hard to reach the "invisible populations" such as children and adolescents.

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BIBLIOGRAPHY

- 1.Nelson PK et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. *Lancet*. 2011; 378(9791): 571–583
- 2.The Global Strategy for Women's, Children's and Adolescent's Health: Survive, Thrive and Transform, 2016-2030, Available at: <http://www.who.int/life-course/partners/global-strategy/globalstrategyreport2016-2030-lowres.pdf>, accessed online on March 2018.
- 3.Injecting Drug Users Among Under 18s: A Snapshot of Available Data. Harm Reduction International Reports. 2013. Available at: https://www.hri.global/files/2014/08/06/injecting_a_mong_under_18s_snapshot_WEB.pdf accessed online on January 2018.
- 4.Injecting Drug Users Among Under 18s: A Snapshot of Available Data. Harm Reduction International Reports. 2013. Available at: https://www.hri.global/files/2014/08/06/injecting_a_mong_under_18s_snapshot_WEB.pdf, accessed online on January 2018

5. Anju Dhawan, Raman Deep Pattanayak, Anita Chopra, Vinod Kumar Tikoo, and Rajesh Kumar (2016), "Injection drug use among children and adolescents in India: Ringing the alarm bells", *Indian Journal of Psychiatry*, vol 58, number 4, pp: 387–393.
6. Des Jarlais DC, et al. Variability in the Incidence of Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus Infection among Young Injecting Drug Users in New York City. *Am. J. Epidemiol.* 2003; 157(5): 467-471 doi: 10.1093/aje/kwf222. Available online: <http://aje.oxfordjournals.org/content/157/5/467.full#T2> Accessed: 2 October 2013
7. Sunil Suhas Solomon, Shruti H Mehta, Aylur K Srikrishnan, Suniti Solomon, Allison M McFall, Oliver Laeyendecker, David D Celentano, Syed H Iqbal, Santhanam Anand, Canjeevaram K Vasudevan, Shanmugam Saravanan, Gregory M Lucas, Muniratnam S Kumar, Mark S Sulkowski, Thomas C Quinn (2015), "Burden of hepatitis C virus disease and access to hepatitis C virus services in people who inject drugs in India: A cross-sectional study", *Lancet Infectious Diseases*, vol 15, pp:36-45
8. Michelle Kermode, Amenla Nuken, Gajendra Kumar Medhi, Brogen Singh Akoijam, H. Umesh Sharma, and Jagadish Mahanta (2016), "High burden of hepatitis C & HIV co-infection among people who inject drugs in Manipur, Northeast India", *Indian Journal of Medical Research* ", vol 143, number 3, pp: 348-356.
9. HIV and young people who inject drugs: Technical brief, Available at: <http://www.who.int/hiv/pub/toolkits/hiv-young-idu/en/>, accessed online on April 2018
10. HIV and Young People Who Inject Drugs. Technical Brief. 2015. Available at: http://www.unaids.org/sites/default/files/media_asset/2015_young_people_drugs_en.pdf, accessed online on April 2018.
11. Hepatitis B Virus: Epidemiology and Transmission Risk, Emergency Medical Injuries Guidelines, Available at- <http://www.hpsc.ie/a-z/EMIToolkit/appendices/app21-27.pdf>, accessed online on January 2018
12. http://www.unaids.org/sites/default/files/media_asset/2015_young_people_drugs_en.pdf, accessed online on January 2018.
13. Anju Dhawan, Raman Deep Pattanayak, Anita Chopra, Vinod Kumar Tikoo, Rajesh Kumar (2016), "Injecting Drug Use Among Children And Adolescents in India: Ringing The Alarm Bells", *Indian Journal of Psychiatry*, vol 58, issue 4, pp: 387-393
14. Mennis Jeremy and Mason Michael (2010), "Social and geographic contexts of adolescent substance use: The moderating effects of age and gender", *Elsevier*, vol 34, pp: 150-157.
15. What are the complications of Chronic Heroin Use, National Institute on Drug Abuse, Available at <https://www.drugabuse.gov/publications/research-reports/heroin/what-are-medical-complications-chronic-heroin-use>, accessed online on January 2018

