Readers' Forum

Recycling of Injection Equipment in Pakistan

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The prevalence of hepatitis C virus (HCV) infection is high in the general population in Pakistan, ranging from 2% to 6%.[1] Reuse of injection equipment in the absence of sterilization is common, particularly in healthcare facilities that serve low-income populations.[2] Studies have identified unsafe injection practices as a major route of transmission of HCV in Pakistan.[2-4] Changing the behavior of injection providers so that they would use new freshly opened disposable syringes would improve injection safety in Pakistan. However, frequent reports of recycling of injection equipment in the local media question the safety of apparently new syringes. Clinical laboratories are one of the major sources of production of used syringes. To evaluate the resale of used syringes, we followed the course of used syringes from their initial use to their final destination.

CLINICAL LABORATORIES AND INDIVIDUALS INVOLVED IN THE RECYCLING AND RESALE OF HEALTHCARE WASTE

Karachi is Pakistan's largest city, with a population that exceeds 10 million individuals. In June and July 2000, pathologists identified 44 clinical laboratories in Karachi with the highest workloads. Housekeeping staff handling healthcare waste at these laboratories were identified and requested to participate in the study. Scavenger boys collecting waste from community waste sites near these facilities were also identified and interviewed. This group also gave information about dealers of healthcare waste in a particular part of the city.

DUMPING AND COLLECTION OF HEALTHCARE WASTE AND ASSOCIATED HIGH-RISK PRACTICES

Twenty six (59%) of the clinical laboratories were found to be dumping used syringes in community waste sites built by the local municipal government for the collection of general waste, not healthcare waste. Three (7%) used the municipal waste collection system. Four (9%) of the clinical laboratories reported selling used syringes to healthcare waste dealers. Fifteen (88%) of 17 housekeeping employees at the clinical laboratories acknowledged selling used syringes to healthcare waste dealers. The reported selling price ranged from 3 to 10 Pakistani rupees per kilogram (US $0.06 to $0.19). Housekeeping staff reported zero to five needlestick injuries per week.

Twenty-six community waste sites where clinical laboratories dumped their waste were visited. A total of 26 scavenger boys were found sorting and collecting healthcare waste, including the used syringes. They were between 15 and 18 years old and reported visiting the waste site once in the morning and a second time in the afternoon. They reported collecting an average of 20 to 25 syringes a day and selling them for an average of 3 to 10 Pakistani rupees per kilogram (US $0.06 to $0.19) to healthcare waste dealers. Scavengers reported zero to three needlestick injuries per week.

Housekeeping staff and scavenger boys gave information on 10 healthcare waste dealers, who were contacted and interviewed. All acknowledged trading in healthcare waste and reported selling used syringes to the major dealers specializing in used syringes who were located in the major waste recycling business area of the city. Self-reported needlestick injuries ranged from zero to two per week.

Eight major dealers of used syringes identified by dealers of healthcare waste were contacted and interviewed. They all reported selling used syringes to the plasticware industry. Most of the used syringes were crushed into small granules for the manufacture of plastic items (eg, coat hangers or buckets). However, six dealers offered to supply used syringes to the investigators. Among them, two dealers offered to supply intact syringes after proper

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cleaning. One dealer offered to supply the syringes after proper cleaning and repackaging; however, he refused to provide any sample of previous orders.

The attendants of four medical stores in the vicinity of a public hospital were interviewed. They all acknowledged that used repackaged syringes are sometimes available in the marketplace. They noted that most customers cannot distinguish between used repackaged syringes and new sterile syringes. They mentioned that they could distinguish between the two based on the quality of the wrapper, the standard of labeling, the condition of the plunger, and the straightness of the needle. They all believed that used syringes were available in polyethylene wrappers sealed at both ends but different from blister packaging. They noted that blister-packed disposable syringes available in the market were genuine but expensive.

Eight different brands of disposable syringes were found in the medical stores. All were labeled with the company name and country of origin, but five did not have lot numbers and two did not have the year of production on their packages.

IMPROVING A DANGEROUS SYSTEM

This disposal pattern of syringes in Karachi presents numerous dangers. All those who are involved in recycling used syringes are at risk of acquiring blood-borne infections because of frequent needlestick injuries. The reentry of used syringes following cleansing and repackaging likely occurs, at least occasionally. Such recycling and repackaging is of concern because, in some cases, injection providers could give injections with syringes that they identified as new but that had in fact been recycled and repackaged. Although attendants of medical stores thought they were able to identify recycled and repackaged syringes, no clear criteria are available and we were unable ourselves to determine whether the suspicious syringes we obtained had indeed been recycled and repackaged. Thus, it would be all the more difficult for patients and healthcare practitioners to differentiate the repackaged syringes from new ones. Criteria are therefore needed to identify syringes that have been recycled and repackaged so that (1) the penetration of the market by such syringes can be estimated and (2) patients and healthcare workers can be educated to differentiate between a new sterile disposable syringe and a recycled and repackaged syringe.

The World Health Organization suggests that sharps waste management be ensured through (1) a policy framework that states that healthcare systems should manage the waste that they produce as part of their duty of care; (2) the development of a comprehensive system from waste production to waste disposal that includes waste reduction through preventing unnecessary use of sharps; (3) training at all levels; and (4) choice of a waste treatment option that includes incineration and non-incineration technologies.[5,6]

However, each of the waste treatment technologies has limitations. Incineration produces emissions, including persistent organic pollutants in the case of low-temperature incinerators. Non-incineration options (eg, advanced autoclaving or safe burying) do not reduce volumes. These limitations need to be balanced against the health hazards of the absence of sharps waste management when formulating a national policy.

Moreover, sharps waste management has a cost and, unlike recycling, it does not generate funds. Healthcare institutions in Pakistan are overburdened and underfunded. They function in an environment of weak governance. Solutions that require functioning national systems for the management of healthcare waste and increased spending are unlikely to be implemented in the near future.

In Pakistan, as in other low-income countries, the habits of reusing and recycling are an ingrained rational response to scarcity. Alternatives for the management of healthcare waste that recognize the strong economic incentives that drive recycling are more likely to be successful. Potential options include safe removal of needles and associated decontamination of syringes for the purpose of plastic recycling. Such an approach could continue to support the plastics recycling industry and the low-skill workers who depend on its income. Additionally, the problems from healthcare waste can by minimized by limiting procedures that generate waste.

Syringe recycling occurs primarily in the plasticware industry in Pakistan, but some used syringes are cleaned and sold again as new. Individuals who handle the used syringes, as well as patients who buy "recycled" syringes, are at high risk of infection with blood-borne pathogens. The use of new disposable injection equipment should be promoted in Pakistan. However, interventions to reduce the handling of sharp medical waste and to ensure the quality and safety of injection equipment should be developed and evaluated.

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