

A Comparison of Infection Control Practices in Pathology Laboratories of Government-Teaching Hospitals and Private Sector in Lahore

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A questionnaire study was designed to collect and compare information obtained from workers in six government-teaching hospital laboratories (GTH-Labs) and thirteen private sector laboratories (PS-Labs) in Lahore area. Two aspects of laboratory safety were studied Infection control (IC) practices and presence of commonly used items of infection control. Results revealed that of IC practices, hand washing before blood collection from the patient was the least popular IC ritual with workers from only one PS-Lab practicing it. Wearing of gloves before blood collection from the patient was practiced more often, again by workers in the private sector laboratories. Hand washing after sample collection was the most practiced IC ritual with workers in half of the laboratories in both sectors practicing it. Similarly syringe-needle crushing after drawing of blood was practiced in about half the laboratories. As for the presence and usage of a common surface disinfectant, more than 50% laboratories in both sectors were without even a single disinfectant. Verification for items of Infection control revealed that with the exception of gloves, none of the laboratories in both sectors were fully equipped with the remaining four common items (eye goggles, eye irrigation solution, plastic aprons & first aid kit). In conclusion, laboratories in both sectors need to be equipped with at least the basic items of Infection control. There is no uniformity about Infection control practices in pathology laboratories in both sectors. The most important practice of hand washing is a neglected aspect in our laboratories and workers should be trained to wash hands using defined method of hand washing before and after taking sample from the patient. There is an urgent need to have standard set of safety regulations applicable to all pathology laboratories for worker and patient safety.

Key words Infection control, infection control practices, pathology laboratories.

Health care workers in pathology laboratories are a special risk group for acquiring occupational infections. This risk can certainly be minimized if the laboratories have a safe working environment, access to items of infection control and proper training of their use. In one of our recent surveys, we observed that there are many shortfalls in the background knowledge of laboratory staff about such risks. The current study was designed to compare infection control practices and the facilities provided by the employers in government-teaching hospitals and private laboratories.

Material & methods

This was a questionnaire-format study based on the information obtained from medical staff and laboratory technicians working in 6 major GTH and 13 PS-Labs in Lahore area. From each laboratory 2-3 workers were individually interviewed. The interviews were conducted during morning hours for GTH-Labs and in the afternoon or evening for PS-Labs. Availability of items was personally verified.

Five IC practices selected for comparison were:

1. Frequency of Glove-usage for blood collection
2. Hand washing practice before blood collection from patient
3. Hand washing practice after blood collection
4. Practice of Safe disposal of syringe/needle after blood collection &
5. Frequency of Disinfectant-usage in laboratory areas

Five items of personal safety that were checked for presence in the laboratory areas included:

- a. Gloves
- b. Plastic aprons
- c. Eye visors/goggles
- d. Eye irrigation solution
- e. First aid kit

Results:

Comparison of infection control practices:

- a. On usage of gloves for blood collection, phlebotomists working in 7/13 (54%) PS-Labs were wearing the gloves before taking blood samples whereas workers in only 1/6 (17%) GTH-Labs were doing so. In 4/6 GTH-Labs (66%), gloves were not present in the blood collection area and hence not used for this purpose in the laboratory although they were available for other microbiological work. In PS-Labs, gloves were not present in blood collection area in 4/13 laboratories (30%) (Table 1A).
- b. While comparing hand washing practices for blood collection, none of the workers in 6/6 GTH-Labs washed their hands before taking blood whereas phlebotomists in one PS-Lab did wash their hands prior to taking blood from patients (Table 1B).
- c. Hand washing practice after sample collection was practiced by workers in 4/6 (66%) GTH- and 6/13 (46%) PS-Labs (Table 1B).

- d. As for practice of disposal of needle / syringe, 4/6 (66%) GTH-Labs and 4/13 (31%) PS-Labs were doing so by needle crushing equipment whereas professional waste disposal facilities was used by 1/13 PS-Lab (Table 1C). When asked about the fate of such infectious waste, 83% staff in GTH- and 69% in PS-Labs did not know what happened to the waste they generated. Sixteen percent staff in former and 69% in later category said it was burnt.
- e. At least one type of surface disinfectant was present in 4/6 (66%) GTH-and 7/13 (53%) PS-Labs (Table 1D).

Table 1: Comparison of Infection Control Practices in GTH- and PS-Laboratories

A: Glove usage for blood collection

Practice	GTH-Labs (%) n=6	PS-Labs (%) n=13
Gloves present; regularly used for blood collection	17% (1/6)	54% (7/13)
Gloves present; infrequently used for blood collection	0%	08% (1/13)
Gloves not present	66% (4/6)	30% (4/13)
Information withheld or access denied	17% (1/6)	08% (1/13)

B: Hand washing practices for blood collection

Practice	GTH-Labs (%) n=6	PS-Labs (%) n=13
Wash hands before blood collection	-	08%(1/13)
Wash hands after blood collection	66%(4/6)	46%(6/13)
Reluctant to wash hands	17%(1/6)	30%(4/13)
Information withheld or access denied	17%(1/6)	15%(2/13)

C: Practice of Needle Cutting after blood collection

Presence of needle cutter	GTH-Labs (%) n=6	PS-Labs (%) n=13
Yes; presence verifiable	66%(4/6)	31%(4/13)
Yes; presence not verified	-	54%(7/13)
Not present	33%(2/6)	-
Waste disposal system used	-	07%(1/13)
Information withheld or access denied	-	07%(1/13)

D: Usage of Surface Disinfectant

Surface Disinfectant	GTH-Labs (%) n=6	PS-Labs (%) n=13
Present	66%(4/6)	53%(7/13)
Absent	33%(2/6)	46%(6/13)

Comparison of presence of IC items:

Gloves were present in all laboratories visited in both the GTH- and PS-Labs except one major GTH-Lab where gloves were not available for use (Table 2). Plastic aprons were present in 21% of PS-Labs but were not available in

any GTH-Lab. Eye goggles were present in one GTH-Lab and eye irrigation solution was present in three laboratories altogether - 2/13 in PS- (15%) and 1/6 in GTH-Labs (16%). The first aid kit was present in 50% of GTH- and 53% of PS-Labs (Table 2).

Table 2: Comparison of availability of infection control items in GTH- and PS-Laboratories

Infection Control Item	Presence of Item in GTH-Labs (%) n=6	Presence of Item in PS-Labs (%) n=13
Gloves	83%(5/6)	100%(13/13)
Plastic aprons	0%	21%(3/13)
Eye visors	16%(1/6)	0%
Eye irrigation sol	16%(1/6)	15%(2/13)
First aid kit	50%(3/6)	53%(7/13)

Discussion

Several studies have shown that the annual incidence of laboratory-acquired infections is between 1-5 per 1000 employees with considerable morbidity and mortality^{2,3}. This incidence is recorded for workers in hospitals in North America and other developed countries, where there is an established infection control service (ICS). In our local setup where ICS hardly exists and the laboratory workers do not even practice "Universal precautions"⁴, we can assume that the incidence of laboratory-acquired infections would be higher. Added to this, if workers are unaware of common IC practices and laboratories are not well equipped with items of IC, laboratory acquired infections can be a significant problem.

Our study has shown that besides gloves, other items of infection control like eye goggles, eye irrigation solution, plastic aprons and first aid kit are not present in majority of GTH- and PS-Labs visited. In fact, absence of protective gloves in one GTH-Lab was worrisome because the sample workload is high in these places and there is more chance of exposure of the workers and students to infectious agents. IC items like gloves effectively reduce the transmission rate of infectious agents in a needle-stick scenario and are an absolute minimum for a pathology laboratory undertaking phlebotomies and diagnostic work. Besides preventing gross contamination of hands while coming in contact with blood, body fluids and other secretions from the patient^{5,6} gloves usage is mandatory to reduce risk of exposure to blood borne pathogens (Occupational safety and health administration; OSHA Blood borne pathogens final rule)⁷. Similarly plastic aprons contain splashes of blood and chemicals and prevent accidental soakage of under clothes. For all IC items, it was observed that the PS-Labs were better equipped compared with GTH-Labs.

Hand washing was found to be the most neglected area in IC practices in both sectors. Except in one PS-Lab, none of the workers washed their hands before taking blood sample from the patient although about half of them did wear gloves for performing this task. The perception

was that if gloves were worn then there was no need to wash hands. None of the laboratory workers knew how to wash hands using "Defined hand washing technique"⁴ (results not shown). Some workers were honest to admit that they felt reluctant to wash hands. The other alarming observation in our study was the complete absence of a common surface disinfectant in 33% GTH- and 46% PS-Labs. None of the workers could name a simple surface disinfectant that would be effective in cleaning up an accidental blood spillage in laboratory. This mindset must be changed by offering counseling service to laboratory workers for change in practice and retraining in aspects of personal and job safety along with provision of basic items of IC.

The other IC practice about which information was collected from workers was that of needle crushing or shearing in our laboratories. Although practiced in 66% GTH- and 31% PS-Labs surveyed in this study, it is not an ideal way to dispose of contaminated needles and syringes. This practice has been promoted in our laboratories with the view to discourage recycling of contaminated needle/syringes. Because of the chance of sustaining an injury with contaminated needles by the worker during the cutting process, this practice is not considered safe. Instead "sharps containers" or "cinbins" destined for incineration, should be used in laboratory areas⁸. In this survey only one PS-Lab was disposing of its contaminated waste including contaminated needles through private sector uplifting for incineration. It was interesting to note that 69% workers in PS- and 30% in GTH-Labs did not know what happened to the contaminated waste they generated. The problem of medical waste disposal needs to be addressed urgently at the official level and guidelines should be provided to the

employers so that the lab workers and general public are safeguarded against such injuries.

In conclusion, both GTH- and PS-Labs under study are not equipped with even basic safety devices or items of Infection control. In addition, laboratory workers at both these sites do not have proper training in Infection control practices and are at risk of acquiring laboratory infections due to unsafe habits and lack of knowledge.

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