Laboratory safety

Cod: 0978

IMPLEMENTATION OF ENVIRONMENTAL HEALTH & SAFETY (EHS) GUIDELINES IN CLINICAL DIAGNOSTICS LABORATORIES IN INDIA

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BACKGROUND: SRL Limited, one of the largest pathology networks in India made a policy decision to align the organization with international performance standards of EHS (Environmental Health & Safety) in definitive agreement with International Finance Corporation, a member institution of World Bank group w.e.f June 2012, for quality improvement in laboratory safety as compliance to occupational health and safety was found lacking amongst laboratories based on outcome of frequent audits.

METHODS: Numerous initiatives like SOPs, formats, materials-First Aid Box, Fire safety kit, signages, Hepatitis B vaccination were undertaken under the guidance of Quality Manager at Head office in Mumbai with a designated EHS officer at each laboratory for project implementation. Regular live online trainings using special browser based software from Unirow and fire evacuation mock drills were done for implementation across widespread laboratories. After about 9 months, internal audit using checklist based on EHS guidelines was conducted for compliance verification.

RESULTS: Pre-implementation compliance was 10% General Safety, 15% Occupational Health & Safety, 30% for biomedical waste and 20% incident and accident documentation. Post- implementation, compliance improved significantly upto 70% General Safety, 92% Occupational Health & Safety and BMW documentation and 94% documentation of incidents and accidents, however compliance for chemical liquid waste disposal remained poor across all laboratories. Corrective actions for non-conformances raised in compliance audits were taken.

CONCLUSIONS: The awareness on safe practices and environmental safety was widely acknowledged helping to achieve standardization across laboratories. However, the problem faced was in disposal of hazardous liquid chemical waste generated in histopathology laboratories e.g. xylene, formalin and alcohol down the sink contaminating water and soil.These liquids being inflammable, ecotoxic, and carcinogenic are a major hazard to health and environment. This calls for awareness and strict guidelines by accreditation bodies and pollution control boards for disposal by recommended methods for healthy environment. Global and good practices need to be understood to being the change.

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FIRST AID FOR INJURIES CAUSED IN MEDICAL LABORATORIES

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BACKGROUND: Under the Law on health and safety at work of the Republic of Serbia, the employer is required to provide first aid, to provide training for employees and ensure the use of resources and personal protective equipment at work. Injuries that occur may be caused by infectious biological materials, chemical or physical agents.

METHODS: During working hours are specially processed ways of injury and injury care of laboratory workers, as well as the process of providing emergency assistance for patients injury in the laboratory, with practical description of the methods and procedures.

RESULTS: First aid is the obligation of any health care worker who happened to be near to the injured, while emergency medical care provide qualified health professional. The main groups of injuries may be: injuries related to the process of venipuncture (collapse, clonic-tonic convulsions, epileptic seizure), airway injuries, skin and soft tissues injuries (acids, alkalis, animal bites, the effect of electricity) and eye injuries. For each of these types of injuries in the work describes their occurrence, process of care, as well as the necessary resources to provide them. It was proposed that each laboratory has a complete for first aid providing with the following content: rubber gloves, gauze, bandages, plasters, scissors, one M $NaHCO_3$, Ac. Borici 3%, amp. of Vitamin C, amp. of atropine 1%, saline, disinfectants, vaseline gauze, amp. of aminophylina, amp. of amyl nitrate, amp. of diazepam, amp. of flormidal, amp. of corticosteroids, sol. tetracaine 0.5% and apparatus for oxygen with a mask.

CONCLUSIONS: Injuries which occur in laboratories require rapid intervention by employees or professional staff.Of particular importance is educating of laboratory employees how to provide first aid for injuries incurred by patients, such as injuries of the employees in the laboratory. It is necessary to ensure an adequate resources to enable the provision of rapid and an adequate medical assistance at the moment of an accident.

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SIGNIFICANT REDUCTION IN NEEDLES STICK INJURIES THROUGH THE INTRODUCTION OF THE BD PUSH BUTTON BLOOD COLLECTION SET, THE EXPERIENCE OF TWO EU HOSPITALS

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BACKGROUND: Healthcare workers (HCW) who collect blood are at risk of sustaining needlestick injuries (NSI). The European Union estimates that one million such injuries occur in Europe annually. The 2011 EPINet Surveillance Project reported that approximately 13% of all NSI arise from blood collection procedures and that 60% of injuries occur after device usage. Further data from the USA Center for Disease Control (CDC) shows that 39% of deaths that were attributed to a NSI were amongst Medical Technicians. The number of NSI can be reduced by the use of safety devices that cover the needle after use. There are different designs of safety devices available. The safety feature of the device in this study is activated while the needle is still in the patient's vein, ensuring that the needle is made safe immediately after collection. The objectives of this evaluation were to study the effect of the introduction of the BD Vacutainer® Push Button Blood Collection Set (BD PBBCS) on NSI in HCW in a hospital setting and to determine how acceptable the device function was to HCW.

METHODS and RESULTS: At 2 institutions (Paris, France & Seville, Spain), the number of NSI using a first generation safety device and the number used in the year prior to the introduction of the BD PBBCS were used to calculate a baseline NSI rate per 100,000 devices. The sites were then trained in the use of the BD PBBCS then had a familiarization period of use. An NSI rate per 100,000 devices was calculated for the BD PBBCS based on a 6 month usage. Towards the end of the 6 months HCW were asked to complete a questionnaire about the effectiveness and ease of use of the BD PBBCS. In the year prior to the introduction of the BD PBBCS, 322,000 devices were used. During the 6 months the BD PBBCS were in use, 196,000 were used. At one institution the NSI rate reduced from 8.4 to 3.4, at the other from 2.8 to 1.8. When questioned 73% and 99% of the HCW in the 2 institutions believed that, "Exposure to a contaminated sharp was minimised".

CONCLUSIONS: Overall the NSI rate across the 2 sites was reduced by 50% when the second generation safety device, the BD Vacutainer® Push Button Blood Collection Set was introduced. HCW believed that the devices significantly reduced the exposure to a contaminated sharp.

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EVALUATION OF MYCOBACTERICIDAL ACTIVITY OF DISINFECTANTS

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BACKGROUND: In recent years there has been an increase of nosocomial infections by mycobacteria. Among the measures of control infections in hospitals and clinical laboratories are selecting and using correct of biocidal chemicals with antimycobacterial activity with low toxicity and activity in less time.

METHODS: The high concentration of lipids in the cell wall of Mycobacterium in comparison with other bacteria has been done more resistant to the action of disinfectants, temperature and ultraviolet light. In our country there are few studies on the percentage of resistance presented by the biocides against mycobacteria. We evaluated and compared the mycobactericidal activity of the ethanol 95%, ethanol 70%, glutaraldehyde 2%, phenol 5% and sodium hypochlorite 2,5%. It was assessed by the method of dilution-neutralization UNE-EN 14348 against clinical isolates of mycobacteria.

RESULTS: The study revealed the activity of the biocides used from 30 seconds to 15 minutes. We show that less toxic biocides such as ethanol at a concentration from 70% to 95% cause growth inhibition of 100% of mycobacteria from 30 seconds of exposure. These results are comparable to phenol 5%, glutaraldehyde 2% and hypochlorite 2.5%, some of which are highly toxic to people who use it.

CONCLUSIONS: From the results we can conclude and recommend the use of ethanol as an effective biocide for use in laboratories and hospital environments in contact with mycobacteria.