BLOOD BORNE PATHOGEN AND WRIST MANAGEMENT

INTRODUCTION

The transmission of blood-borne pathogens in the health-care setting has become a matter of increasing public interest and concern over the past number of years. There have been several reports of health-care workers (HCWs) infected with blood-borne pathogens, who had been involved in exposure-prone procedures. There have also been reports of infections being transmitted due to contaminated equipment. A pathogen or infectious agent is a biological agent that causes disease or illness to its host. The term is most often used for agents that disrupt the normal physiology of a multi-cellular animal or plant. However, pathogens can infect unicellular organisms from all of the biological kingdoms.

There are several substrates and pathways whereby pathogens can invade a host. The human body contains many natural defenses against some of common pathogens in the form of the human immune system and by some "helpful" bacteria present in the human body's normal flora. Some pathogens have been found to be responsible for massive amounts of casualties and have had numerous effects on afflicted groups. Today, while many medical advances have been made to safeguard against infection by pathogens, through the use of vaccination, antibiotics and fungicide, pathogens continue to threaten human life. Social advances such as food safety, hygiene, and water treatment have reduced the threat from some pathogens.

On the hand, arm the wrist is a complex set of bones connecting the lower with the hand. It provides considerable movement of the hand. The wrist allows the hand to rotate up and down. It also allows the wrist to rotate side to side. The wrist consists of 8 bones called carpal bones arranged in a complex pattern. The carpal bones interconnect the metacarpal bones of the hand with the radius and ulna bones of the forearm. The mass that results from these bones is called the carpus. The carpus is rounded on its proximal end, where it articulates with the ulna and radius at the wrist. The carpus is slightly

concave on the palmar side, forming a canal known as the carpal tunnel through which tendons, ligaments, and nerves extend into the palm. Its distal surface articulates with the metacarpal bones, which are joined to the carpus by the palmar carpometacarpal ligaments.

THE SPREAD OF BLOODBORNE PATHOGENS

Blood borne pathogens, such as bacteria and viruses, are present in blood and body fluids and can cause disease in humans. The blood borne pathogens of primary concern are hepatitis B, hepatitis C and HIV. These diseases and other blood borne pathogens are spread primarily through:

1. Direct contact: Infected blood or body fluid from one person enters another person's body at a correct entry site, such as infected blood splashing in the eye.
2. Indirect contact: A person's skin touches an object that contains the blood or body fluid of an infected person, such as picking up soiled dressings contaminated with an infected person's blood or body fluid.
3. Respiratory droplet transmission: A person inhales droplets from an infected person, such as through a cough or sneeze.
4. Vector-borne transmission: A person's skin is penetrated by an infectious source, such as an insect bite.

THE RISK OF TRANSMISSION OF HEPATITIS B VIRUS (HBV)

Nature of the risk of transmission

The most efficient method of HBV transmission is by percutaneous exposure to infected blood. Transmission by saliva has been documented only after percutaneous exposure.

Duration of the infection

After acute HBV infection, the outcome of infection can follow one of two courses: most infections in adults (90-95 per cent) are self-limited; symptoms last for up to several weeks are followed by spontaneous recovery and the development of immunity to re-infection within six months. However, between 5 and 10 per cent of adults, and more than 90 per cent of babies who become infected, develop chronic infection with the virus and become carriers. The majority of such persons remain infectious for their lifetimes.

Severity of the infection

Approximately one-third of those infected have no clinical symptoms and are unaware of the infection. A further third of patients show signs of illness and develop symptoms between four and twelve weeks after coming into contact with the virus. Symptoms include loss of appetite, malaise, nausea and influenza. Another third develop more serious symptoms, e.g. vomiting, abdominal pain and jaundice.

THE RISK OF TRANSMISSION OF HEPATITIS C VIRUS (HCV)

HCV was first identified in 1989. Satisfactory tests to identify it were not developed until 1991.Thus; knowledge about the disease at this point in time is not complete.

Nature of the risk of transmission

The major route of transmission in health care is by exposure to infected blood and body fluids.

Duration of the infection

The average incubation period for hepatitis C following infection by a blood transfusion or a needle-stick injury is approximately seven weeks. American studies have shown that the majority of patients with acute HCV infection develop chronic HCV infection with a persistent Viraemia.

Severity of the infection

Among persons with acute HCV infection, 25 per cent or fewer have symptoms of acute hepatitis. It is estimated in US populations that 67 per cent of patients have persistently elevated liver enzymes, 26-50 per cent develops chronic active hepatitis, and depending on the population, 3-26 per cent develops cirrhosis within several years of becoming infected.

THE RISK OF TRANSMISSION OF HUMAN IMMUNODEFICIENCY VIRUS (HIV)

Nature of the risk of transmission

The major risk for transmission of HIV in the health-care setting is associated with percutaneous exposure to blood or blood-containing body fluids contaminated with HIV. Transmission can occur rarely through mucous membranes.

Duration of the infection

Patients are presumed to be infectious early after the onset of HIV infection and to remain infectious for the rest of their lives. Infectivity may be high during the initial period after infection and again as the degree of immunodeficiency worsens.

Severity of the infection

Within several weeks to several months after infection with HIV, many people develop an acute self-limited mononucleosis-like illness lasting a week or two. Infected people may then be free of symptoms for many years before progressing to clinical immunodeficiency. The epidemiology of HIV has changed more recently with the advent of more effective treatment and the longer-term survival has changed markedly since September 1995. Death rates in Europe in 1998 were

less than a fifth of their previous level largely due to new treatment combinations.

PRECAUTIONARY MEASURES

Follow standard precautions to help prevent the spread of blood borne pathogens and other diseases whenever there is a risk of exposure to blood or other body fluids. These precautions require that all blood and other body fluids be treated as if they are infectious. Standard precautions include maintaining personal hygiene and using personal protective equipment (PPE), engineering controls, work practice controls, and proper equipment cleaning and spill cleanup procedures.

GUIDELINES TO PREVENT INFECTION

Some of the guidelines for prevention of blood borne pathogen are as follows:

1. Avoid contact with blood and other body fluids.
2. Use CPR breathing barriers, such as resuscitation masks, when giving ventilations.
3. Wear disposable gloves whenever providing care, particularly if he/she may come into contact with blood or body fluids. Also wear protective coverings, such as a mask, eyewear and a gown, if blood or other body fluids can splash.
4. Cover any cuts, scrapes or sores and remove jewelry, including rings, before wearing disposable gloves.
5. Change gloves before providing care to a different victim.
6. Remove disposable gloves without contacting the soiled part of the gloves and dispose them in a proper container.
7. Thoroughly wash the hands and other areas immediately after providing care. Use alcohol-based hand sanitizer where hand-washing facilities are not available if hands are not visibly soiled.

WRIST MANAGEMENT

The wrist joint is a type of pivot joint moving in relation to the forearm bones, the radius and ulna. However, most of the wrist movement is the result of the carpal bones moving relative to the radius. The head of the radius bone is concave in shape, allowing the carpal bones to rotate and pivot with the end of the bone.

Sections of Wrist Joint

Wrist joint can be classified into the following manner

1. Proximal Wrist Joint
2. Intermediate Wrist Joint.
3. Distal Wrist Joint

1. **Proximal Wrist Joint**

   Proximal Wrist Joint has two segments

   a. First segment is formed by pivot joint between radius and ulna. Head of distal end of ulna is covered with smooth cartilage, which lies against ulnar notch of radius bone.
   b. Second segment is link or joint between distal end of radius and part of ulna with proximal row of three carpal bones

2. **Intermediate wrist joint**

   Intermediate Wrist Joint is link or joint between proximal rows of carpal bones and distal rows of carpal bones. The joint is also known as inter-carpal wrist joint.

3. **Distal wrist joint**

   The distal wrist joint commonly known as distal radioulnar joint is a pivot joint located between bones of the forearm i. e. radius and ulna. This joint is an ellipsoid joint formed by the radius and the articular disc proximally and proximal row of carpal bones distally.

The Function of Wrist Joint

The functions of the wrist joint are as follows:

1. The wrist joint links hand to forearm.
2. Wrist joint supports hand movements like flexion, extension, abduction, adduction, lateral tilt, supination and pronation.
3. Wrist joint protects tendon and nerves.

Wrist Joint Dislocation

Dislocation is a separation of two bones, which are linked to each other. Isolated dislocation of carpal bone is rare, since wrist joint dislocation is often associated with fracture of one of the wrist joint bone.

The causes of wrist joint dislocation.

The wrist joint dislocation is caused by trauma and following are the causes of trauma

1. Automobile accident injury.
2. Work accident.
3. Sport injuries.
4. Domestic fall.
5. Slip and fall on slippery surface.

Symptoms of wrist joint dislocation

Some of the symptoms of wrist joint dislocation are as follows

1. Wrist joint pain.
2. Restricted wrist joint movements.
3. Abnormal sensory symptoms like tingling and numbness.

Treatment for wrist joint dislocation

Treatments are:

1. Conservative treatment
2. Medications
3. Physical therapy
4. Interventional pain therapy
5. Close reduction
6. Surgical treatment

WRIST FRACTURE

A wrist fracture is a medical term for a broken wrist. Although a broken wrist can happen in any of the bones which connect the wrist, by far the most common bone to break is the radius. This is called a distal radius fracture. Fractures that break apart the smooth joint surface or fractures that shatter into many pieces (comminuted fractures) may make the bone unstable. These severe types of fractures often require surgery to restore and hold their alignment. An open fracture occurs when a fragment of bone breaks and is forced out through the skin.

Causes

A wrist fracture occurs from an injury such as falling down onto an outstretched hand. Severe trauma such as car accidents, motorcycle accidents or falls from a ladder cause more severe injuries. Weak bones (for example, in osteoporosis) tend to break more easily.

Signs and symptoms

When the wrist is broken, there is pain and swelling. It can be hard to move or use the hand and wrist. Swelling or a bone out of place can make the wrist appear deformed. There is often pain right around the break and with finger movement. Sometimes the fingers tingle or feel numb at the trips.

Treatment

Treatment depends on many factors, including:

1. Type of fracture, whether it is displaced, unstable or open
2. Age, job, hobbies and activity level.
3. Overall general health
4. Presence of other injuries

Wrist sprain

A sprain is an injury to a ligament. Ligaments are the connective tissues that connect bones to bones; they could be thought of as tape that holds the bones together at a joint. The most common ligament to be injured in the wrist is the scapho-lunate ligament. Sprains can have a wide range of severity; minor sprains may have minimal stretch of the ligaments, and more severe sprains may represent complete tears of the ligament(s).

Causes

Wrist sprains are common when a person falls. The wrist is usually bent backwards when the hand hits the ground.

Signs and symptoms

After injury, the wrist will usually swell and may show bruising. It is usually painful to move.

Treatment

Treatment may range from wearing a splint or cast to surgery. Surgery may consist of arthroscopic or open surgery. Arthroscopic surgery is performed through small (3-4 millimeter) incisions in the skin. A camera and other special instruments are placed inside the wrist to confirm the diagnosis and potentially treat the ligament injury. Some injuries require open surgery, where an incision is made to repair the ligament. A variety of repair methods exist, which could include metal pins, screws, and other specialized devices. Patients are usually placed in a splint or cast that may need to remain on for several weeks after surgery.

CONCLUSION

The risk of transmission of blood-borne pathogens in the health-care setting has become a matter of increasing concern in the recent years. A pathogen or infectious agent is a biological agent that causes disease or illness to its host. The term is most often used for agents that disrupt the normal physiology of a multi-cellular animal or plant. However, pathogens can infect unicellular organisms from all of the biological kingdoms. On the hand, the wrist is a complex set of bones connecting the lower arm with the hand. It provides considerable movement of the hand. The wrist allows the hand to rotate up and down. It also allows the wrist to rotate side to side. The wrist consists of 8 bones called carpal bones arranged in a complex pattern.