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MONKEYPOX: AN OVERVIEW

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Abstract

Monkeypox is caused by monkeypox virus, a member of the Orthopoxvirus genus at intervals the family Poxviridae. Monkeypox is an infective agent animal disease that happens primarily in tropical timberland areas of central and geographic area and is typically exported to different regions. Monkeypox is transmitted to humans through shut contact with Associate in Nursing infected person or animal, or with material different by shut contact with .injury, body fluids, metabolic process droplets and contaminated materials like bedding. Monkeypox is sometimes an ending illness with the symptoms lasting from two to four weeks. Severe cases will occur. In recent times, the case fatality magnitude relation has been around 3–6%. Vaccines used throughout the pox extermination programme conjointly provided protection against monkeypox. Newer vaccines are developed of that one has been approved for hindrance of monkeypox. Associate in Nursing antiviral drug developed for the treatment of pox has conjointly been authorised for the treatment of monkeypox. The clinical presentation of monkeypox be almost like that of pox, a connected orthopoxvirus infection that was declared eradicated worldwide in 1980. Monkeypox is a smaller amount infectiouse or communicable than pox and causes less severe health problem.

Keywords

Monkeypox, orthopox virus, zoonotic, transmission, smallpox, poxviridae

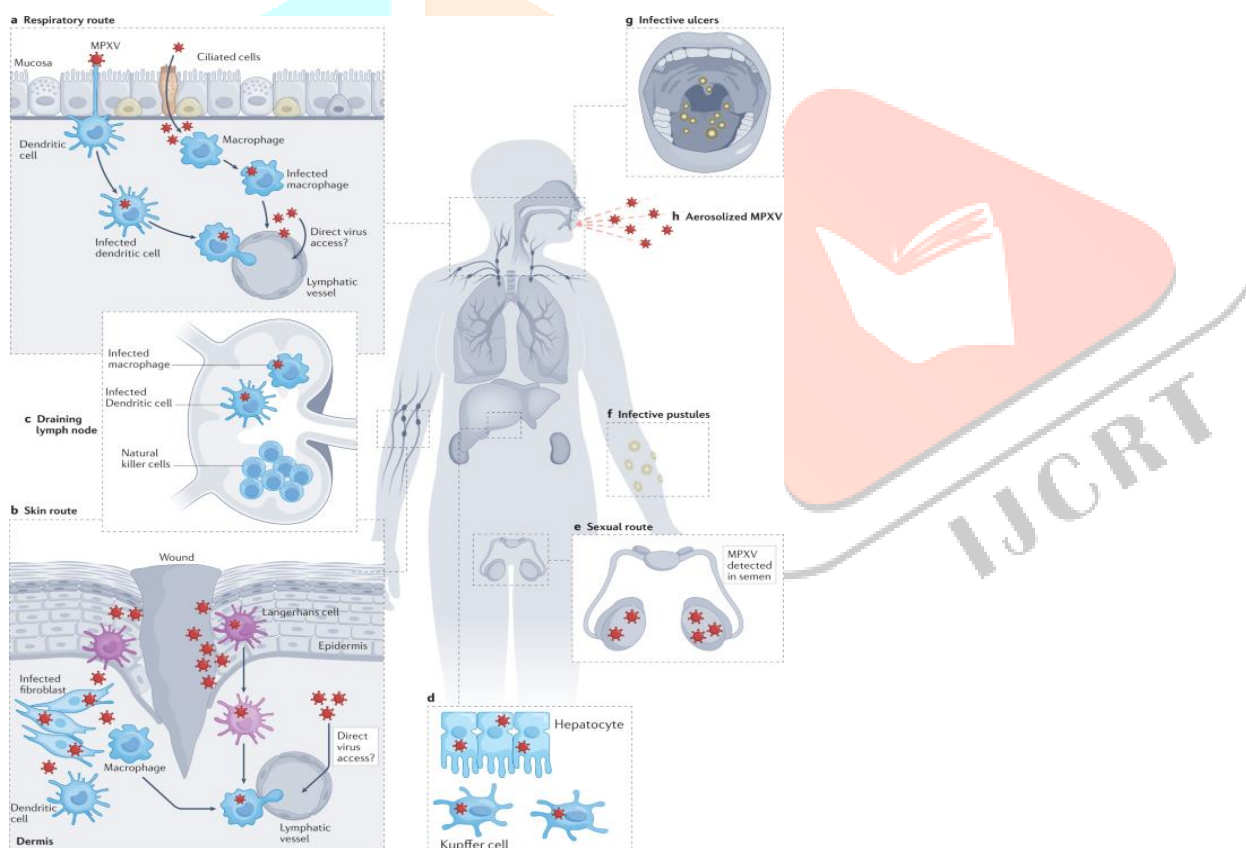
Introduction

Monkeypox usually presents clinically with fever, rash and swollen bodily fluid nodes and will result in a spread of medical complications, new medicine and vaccines are being placed for the treatment and hindrance of monkeypox, and a lot of analysis on the medical specialty, biology, and ecology of the virus in native areas is needed to know and stop any world outbreaks. Monkeypox could be an animal {disease} orthopoxvirus that accidentally causes disease in humans similar to variola. while with considerably lower transitoriness

- Monkeypox could be an infective agent animal disease (a virus transmitted to humans from animals) with symptoms kind of like those seen within the past in variola patients, though it's clinically less severe. With the kill or extermination of variola in 1980 and following termination of variola vaccination, monkeypox has emerged because the most significant orthopoxvirus for public health. Monkeypox primarily happens in central and geographic region, typically in proximity to tropical rainforests, and has been progressively showing in urban areas. Animal hosts embrace a variety of rodents and non-human primates.

Etiology

Monkeypox belongs to the family: Poxviridae, subfamily: chordopoxvirinae, genus: orthopoxvirus, and species: monkeypox virus. On the microscopy, the monkeypox virus is comparatively massive (200 to 250 nanometres). Poxviruses are brick-shaped, encircled by a conjugated protein envelope with a linear double-stranded polymer ordering. except for their dependence on host ribosomes for messenger RNA translation, poxviruses embrace all necessary replication, transcription, assembly, dispersion and egress proteins in their ordering. Monkeypox could be a zoonotic disease and is unfold from animals to humans. The animal. source for the sickness is believed to incorporate squirrels, rats, monkeys, primates, grassland dogs, hedgehogs, pigs, and mice found within the African regions from wherever monkeypox was precedingly and wide reported. the continuing outbreak is, however, primarily driven by human-to-human transmission through metabolism droplets, fomites, Associate in Nursing direct contact with lesions of an infected individual. Recent analysis has found that infectious agent hundreds are high in bodily fluids, together with excreta, saliva, semen, and feces, and in swabs taken from the bodily cavity and body part, planned that sexual transmission could be a major driver of transmission. Monkeypox virus is Associate in Nursing swallowed double-stranded polymer virus that belongs to the Orthopoxvirus genus of the Poxviridae family. There are 2 distinct genetic biological groups of the monkeypox virus: the central African (Congo Basin) biological group and also the west African clade. The Congo Basin biological group has traditionally caused additional severe sickness and was thought to be additional contagious. The geographical division between the 2 clades has to date been within the Cameroon, the sole country wherever each virus clades are established

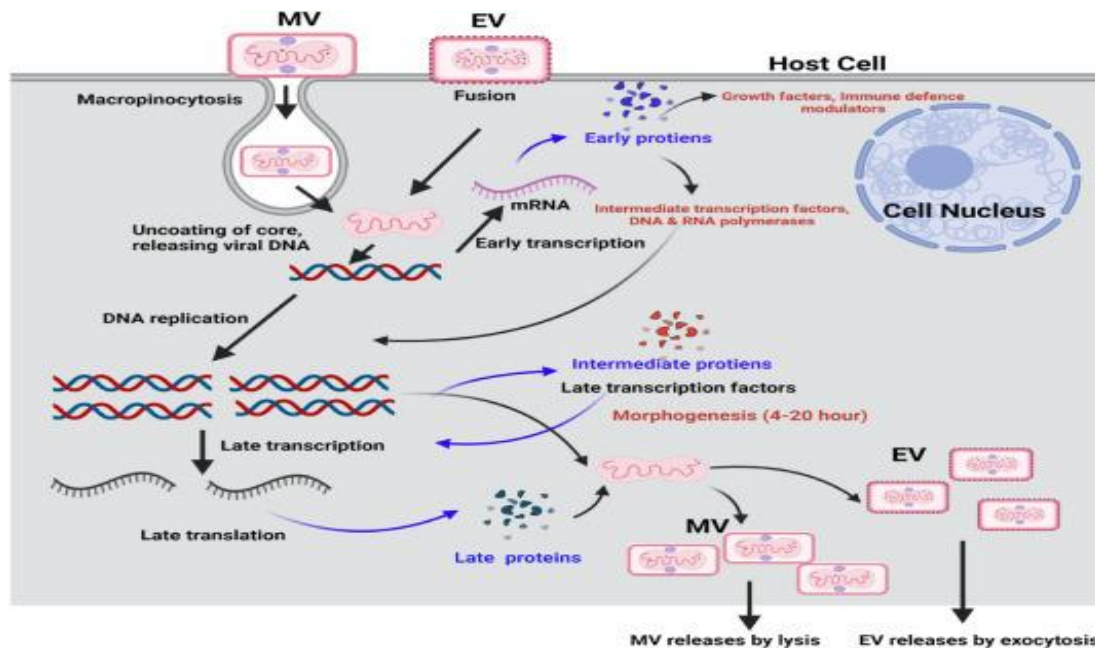


Pathophysiology

Following infective agent entry from any route (oropharynx, cavity, or intradermal), the monkeypox virus replicates at the vaccination website so spreads to native humour nodes. Next, associate initial pathology ends up in infective agent unfold and also the seeding of alternative organs. This represents the time period, generally lasting seven to fourteen days with associate higher limit of twenty-one days.

Symptom onset correlates with a secondary pathology resulting in one to a pair of days of symptom symptoms like fever and pathology before lesions seem. Infected patients could also be contagious at now. Lesions begin within the cavum so seem on the skin. humor antibodies are usually detectable by the time lesions seem.

- the monkeypox virus transmission cycle commences with the virus infecting the metastasis epithelial tissue, once that it spreads through the lymphomatous route to infect the main general organs and replicate there, indicating primary pathology. throughout this stage, very little to no virus was detectable within the blood, as a result of the virus was expeditiously removed by the system of the body. Primary pathology is followed by secondary pathology, which ends up once the virus is free from the infected organs and humor tissues within the blood and reaches the cornified layer of the skin and tissue layer epithelial tissue to allow rise to rash and tissue layer lesions, severally. it's to be additional noted that the severity of the eruption and eruption is basically addicted to a load of particle within the blood throughout secondary pathology.



- Patients with pox infections have lesions that are convergent associated contain a well-endowed quantity of fluid within the sac and pustular phases, that are collected within the hypodermic region so ooze within the crusting part. it's price mentioning that in the transition of those phases, shock could occur because of the depletion of large intravascular volume. Similarly, in patients with monkeypox infection within the U.S., those that according symptoms of tissue layer and epithelial duct problems required volume replacement secondary to epithelial duct fluid loss.] The underlying mechanism for volume repletion is that the movement of fluid from the intravascular compartment to the extravascular compartment thanks to hypoalbuminemia and fluid loss within the alimentary tract, as discovered in general infections. this is often proof that monkeypox infection leads to general compromise, and also the complications aren't restricted to tissue layer and covering surfaces, as is obvious by the clinical presentation of the sickness.

- In associate experimental model, monkeypox virus was gaseous into monkeys and pathology was discovered, once that the virus unfolds to disseminated humour nodes, spleen, thymus, skin, oral membrane, alimentary tract, and also the system through a lymphogenous route.

- While learning the pathophysiology of pox, it absolutely was discovered that people with the foremost dangerous kind of pox-haemorrhagic smallpox were doubtless to possess disseminated intravascular natural process. However, a pair of U.S. patients from the monkeypox irruption, United Nations agency were according to possess haemorrhagic pustules, had no proof of disseminated intravascular natural process, however delicate blood disorder was noted.

Transmission

The virus will unfold each from animal to human and from human to human. Infection from associate degreeimal to human will occur via associate degree animal bite or by direct contact with an infected animal's bodily fluids. The virus will unfold from human to human by each direct contact with the infectious rash, scabs, or body fluids, or indirectly by touching things (such as vesture or linens) that antecedently touched the infectious rash or body fluids or by metabolic process secretions throughout prolonged, face-to-face contact, or throughout intimate physical contact, like fondling, cuddling, or sex. Pregnant girls will unfold the virus to their craniate through the placenta.

The period is between ten and fourteen days. prodromic symptoms embrace swelling of liquid body substance nodes, muscle pain, headache, fever, before the emergence of the rash. Animal-to-human (zoonotic) transmission will occur from direct contact with the blood, bodily fluids, or body covering or tissue layer lesions of infected animals. In Africa, proof of monkeypox infection has been found in several animals as well as rope squirrels, tree squirrels, Gambian sac rats, dormice, totally different species of monkeys et al. The natural reservoir of monkeypox has not nonetheless been known, although rodents square measure the foremost possible. intake inadequately poached meat and different animal product of infected animals could be a potential risk issue. folks living in or close to wooded areas could have indirect or low-level exposure to infected animals.

Human-to-human transmission may result from shut contact with metabolic process secretions, skin lesions of associate degree infected person or recently contaminated objects. Transmission via drop metabolic process particles sometimes needs prolonged face-to-face contact, that puts medical experts, house members and different shut contacts of active cases at bigger risk. However, the longest documented chain of transmission in an exceedingly community has up in recent years from vi to nine sequential person-to-person infections. this might replicate declining immunity altogether communities because of surcease of pox vaccination. Transmission occurs via the placenta from mother to craniate (which can cause innate monkeypox) or throughout shut contact throughout and once birth. whereas shut physical contact could be a well-known risk issue for transmission, it's unclear at now if monkeypox may be transmitted specifically through sexual transmission routes. Studies square measure required to raised perceive this risk. An outbreak of an illness referred to as monkeypox is presently happening in several countries that don't generally have cases. this may be regarding, particularly for folks whose idolized ones or community are affected. Some cases are known through sexual health clinics in communities of gay, bisexual and different men agency get it on with men. It is necessary to notice that the chance of monkeypox isn't restricted to men UN agency get it on with men. Anyone UN agency has shut contact with somebody UN agency is infectious is in danger. However, provided that the virus is being known in these communities, learning regarding monkeypox can facilitate make sure that as few folks as potential square measure affected which the eruption may be stopped.

Public health advice on monkeypox for gay, bisexual and other men who have sex with men

Updated 18 July 2022

An outbreak of a viral infection called monkeypox is currently being reported in countries that have not previously had cases. Anyone who has close contact with someone who is infectious is at risk. Cases have been identified in communities of gay, bisexual and other men who have sex with men who have had recent sexual contact with a new partner or partners; but the risk is not limited to these groups.


We know that this outbreak is concerning, especially for people who are unsure their partners, families and communities. Learning more about monkeypox can help people protect themselves and help stop its onward spread to others. Know your risk to lower your risk.

How to use this document:
The advice in this document is intended for use by individuals, community leaders, influencers, health workers and others affected by or working on the monkeypox outbreak. It contains information to help people reduce their risk of monkeypox and to help slow the spread of the virus.

Information about monkeypox is evolving rapidly. Advice may change as we learn more. Check [who.int](https://www.who.int) for the most up to date information.

What you need to know about monkeypox:

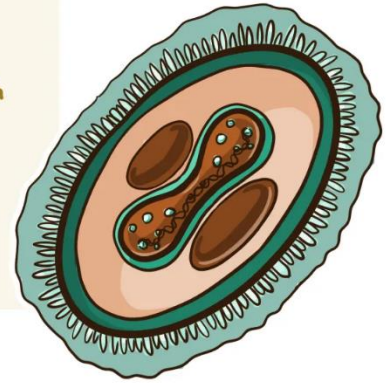
<p>Symptoms:</p> <p>If you are exposed to someone with monkeypox you could develop symptoms up to 21 days later.</p> <p>Most people with monkeypox will get a rash. It can look like pimples/blisters and may be painful and itchy. The rash can be found anywhere on the body, but is often found around the genital and anal region, and on the face, palms of hands and soles of feet. It can also be found inside the mouth, throat, vagina and anus. Some people will have one or two lesions, while others can have several thousand. The rash remains infectious until it has crusted over, the scabs have fallen off and a new layer of skin formed underneath. This can take several weeks, during which you should isolate to protect others. Other symptoms can include:</p> <ul style="list-style-type: none"> - Fever - Swollen lymph nodes - Headaches - Muscle aches - Back pain - Low energy <p>People may experience all or only a few of these symptoms. While some people have mild symptoms, others may develop more serious illness and need care in a health facility. Anyone who has symptoms that could be monkeypox, or who has been in contact with someone who has monkeypox should call or visit a health care provider and seek their advice.</p>	<p>How monkeypox spreads:</p> <p>Monkeypox is spread through close contact (face-to-face, skin-to-skin, mouth-to-mouth and mouth-to-skin) with someone who has monkeypox, including kissing or sexual contact. People are infectious until all their lesions have crusted over, the scabs have fallen off and a new layer of skin has formed underneath.</p> <p>The virus can also spread from contaminated environments to humans, such as when a person with monkeypox touches clothing, bedding, towels, objects, electronics and surfaces. Someone who touches these items can then become infected. It is also possible to become infected from breathing in skin flakes or virus from clothing, bedding or towels.</p> <p>Ulcers, lesions or sores in the mouth can also be infectious, meaning the virus can spread through direct contact with the mouth, respiratory droplets and possibly through short-range aerosols.</p> <p>If you have confirmed or suspected monkeypox:</p> <ul style="list-style-type: none"> - Seek advice from your health care provider and get tested. - Self-isolate and avoid close contact with others (including sex) - Take care of your symptoms and your physical and mental health while you isolate 	<p>You can help to stop this outbreak by:</p> <ul style="list-style-type: none"> - Learning more about how monkeypox is affecting your community - Combating misinformation by sharing only reliable, evidence-based and non-stigmatizing information from trustworthy sources - Staying calm, taking care of your mental health and openly communicating with others <p>Having or being exposed to monkeypox is nothing to be ashamed of.</p> <p>Anyone can get monkeypox. Stigmatizing, blaming or shaming people because of a disease is never ok. Stigma makes it harder to end outbreaks and can stop people from accessing services. Don't allow fear of judgment stop you from seeking the healthcare and social support you need if you have symptoms that could be monkeypox.</p>
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BACKGROUND

* **VIRAL INFECTIOUS DISEASE** that **CAUSES** a **FEBRILE ILLNESS** with **CHARACTERISTIC SKIN RASH & SWOLLEN LYMPH NODES**

- ~ SYMPTOMS SIMILAR to SMALLPOX but **CLINICALLY LESS SEVERE**
- ~ **DISCOVERY** in 1958 with 2 **OUTBREAKS** of **POX-LIKE DISEASE** in **COLONIES** of **MONKEYS KEPT** for **RESEARCH**
- ~ **FIRST HUMAN CASE** REPORTED in **DEMOCRATIC REPUBLIC** of **CONGO** in 1970



CAUSES

- * **INFECTION** with **MONKEYPOX VIRUS**
- ~ **CONTACT** with **INFECTED PERSON** or **ANIMAL**
 - **ROPE SQUIRRELS, TREE SQUIRRELS, GAMBIAN POUCHED RATS, DORMICE, MONKEYS**
 - **CLOSE CONTACT** with **INFECTED SKIN LESIONS**
 - **BODILY FLUIDS**
 - **RESPIRATORY DROPLETS**
 - **CONTAMINATED OBJECTS (CLOTHING, TOWELS, BEDDING)**
 - **MOTHER** to **FETUS** via **PLACENTA** or **DURING/ AFTER** **CHILDBIRTH**



DIAGNOSIS

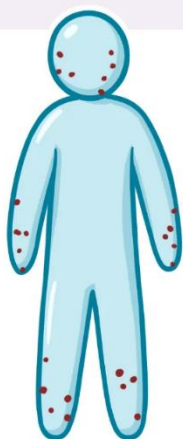
- * **PCR TESTING**
- ~ **ANTIBODY TESTING INCONCLUSIVE**

SIGNS & SYMPTOMS

- * **INCUBATION PERIOD: 6 - 14 DAYS**
- ~ CAN RANGE from 5 - 21 DAYS
- * **INITIAL:**
- ~ **FEBRILE ILLNESS:** **FEVER, CHILLS, INTENSE HEADACHE, SWELLING** of **LYMPH NODES, BACK PAIN, MUSCLE ACHES, LACK** of **ENERGY**
- * **WITHIN 3 DAYS** of **FEVER:**
- ~ **CHARACTERISTIC RASH:** **FLAT RED BASE** that **EVOLVES** into **SLIGHTLY RAISED FIRM LESIONS**
- ~ **LESIONS** **EVENTUALLY CHANGE** to **VESICLES FILLED** with **YELLOW FLUID**, then **CRUST OVER & SLOUGH OFF**

TREATMENT

- * **CURRENTLY NO SPECIFIC TREATMENTS**
- * **SEVERE ILLNESS** or **RISK** of **COMPLICATION:**
- ~ **ANTIVIRALS:** **TECOVIRIMAT (TPOXX), CIDOFOVIR (VISTIDE), BRINCIDOFVIR (TEMBEXA), VACCINIA IMMUNE GLOBULIN INTRAVENOUS (VIGIV)**
- * **SMALLPOX VACCINE**
- ~ **85% PROTECTION** from **GETTING MONKEYPOX**
- ~ **VACCINATION AFTER EXPOSURE** MAY **HELP PREVENT GETTING** or **REDUCE SEVERITY**



CHARACTERISTIC RASH/LESIONS



Signs And Symptoms

The period of time (interval from infection to onset of symptoms) of monkeypox is typically from six to thirteen days however will vary from five to twenty-one days.

The infection is divided into 2 periods:

- the invasion amount (lasts between 0–5 days) characterised by fever, intense headache, pathology (swelling of the humor nodes), back pain, pain (muscle aches) and intense feebleness (lack of energy). pathology may be a grandeur of monkeypox compared to different diseases that will be seem similar (chickenpox, measles, smallpox)
- the eruption typically begins among 1–3 days of look of fever. The rash tends to be additional targeting the face and extremities instead of on the trunk. It affects the face (in ninety fifth of cases), and palms of the hands and soles of the feet (in seventy fifth of cases). additionally affected square measure oral secretion membranes (in seventieth of cases), genitals (30%), and conjunctivae (20%), still because the tissue layer. The rash evolves consecutive from macules (lesions with a flat base) to papules (slightly raised firm lesions), vesicles (lesions crammed with clear fluid), pustules (lesions crammed with xanthous fluid), and crusts that dry up and fall off. the number of lesions varies from a couple of too many thousand. In severe cases, lesions will coalesce till giant sections of skin slough off. Monkeypox is typically an end illness with the symptoms lasting from a pair of to four weeks. Severe cases occur additional usually among kids and square measure associated with the extent of virus exposure, patient health standing and nature of complications. Underlying immune deficiencies could result in worse outcomes. though vaccination against variola major was protecting within the past, these days persons younger than forty to fifty years getting on (depending on the country) could also be additional vulnerable to monkeypox thanks to stop of variola major vaccination campaigns globally once demolition of the illness. Complications of monkeypox will embrace secondary infections, pneumonia, sepsis, cephalitis, and infection of the tissue layer with succeeding loss of vision. The extent to that well infection could occur is unknown.

The case fatality magnitude relation of monkeypox has traditionally ranged from zero to 11 November within the general population and has been higher among young kids. In recent times, the case fatality magnitude relation has been around 3–6%.

Diagnosis

- The clinical medical diagnosis that has got to be thought-about includes different rash sicknesses, like pox, measles, microorganism skin infections, scabies, syphilis, and medication-associated allergies. pathology throughout the symptom stage of ill health will be a clinical feature to differentiate monkeypox from pox or variola.

If monkeypox is suspected, doctors ought to collect Associate in Nursing applicable sample and have it transported safely to a laboratory with applicable capability. Confirmation of monkeypox depends on the sort and quality of the specimen and therefore the style of laboratory takes a look at. Thus, specimens ought to be packaged and shipped in accordance with national and international necessities. enzyme chain reaction (PCR) is that the most well-liked laboratory takes a look at given its accuracy and sensitivity. For this, optimum diagnostic samples for monkeypox square measure from skin lesions – the roof or fluid from vesicles and pustules, and dry crusts. wherever possible, diagnostic test is Associate in Nursing choice. Lesion samples should be hold on in an exceedingly dry, sterile tube (no microorganism transport media) and unbroken cold. PCR blood tests square measure typically inconclusive attributable to the short length of viraemia relative to the temporal order of specimen assortment once symptoms begin and will not be habitually collected from patients.

- As Orth poxviruses square measure serologically cross-reactive, substance and protein detection strategies don't offer monkeypox-specific confirmation. medical science and substance detection strategies square measure thus not suggested for identification or case investigation wherever resources square measure restricted. in addition, recent or remote vaccination with a vaccinia-based immunogen (e.g. anyone unsusceptible before variola destruction, or additional recently unsusceptible thanks to higher risk like orthopoxvirus laboratory personnel) would possibly result in false positive results.

- In order to interpret take a look at results, it's vital that patient data be supplied with the specimens including: a) date of onset of fever, b) date of onset of rash, c) date of specimen assortment, d) current standing of the individual (stage of rash), and e) age

Therapeutics

- Clinical look after monkeypox ought to be absolutely optimized to alleviate symptoms, manage complications and forestall semipermanent sequelae. Patients ought to be offered fluids and food to keep up adequate nutritional standing. Secondary microorganism infections ought to be treated as indicated. Associate in Nursing medication referred to as tecovirimat that was developed for variola was licenced by the Medicines Agency (EMA) for monkeypox in 2022 supported information in animal and human studies. it's not however wide offered.
- If used for patient care, tecovirimat ought to ideally be monitored in a very clinical analysis context with prospective information assortment.

Vaccination

Vaccination against smallpox was incontestable through many empiric studies to be regarding 85% effective in preventing monkeypox. Thus, previous variola major vaccination might end in milder malady. proof of previous vaccination against variola major will typically be found as a scar on the higher arm. At this time, the first (first-generation) variola major vaccines are not any longer on the market to the overall public. Some laboratory personnel or doctors might have received a more modern variola major immunogen to shield them within the event of exposure to Orth poxviruses within the geographic point. A still newer immunogen supported a changed attenuated vaccinia virus (Ankara strain) was approved for the hindrance of monkeypox in 2019. this is often a two-dose immunogen that availableness remains restricted. variola major and monkeypox vaccines area unit developed in formulations supported the vaccinia virus because of cross-protection afforded for the immunologic response to Orth poxviruses



Prevention

- Raising awareness of risk factors and educating folks regarding the measures they will desire cut back exposure to the virus is that the main interference strategy for monkeypox. Scientific studies are currently a foot to assess the feasibility and appropriateness of vaccination for the interference and management of monkeypox. Some countries have, developing, policies to supply immunizing agent to persons WHO is also in danger like laboratory personnel, speedy response groups and physicians.

- It has been documented that those people WHO had received variola major immunizing agent were higher protected against MPX or developed less severe unwellness as compared to those with no history of variola major vaccination. Hence, variola major and fashionable modifications of variola major immunizing agent are suggested for defence against MPX, although the effectivity is unsure and wishes validation. These vaccines are presently not suggested for mass administration. they're suggested for post-exposure prevention ideally at intervals four d/maximally a pair of exposure and for pre-exposure prevention in insecure people as well as health care employees.



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