

HERPES ZOSTER IN IMMUNODEPRESSED PATIENTS.

ABSTRACT: -

Herpes zoster (HZ) is the disease caused when there is again activation of the virus which is in the latent phase. Name of the virus is varicella zoster virus (VZV). This virus remains into the dorsal root ganglia which are the collection of neuronal cell bodies. It is known as the reactivation because it is the secondary infection. The main or the old infection is chickenpox, it generally occurs in early stages of life. This secondary infection is caused in the later stages of life in the old age patients, if the patient is immunocompromised then this type of infections can cause death or make the patient comatose. But in the world, there are many people having variety of common or uncommon signs and symptoms of this disease based on their body, diet, area, or even genetic features.

This Herpes Zoster acts on the immune response called cell mediated immunity and decreases it rapidly with the advance of age of the person. In the coming years the incidences of this disease are gradually increasing because of the weakening of the immune system. The incidences also happened in the people with defective immunity of cell mediated type or due to the abuse of certain drugs.

The herpes zoster is caused to the immunosuppressed patient more quickly than the normal population. As there is no immune system to defend the body, some secondary infections can also be induced in these conditions and may lead to death. This multiple infection can make differential diagnosis.

This is the review made to explain and understand the herpes zoster virus causing different complications in the body and other clinical things related to the immunocompromised patients.

Keywords:- varicella zoster virus, secondary infection, immunosuppressed patients.

WHAT IS HERPES ZOSTER VIRUS?

Herpes zoster virus comes from the family of the Herpesviridae. Where in there is the sub family alphaherpesvirinae. The virus of herpes zoster that is varicella zoster virus is morphologically like the herpes simplex virus. They have the icosahedral shape containing the linear double stranded DNA. These types of viruses do not grow in the lab animals, they need human fibroblast, human amnion, or HeLa cells to grow.[1]

CLINICAL MANIFESTATIONS:

Varicella zoster (chickenpox):

The VZV in the early stages of life i.e., 1-9 years of children causes the chickenpox [2]. The main or the primary infection is common in the children but can be more serious and complicated during adulthood. The disease can come up with many other things such as interstitial pneumonia. The favourable season for the disease to increase is in winter or spring. This can also be the part of the epidemics of the region.[3][4]

The clinical representation of the patient of this disease is:

- 1) Pain in the head
- 2) Discomfort
- 3) Restlessness
- 4) Infective rashes
- 5) Small spots on all over body
- 6) Lesions
- 7) Neurological symptoms in rare cases like meningitis, etc

The lesions of the body contain the high amount of the infective viruses and is highly transmissible with the touch of a person.[5]

herpes zoster:

the HZV in the late stages of life i.e., after 50-55 years of adult causes the reactivation. The HZV starts from the low levels of symptoms like

- 1) normal pain
- 2) irritating skin
- 3) loss of the touch sense(numbness) or
- 4) different weird sensations or
- 5) highly sensitive to feel/touch

high level symptoms:

- 1) postherpetic neuralgia
- 2) VZV vasculopathy
- 3) VZV myelopathy
- 4) retinal necrosis
- 5) zoster sine herpete

The macules are scab in few days and the lesions are not infectious. The dorsal root ganglia and the sensory nerves develops some abnormality and can be seen in the MRI.[6]

EPIDEMIOLOGY OF HERPES ZOSTER IN IMMUNOCOMPROMISED PATIENTS:

In 2014 the report for number of patients of HZV in an year was out and the statistics were

3-5/1000-person year: - North America, Europe, and Asia-Pacific

The herpes zoster can vary from year to year and do not have any specific conditions for these variations.

According to age:

The HZV is generally related to the old age group with low immunity and have some immunocompromised conditions.

The ratio of the incidences occurring in the adulthood to childhood is significant and even increase as the age increases. i.e., 15.5:1 where age of adult is 70-79 years of age.

Gender role:

According to the different articles and surveys, gender affects the number of herpes zoster patients. In those the conclusion was that the females are at higher risk of getting the herpes zoster as compared to males. This is because of the immunity in body of the women becomes weak against the dormant virus present in the body.

Seasonal factor:

There is no particular or great difference in the patients on the change of seasons and the numbers are stable.[7]

VARIOUS RISK FACTORS FOR HERPES ZOSTER:

Tumours:

- Tumours of the lymphoreticular system: Patients with the Hodgkin's disease become immunocompromised because of the treatment. Most of the treatment is radioactive and chemical induced. According to the research Hodgkin's disease is more prone to the causing HZ than the non-Hodgkin's tumour. Whereas it is seen that patients with the tumours of solid mass cannot get HZ. This is because the treatment for such tumours are localized radiations which do not affect the immune system causing the immunosuppression in these patients. The examples for those solid mass tumours are tumour in testis or salivary gland especially parotid. The HZ is more seen / active in the tumours of the breathing organs i.e., lungs
- Tumours of blood related components: the most common blood related tumour is the leukaemia. These patients who are lymphocytic or chronic are more likely to get the HZ than patients with myelocytic or acute tumours

Bone marrow transplantation:

- In the Morden world the treatment of many diseases related to immune system or WBCs can be cured with the help of the bone marrow transplantation. But for that the old bone marrow should be destroyed which should be followed by again formation of the cells. There is the need for immunosuppression of the body for the protection of the new bone marrow and reduce the possibility of rejection of the transplant. So at this time patients become more prone to the disease.

Organ transplant:

- The donor organ is foreign part for the patient and the immune system will reject it, hence the immune system should be suppressed.

Human immunodeficiency virus:

- The HZ is found more in these patients and have very high rate of causing HZ than normal people.

Other:

- When the patient is on the immunosuppressive drugs and skin disease.[8]

CAN COVID-19 INCREASE THE RISK OF THE HERPES ZOSTER:

Herpes (HZ) is related to important morbidity. it's caused by reactivation of the latent varicella-zoster virus (VZV) following a decline in cellular immunity, that is commonly age-related, however that additionally happens in individuals with the illness and / or conditions underneath immunological disorder medical aid. Since coronavirus illness (COVID19), caused by infection with acute metabolic process syndrome coronavirus a pair of (SARSCoV2), has been related to lymphocyte immune disfunction and shingles has been rumoured in COVID19 patients, we tend to conduct a review of the prevailing literature to see if COVID19 will trigger cycle per second. we tend to know twenty-seven cases of post-COVID19 shingles, most ordinarily occurring among twelve weeks of COVID19, and the majority of cases were typical. Atypical manifestations of herpes are noted significantly in patients with blood disease. VZV reactivation has been hypothesized to occur thanks to T-cell disfunction (including blood disease and lymph cell depletion) in COVID19 patients. supported current proof, restricted to case reports and case series, it's impracticable to see whether COVID19 will increase the chance of shingles. Practitioners ought to remember of the doable redoubled risk of herpes throughout an outbreak and take into account prompt treatment and hindrance measures against it. [9]

PATHOGENESIS OF HERPES ZOSTER IN IMMUNOCOMPROMISED PATIENTS

Cutaneous lesions of herpes shingles prove Varicella-zoster virus-specific T-cell proliferation, whereas the assembly of antiviral alfa finally ends up inside the resolution of herpes shingles. In immunocompetent patients, specific antibodies (IgG, IgM, and IgA) seem sooner and reach higher titters throughout reactivation (herpes zoster) than throughout the first infection inflicting durable, enhanced, cell-mediated immunity to the varicella-zoster virus.

The medicine involvement is centripetal and follows a instrument. In most cases, it's the half and cervical roots that square measure concerned, whereas motor involvement is rare. The infection is contagious to people UN agency don't have any previous immunity to varicella-zoster, however, the rates of transmission square measure low. The virus might even be transmitted either via direct skin contact or by snorting infected droplets.[10]

Differential diagnosis:

- 1) Chicken pox
- 2) Cow pox disease
- 3) Bites by the insect
- 4) Inflammation of hair follicles
- 5) Inflammation of cells
- 6) Ulcerative pyoderma of the skin

7) Fungal infections [10]

TREATMENT AND PROGNOSIS OF HERPES ZOSTER IN IMMUNOCOMPROMISED PATIENTS

Antiviral agents

Systemic antiviral medicine will scale back rash seriousness and limit acute pain. However, the decrease in PHN incidence remains beneath debate¹. In the USA, three antiviral medicines are approved for the treatment of HZ: medication, valacyclovir and famciclovir. the employment of those antiviral medicine is usually recommended in patients older than fifty years United Nations agency have cycle while not complications among the primary seventy-two hours of symptom onset to raise treatment profit, and just in case now amount is exceeded, treatment ought to be additionally initiated in those that at the instant of consultation exhibit new lesions, which suggests there's infectious agent replication. opportune use is additionally suggested in seriously upset patients or post-transplantation, even seventy-two hours when symptom onset. within the cases of disseminated shingles, the patient ought to be hospitalized to receive blood vessel treatment with medication. There aren't any contraindications for the employment of those medicine in aged subjects, however doses should be adjusted consistent with directly or indirectly calculated urinary organ function¹. attributable to the convenience of lower range of doses per day (owing to its high availability), less frequency of drug-drug and drug-disease interactions and adverse reactions, the employment of valacyclovir or famciclovir is most well-liked as compared with medication. Treatment choice ought to be additionally influenced by its value. Table two shows antiviral medicine totally different properties. Use of corticosteroids general corticosteroids administered among the primary seventy-two hours of rash onset have incontestable vital profit within the treatment of acute pain, apart from PHN. Their use together with medication has been shown to boost the standard of lifetime of healthy adults older than fifty years with localized cycle, since they decrease pain quicker throughout the acute part and improve interrupted sleep, facilitate patients to come back sooner to their daily activities and need victimization analgesics for shorter time. However, there aren't any variations within the malady evolution vi months when initial rash prevalence. within the presence of rubor or tissue layer inflammation in ophthalmic cycle, ophthalmic together with oral steroids got to be prescribed by the specialist. potential adverse effects got to be thought of once steroids square measure utilized in the elderly: cardiovascular disease, aldohexose intolerance, pathology, and secondary microorganism infection, among others. potential comorbidity gift within the population additionally must be taken under consideration and counsel their use (diabetes mellitus, cardiovascular disease, pathology, glaucoma). Treatment of pain the selection of analgesic treatment for acute hurting or PHN within the aged must take comorbidity, use of alternative medications, and pain severity under consideration. Tylenol ought to be started in patients with gentle pain, either alone or together (if extremely necessary) with some narcotic (codeine or tramadol). the employment of non-steroid medication medicine ought to be restricted to short periods of your time because of their nephrotoxicity and potential duct injury. Adverse effects of either short or long narcotic analgesics embrace temporary state, psychological feature deceleration, nausea, constipation and itching, which can occur additional oftentimes within the elderly⁴⁹. they ought to be used cautiously in patients with addictions. There is square measure totally different choices for

the treatment of pain in PHN attributable to the dearth of response discovered in some cases: antidepressant drug antidepressants, gabapentin, pregabalin and local anaesthetic or chemical irritant patches. antidepressant drug antidepressants are used for the treatment of PHN. the foremost usually used is tricyclic antidepressant drug, though there are reports on the employment of nortriptylin and desimipramine, each the latter with fewer adverse effects. Amitriptyline-associated adverse effects embrace postural hypotension, sedation, xerostomia, retentivity, arrhythmias (A-V block) and medical instrument abnormalities (QT prolongation), that limits its use in aged subjects. Anticonvulsants like gabapentin and pregabalin are rumoured to decrease pain severity in PHN. there's no customary dose for gabapentin, however studies counsel that young patients may be started with a dose of 900 mg/day, with increase to up to 1800 mg/day (in 7-10 days) solely just in case of lack of response. Gabapentin is typically well tolerated by aged patients. Its adverse effects embrace temporary state, symptom and peripheral edema; additionally, it will increase gait and balance alterations in aged patients, particularly in those that square measure frail. Initial dose ought to be 0.5 than that for young patients and will be bit by bit multiplied (dose-response). Pregabalin has few drug interactions, however its use together with benzodiazepines produces symptom, somnolence, issue to concentrate and judgment and thought alterations. In some studies, in young subjects, a dose of 150-600 mg/day has been shown to be efficacious by reducing pain in PHN. terribly cautious use is usually recommended within the aged, since it's terribly similar adverse effects to those of gabapentin; but it offers quicker clinical result than gabapentin. each gabapentin and pregabalin ought to be adjusted in patients with shrivelled urinary organ perform. Topical analgesics square measure usually prescribed for the treatment of PHN. The local anaesthetic patch five-hitter will have analgesic result for PHN lasting up to twelve hours, with gentle or no adverse effects, once it's effective. Topical chemical irritant in zero.025% cream applied up to fourfold daily has been rumoured to be ready to decrease pain, however it's tolerated solely by half-hour of patients attributable to intolerable pain, just like a burn, it should manufacture, that limits its quality. One choice may be the chemical irritant V-day patch formulation, applied for hr, that has been rumoured to decrease pain in up to half-hour of patients with PHN. Combination medical care might have the subsequent advantages: increase of single medications partial response, multiplied rapidness once a medicine that needs time to succeed in effective dose is employed and higher physiological condition at lower doses. However, potential disadvantages of combined medical care in aged patients embrace a rise within the risk for adverse effects with multiplied range of medicines, that even makes it troublesome to grasp that one amongst them is inflicting the adverse effects, additionally to increasing the price of treatment.[11]

Non-pharmacological treatment:

There square measure different choices for the treatment of PHN that also need more study to demonstrate their effectualness. These choices include:

- Invasive techniques, like nerve blocks and native anaesthetics or glucocorticoids intrathecal administration.
- neurolysin group A application.
- Surgery: neural structure electrical stimulation, anterolateral cordotomy and dorsal roots electrocoagulation.

– Others: percutaneous electrical nerve stimulation (TENS), stylostixis, cryotherapy, psychological medical care, transdermal electrical nerve stimulation.[11]

PREVENTIONS OF HERPES ZOSTER IN IMMUNOCOMPROMISED PATIENTS

Herpes shingles and postherpetic pain area unit vaccine preventable. On Gregorian calendar month twenty-three, 2017, the U.S. Food Associate in Nursing Drug Administration approved an adjuvant recombinant VZV vaccine (**Shingrix**) for the bar of shingles. The incidence of herpes shingles in those receiving the vaccine decreased by ninety-six (95% CI, ninetieth to 98%) compared with placebo. it's well tolerated, and since its effectiveness isn't age dependent and doesn't carry the chance of causing herpes shingles, it's been suggested by the consultative Committee on immunisation Practices because the most popular technique of preventing herpes shingles and postherpetic neuralgia. The vaccine is usually recommended for adults fifty years and older, together with those that have already had the live VZV vaccine (Zostavax). it's administered in 2 doses, with the second dose given 2 to 6 months once the primary. Before the arrival of the recombinant VZV vaccine, live VZV vaccine was the suggested immunisation, approved for adults fifty years and older. The Centres for malady management and Prevention's consultative Committee on immunisation Practices had suggested vaccination for adults sixty years and older, notwithstanding whether they had present pox. The live VZV vaccine is contraindicated in immunological disorder persons, those with human immunological disorder viral infection and CD4 white cell counts but two hundred per mm³ (0.20×10^9 per L), patients undergoing cancer treatment, and people with cancer poignant the bones or systema lymphaticum. vaccine effectiveness is sixty-nine within the 1st year, however wanes to four-dimensional within the eighth year; there aren't any recommendations for revaccinating persons UN agency receive the vaccine at sixty years or older.

Although the live VZV vaccine is effective, it's underused, possible partially attributable to the value. price is probably going to be an element within the uptake of the new vaccine, particularly because of it's given in 2 doses rather than one. In 2013, the VZV vaccination rate was solely twenty-four.2% among adults sixty years and older. White adults receive the vaccine at virtually 3 times the speed of blacks and Hispanics. Patient education will increase vaccination rates by serving to patients perceive the advantages and ways in which during which patients is also ready to work with insurance firms to seek out a reasonable means that of getting it.[12-17]

Conclusion:

From this review we Can conclude that the herpes zoster virus have a very high rate in the patients with suppressed immunity. The main age group of people getting the disease is the old age(above 55) The reasons and the diagnosis conclude that the cell mediated immunity played a major role in the prevention of this disease. But the HZV can be treated and prevented with the vaccines.

REFERENCES:

1. Paniker, C. K. J., & Ananthanarayan, R. (1978). *Ananthanarayan and Paniker's textbook of microbiology*. Himayatnagar, Hyderabad: Orient Longman.
2. Finger R, Hughes JP, Meade BJ, et al. Age-specific incidence of chickenpox. *Public Health Rep*. 1994; 109:750–5.
3. Choo PW, Donahue JG, Manson JE, et al. The epidemiology of varicella and its complications. *J Infect Dis*. 1995;172:706–12.
4. Mandal BK, Mukherjee PP, Murphy C, et al. Adult susceptibility to varicella in the tropics is a rural phenomenon due to the lack of previous exposure. *Infect Dis*. 1998;178(Suppl 1):S52–4.
5. Guess HA, Broughton DD, Melton LJ. Population-based studies of varicella complications. *Pediatrics*. 1986;78(Suppl 4):723–7.
6. Carroll WM, Mastaglia FL. Optic neuropathy and ophthalmoplegia in herpes zoster oticus. *Neurology*. 1979;29:726–9.
7. Koshy E, Mengting L, Kumar H, Jianbo W. Epidemiology, treatment and prevention of herpes zoster: A comprehensive review. *Indian J Dermatol Venereol Leprol*. 2018 May-Jun;84(3):251-262. doi: 10.4103/ijdv.IJDVL_1021_16. PMID: 29516900.
8. Mandal B K. Herpes zoster in the immunocompromized populations. *Indian J Dermatol* 2006;51:235-43
9. Diez-Domingo J, Parikh R, Bhavsar AB, Cisneros E, McCormick N, Lecrenier N. Can COVID-19 Increase the Risk of Herpes Zoster? A Narrative Review. *Dermatol Ther (Heidelb)*. 2021 Aug;11(4):1119-1126. doi: 10.1007/s13555-021-00549-1. Epub 2021 May 17. Erratum in: *Dermatol Ther (Heidelb)*. 2021 Jun 15; PMID: 33999370; PMCID: PMC8126597.
10. Nair PA, Patel BC. Herpes Zoster. [Updated 2021 Sep 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-.
11. García-González AI, Rosas-Carrasco O. Herpes zoster (HZ) y neuralgia posherpética (NPH) en el adulto mayor: particularidades en la prevención, el diagnóstico y el tratamiento [Herpes zoster and post-herpetic neuralgia in the elderly: Particularities in prevention, diagnosis, and treatment]. *Gac Med Mex*. 2017 Jan-Feb;153(1):92-101. Spanish. PMID: 28128811.
12. Saguil A, Kane S, Mercado M, Lauters R. Herpes Zoster and Postherpetic Neuralgia: Prevention and Management. *Am Fam Physician*. 2017 Nov 15;96(10):656-663. PMID: 29431387.
13. Bhokardankar, Prashant S., and Bharat Rathir. "Indigenous Wisdom of Ayurvedic Drugs to Treat Urinary Tract Infections." *INTERNATIONAL JOURNAL OF AYURVEDIC MEDICINE* 11, no. 3 (September 2020): 370–77.
14. Goyal, Chanan, Waqar M. Naqvi, and Arti Sahu. "An Atypical Case of Febrile Infection-Related Epilepsy Syndrome Following Acute Encephalitis: Impact of Physiotherapy in Regaining Locomotor Abilities in a Patient with Neuroregression."

PAN AFRICAN MEDICAL JOURNAL 36 (June 17, 2020).
<https://doi.org/10.11604/pamj.2020.36.101.23855>.

15. Selvam, Sinduja, Amar Taksande, Amol Lohakare, and Rewat Meshram. "An Infant with Congenital Cytomegalovirus Infection Presenting with Hypomelanosis of Ito." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 48 (November 30, 2020): 3697–99. <https://doi.org/10.14260/jemds/2020/811>.
16. Taksande, Amar. "Myocardial Dysfunction in SARS-CoV-2 Infection in Infants under 1 Year of Age." WORLD JOURNAL OF PEDIATRICS 16, no. 5 (October 2020): 539. <https://doi.org/10.1007/s12519-020-00384-y>.
17. Wadekar, Abhijit, Yash Gupte, Parth Godhiwala, Swapnil Lahole, Sachin Agrawal, and Sunil Kumar. "Emphysematous Cystitis an Unusual Case of Urinary Tract Infection in Long Standing Rheumatoid Arthritis: A Case Report." MEDICAL SCIENCE 24, no. 105 (October 2020): 2993–96.