

CHICKENPOX OUTBREAK IN A TEENAGER: A CASE REPORT

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Abstract

Chickenpox, also known as varicella, and shingles, also known as herpes zoster, are caused by the varicella zoster virus (VZV), a DNA virus belonging to the herpes virus group. Primary infection with VZV causes chickenpox. Like other herpes viruses, VZV has the capacity to persist in the body as a latent infection after the primary infection has occurred. Shingles results from reactivation of latent infection. Humans are the only known host of VZV.

Chickenpox is an airborne disease which spreads easily through coughing and sneezing by ill individuals or through direct contact with secretions from the rash. I report the case of a 17 years-old Asian girl experiencing chickenpox aiming to increase the awareness of this infection.

Key Words: chickenpox, shingles, rash, itching, personal hygiene, medical care.

Introduction

Chickenpox is a highly contagious disease caused by primary infection with Varicella zoster virus. VZV is structurally and morphologically similar to other herpes viruses but is antigenically different. It has a single serotype. Humans are natural hosts. Chickenpox has been observed in other primates including chimpanzees and gorillas.

Usually it is a self-limiting disease but complications can occur in those with the following risk factors:

1. Immunocompromised
2. Older age
3. Steroid use (can occur even with short courses of oral but not inhaled steroids)
4. Malignancy

It tends to be milder in younger children than in older children and if contracted in adulthood it is significantly more unpleasant.

It is dangerous in neonates and to the fetus if contracted in pregnancy.

The infection tends to be severe in pregnancy, a high risk of pneumonia as well as risks to the fetus. Crude mortality rates from chickenpox are 2-4 per 100,000.

Chicken pox is more severe in the immune-compromised but mortality and severe morbidity are higher in healthy affected individuals.

Varicella is a highly contagious disease of childhood; more than 90% of people in the United States have antibody by age 10 years. Prior to 2001, there were more cases of chickenpox than any other noticeable disease, but the widespread use of the vaccine has significantly reduced the cases. Chickenpox is an airborne disease which spreads easily through coughing and sneezing by ill individuals or through direct contact with secretions from the rash. The infection usually starts with vesicular skin rash mainly on the body and head rather than at the periphery and become itchy, raw pox marks which usually heal without scarring.

A person with chickenpox is infectious one to two days before the rash appears and they remain contagious until all the lesions have crusted over and it takes approximately 6 days. VZV infects the mucosa of the upper respiratory tract and then spreads via blood to the skin, where the typical vesicular rash occurs. The early symptoms in adolescents and adults are nausea, loss of appetite, aching muscles and headache. This is followed by characteristic rash and oral sores, malaise and a low grade fever that signals the presence of disease.

In children the illness is not usually preceded by prodromal symptoms and the first sign is rash or the spots in the oral cavity. The rash begins as the

small red dots on the face, scalp, upper arms and legs progressing over 10-12 hours to small bumps, blisters and pustules followed by formation of scabs. At blister stage intense itching is usually present. Blisters also occur on palms, soles and genital areas. Commonly visible evidence of disease develops in oral cavity and tonsil areas. In the form of small ulcers which can be painful, itchy or both. This internal rash can precede the external rash by 1-3 days or can be concurrent. These symptoms of chickenpox appear 10-21 days after exposure to a contagious person. Adults may have a more widespread rash and longer fever and they are more likely to experience complications such as Varicella pneumonia. In adults pock marks are darker and the scars are more prominent than in children. Chickenpox is rarely fatal although it is more severe in adult men than in women or children. Non-immune pregnant women and those with a suppressed immune system are at highest risk of serious complications. The most common late complication of chickenpox is shingles caused by reactivation of the Varicella zoster virus decades after the initial, often childhood chickenpox infection. Making a diagnosis of chickenpox involves taking a thorough health history, including symptoms and vaccination and performing a physical exam. The diagnosis of Varicella is primarily clinical with typical early prodromal symptoms and then the characteristic rash and oral cavity sores. Confirmation of the diagnosis can be sought either examination of the fluid within the vesicles of rash or by testing blood for evidence of an acute immunologic response. Multinucleated giant cells with intra-nuclear lesions are seen in the base of the lesions.

Laboratory diagnosis of chickenpox is not routinely required but may be useful in special circumstances such as:

1. Cases of atypical clinical presentation, mild or severe.
2. Cases of severe disease.
3. Post-vaccination events, such as;
 - Rash with >50 lesions 7–42 days post-vaccination;
 - Suspected secondary transmission of the vaccine virus;
 - Shingles; and
 - Any serious adverse event (e.g., pneumonia, encephalitis, cerebral ataxia)
4. Clusters of breakthrough chickenpox in vaccinated individuals.
5. Chickenpox re-infection in unvaccinated individuals

Case Report Presentation

A 17 years old girl, 50kg Asian was presented to Rehmat hospital Gujrat, Pakistan. She complains of nausea, loss of appetite, aching muscles and headache accompanied by a pruritic (itchy) rash that evolves from spots (macules) to bumps (papules) to blisters (vesicles), and eventually into dried crusts over 5–6 days. All three types of lesions (macules, papules, and vesicles) were present at the same time, and they tend to be more abundant on covered parts of the body. These papules were also formed on mucosal surfaces such as the mouth and the throat. Doctor confirmed chickenpox on examination of the characteristic rash and examination of the fluid within the vesicles of rash and blood test revealed Varicella zoster virus. Diagnosis was confirmed by positive results for Immunoglobulin M antibodies because VZV appears to stimulate transient Immunoglobulin M production that is inconsistently observed. The vital signs show BP 120/80 mmHg and temperature 38-39 degree C.

The patient got the infection during summer vacations when she went to meet her cousin who was suffering from chickenpox. The symptoms appeared 10 days after exposure to the contagious person.

Doctor prescribed her Vibramycin capsules (100mg/dose, 2 times/day during 5 days) and told her that the condition will resolve by itself within a couple of weeks but meanwhile she must pay attention to her personal hygiene. She was advised to cut her nails short to prevent scratching, to stay at home while she is infectious to avoid spreading of disease to others and clean her body daily with warm water to avoid secondary bacterial infection. She was advised to stay away from her younger brother during infection because during chickenpox VZV can transmit from person to person by the following means:

1. Droplet spread when a person coughs or sneezes
2. Direct contact with upper respiratory secretions or lesions that have not yet crusted over
3. Airborne spread

So she used to spend time at home by reading books and watching TV.

She recovered from infection after 3 weeks.

Discussion

Chickenpox is a highly infectious, acute and febrile disease, affecting a great percentage of people during their lifetime with greater incidence during childhood because of its characteristic rash and

distribution along with epidemiologic information, the diagnosis is mainly clinical. Laboratory diagnosis is facilitated by the accessibility of the virus in superficial skin lesions but it is only justifiable if clinical doubt exists.

Chickenpox has generally a benign course although it can be associated with several complications depending on immune status, presence of chronic diseases and age.

Neurological complications associated with chickenpox are rather uncommon being estimated in 1-3 per 10,000 cases. The expected proportion of neurologic complications among hospitalized children varies between 13.9% and 20.4%.

Sometimes complications are associated with this infection

1. Secondary infection of lesions can occur, probably from scratching. A polish study of children admitted to hospital found that 21% had secondary skin infection.
2. Secondary bacterial infections especially group A streptococcal infection, can produce necrotizing fasciitis and toxic shock syndrome.
3. Viral pneumonia can be life threatening most often in older children and adults, appearing 3 or 4 days after the onset of the rash. Chest pain, wheezing and Tachypnea are all signs.
4. Encephalitis is a serious illness that may require admission to an ICU. Symptoms include confusion, irritability, drowsiness and vomiting. Weakness or inability to walk, severe headache and neck stiffness are also possible features. An English of 204 patients admitted to hospital with encephalitis found that in 5% the causative agent was chickenpox. The mortality rate is 5-10%.
5. Other CNS complications e.g. benign cerebellar ataxia, myelitis, vasculitis causing strokes (may occur several months after the chickenpox)
6. Other infections e.g. Osteomyelitis, sepsis, otitis media.

The treatment includes

1. Anti-itch treatments
2. Warm baths
3. Calamine lotion
4. Avoid scratching blisters
5. Isolation to avoid contagion to others

The treatment of chickenpox also includes measures to help relieve symptoms and keep the body as strong as possible to minimize the risk of developing complications. This includes rest, medications to ease itching, pain and fever and drinking plenty of fluids. Antibiotics are ineffective against the chickenpox. However they may be prescribed for some children or adults who have developed a secondary bacterial

infection.

However the treatment of Chickenpox also include use of Aspirin: Children (<18 years of age) with chickenpox should not receive aspirin or other salicylates because they are associated with an increased risk of Reye syndrome.

Although there have been no formal clinical studies evaluating the effectiveness of topical application of Calamine lotion, a topical barrier preparation containing Zinc oxide and one of most commonly used interventions, it has an excellent safety profile.

Acetaminophen (Paracetamol) but not Aspirin may be used to reduce fever, pain and relieve itching. Sometimes Antivirals (Acyclovir or Valacyclovir) are used. Antihistamine relief itches and is used in cases where itches prevent sleep because they are also sedative. People at risk of developing severe complications who have had significant exposure to virus may be given Intramuscular Varicella zoster Immune Globulin (VZIG), a preparation containing high titers of antibodies to Varicella zoster virus to ward off the disease. Sorivudine, a nucleoside analogue has been reported to be effective in the treatment of primary Varicella in healthy adults. After recovering from chickenpox it is recommended by doctors that adults taken 1 injection of VZV Immune Globulin and 1 injection of Varicella vaccine or herpes zoster vaccine.

More people contracting chickenpox will not need antiviral treatment. However it is important to recognize groups of patients who will benefit from antiviral treatment. Chickenpox and shingles may be treated with antiviral agents such as acyclovir, Famciclovir and Valacyclovir. The decision to use therapy and the duration and route of therapy should be determined by the specific host factors, the extent of infection, and the Initial response to therapy. Oral acyclovir is not recommended for routine use in otherwise healthy children with chickenpox.

Some patients will need referral for Intravenous Aciclovir:

1. High risk patients who are immune-compromised (Haematological malignancy, HIV with CD4<200 cells/mm³, organ transplant, high-dose immunosuppressive treatment).
2. Systemic disease (for example affecting the heart, the lungs).
3. Patients on high-dose steroids (children on more than 2mg/kg/day for more than 14 days, or in adults on 40mg/day for more than a week).
4. New lesions appearing after 8 days.

Oral Aciclovir should be started for 5-7 days (800mg X 5 daily for adults, 20mg/kg up to 800 mg qds for children) in the following:

1. Patients with a chronic medical condition (for example lung or heart disease).
2. Patients over 12 year old age to reduce the complication rate.
3. When the patient is a secondary case in a household.
4. Pregnant patients, although use is not licensed. There is no evidence of teratogenicity.

Latest treatment includes use of Acyclovir, Vidarabine, Famvir and Foscarret.

Alternative treatments or home remedies that have been listed in various sources as possibly beneficial for chickenpox may include

1. Cool baking soda bath
2. Oatmeal bath
3. Cool moist compress
4. Calamine lotion

Clinical trials include

1. Famciclovir oral Pediatric Formulation in children 1-12 year of age with Varicella zoster infection.
2. Use of VZV vaccine to prevent shingles in HIV infected children who have already had chickenpox.
3. The safety and effectiveness of Valacyclovir HCL in the treatment of Varicella zoster infection in HIV-1 infected children.

Conclusion

Poor pharmaceutical services and irrational usage of drug is a major problem of our country but rational therapy help to overcome the disease efficiently. Chickenpox is a highly contagious disease rarely associated with secondary infection. The infection resolves itself by maintaining good hygiene. My report is emphasis on the fact the good pharmaceutical and clinical care decrease the mortality rate associated with rare clinical situations. Moreover; the involvement of drug experts pharmacists also ensure the success and rational therapy.

Recommendations

1. We should assure the standard drug monitoring system including prescription review, dose calculation and therapeutic evaluation.
2. Physicians should update their executed procedures, scientific techniques, chemotherapy protocols, professional skills and clinical expertise.
3. Hospital authority should make sure the availability of clinical pharmaceutical services

round the clock. The pharmacist must have to collect the medical, social, personal and professional data of patient to figure out any possible potential health hazard.

4. The patient and guardian should be briefed about the illness, treatment and possible outcomes if professional ethics have no restriction to do so.
5. The physician should try to keep the patients well treated and happy.
6. Furthermore; in staff meetings the problems and complaints should be discussed for future benefit.
7. Any kind of patient's letter, phone call, email or text message should be bothered and invite for a free consultation. He should be replied promptly with an expression of taking good care of his health.
8. The problems related to non professional behavior, inadequate diagnostic facilities and non- healthy condition in the hospital setting can only be resolved by designing certain rules and regulations.
9. Children with chickenpox should not go to school until the last blister has dried. You should tell your child's school if your child has chickenpox, as other children may need to be immunized or treated.
10. Doctors generally diagnose chickenpox based on the telltale rash. If there's any doubt about the diagnosis, chickenpox

should be confirmed with laboratory tests, including blood tests or a culture of lesion samples.

11. We should admire the role of pharmacist in hospitals.
12. We should maintain hygiene in hospitals.

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