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ANAESTHETIC MANAGEMENT OF A CHILD WITH ACTIVE VARICELLA POSTED FOR EMERGENCY FOREIGN BODY REMOVAL – A CASE REPORT

Anaesthesiology

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ABSTRACT

A 5 year old male child was brought to hospital with complaints of ingestion of one rupee coin. Child is been diagnosed with active Varicella Zoster. Clinical implications and anaesthetic management is been discussed here.

KEYWORDS

Varicella zoster, foreign body, Chicken pox, General Anaesthesia, Total Intravenous Anaesthesia

INTRODUCTION

Varicella zoster virus infection (chicken pox) is a mild, self-limiting disease of childhood caused by Varicella zoster virus (VZV). VZV causes chicken pox as the primary infection and later when VZV reactivates shingles or herpes zoster. Chicken pox is highly contagious and transmitted by respiratory droplets and by direct contact with vesicle fluid. The rash is centripetal, being concentrated on the body rather than the limbs, and the lesions evolve through different stages of evolution evident. We present the case of a 5 year old child with active varicella infection with foreign body lodged in oesophagus posted for foreign body removal.

CASE REPORT

A 5 year old male child was brought to emergency department of our hospital with complaints of ingestion of one rupee coin. On examination, child was found to be haemodynamically stable with Heart Rate 102bpm, Blood Pressure 96/54mmHg, Respiratory Rate 22 cycles/min maintaining saturation of 98% on room air with no signs of difficulty in breathing. Chest X-ray showed a radioopaque foreign body probably a coin present in the upper part of oesophagus. Clinical examination revealed erythematous rashes present all over the body. The rash is centripetal, being concentrated on the body rather than the limbs, and the lesions evolve through papular, vesicular and crusting stages, with lesions at different stages of evolution evident. However, there was no involvement of oral mucosa. There is history of fever for a duration of 2 days before the appearance of rashes. He is been diagnosed with Varicella Zoster undergoing treatment for the same. Chest X-ray showed a radioopaque foreign body probably a coin present in the upper part of oesophagus. Systemic examination and airway was normal with Mallampatti Class 2. After routine blood investigations, child was taken up for surgery after 4 hours of NBM.

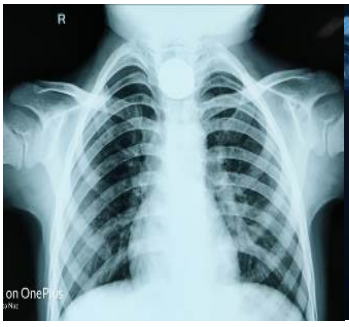

Fig 1

Fig 2

Fig 1: Chest X-ray PA view shows a radioopaque coin shadow present near cricopharyngeal junction. Fig 2: Lateral view of Neck shows a radioopaque object in upper part of oesophagus, behind air column.

Fig 3

Fig 4

Fig 3 & 4: Multiple erythematous varicella rashes of all stages seen concentrated over the truncal region (Fig 3) and face (Fig 4).

Patient was shifted to the operation theatre. Monitors such as ECG, pulse oximeter, Non Invasive Blood Pressure Cuff was connected, baseline vitals recorded. Heat Rate 112bpm, BP 106/56mm Hg, SPO2 98% on room air. Intravenous line secured with 22G iv cannula in dorsum of left hand. General Anaesthesia with endotracheal intubation and intermittent positive pressure ventilation was planned. Child was preoxygenated well with 100% Oxygen for 3minutes, premedicated with iv glycopyrrolate 0.01mg/kg, iv fentanyl 2mcg/kg. Anaesthesia was induced using iv propofol 2mg/kg. Child was intubated with No. 4.5 cuffed endotracheal tube after paralyzing with succinyl choline iv 1.5mg/kg. Anaesthesia was maintained with intermittent doses of propofol with 100% oxygen through out the procedure. Nitrous oxide and volatile inhalational anaesthetic agents was completely avoided. Diclofenac suppository with dose of 2mg/kg was given. After successful removal of foreign body from oesophagus, child was extubated when fully awake with spontaneous respiration generating adequate tidal volume and normal respiratory rate. Intraoperative and postoperative period was uneventful.

DISCUSSION

Varicella Zoster Virus (VZV) also called as "Human (alpha) herpes virus 3" is a double stranded DNA virus, member of the family Herpesviridae. Varicella-zoster virus (VZV) causes two distinct clinical entities: varicella (chickenpox) and herpes zoster (shingles)[1]. Chickenpox is usually a benign illness of childhood characterized by an exanthematous vesicular rash. Inoculation of zoster vesicle fluid into children produces chicken pox, and children who have recovered from zoster virus related infection are resistant to varicella[2]. With reactivation of latent VZV, herpes zoster presents as a dermatomal vesicular rash, associated with severe pain. Humans are the only known reservoir for VZV. Chickenpox is highly contagious, with an attack rate of at least 90% among susceptible (seronegative) individuals. Persons of both sexes and all races are infected equally. Historically, children 5–9 years old are most commonly affected and account for 50% of all cases[1].

Based on conservative estimates, the global annual chickenpox disease burden includes 4 million severe complications leading to hospitalization and 4200 deaths[3]. Factors which influence the proportion of cases among infants, pregnant women and other adults, the prevalence of immunocompromising conditions including HIV infections and the extent of access to care and appropriate treatment. In otherwise healthy children, the disease is usually self-limiting[4].

Primary infection transmission occurs readily by the respiratory route; the localized replication of the virus occurs in the nasopharynx leading to seeding of the lymphatic/reticuloendothelial system and ultimately to the development of viremia. Infection may involve localized blood vessels of the skin, resulting in necrosis and epidermal hemorrhage[1]. Recovery from primary infection is commonly followed by the establishment of latent infection in the cranial nerves, sensory ganglia and spinal dorsal root ganglia, often for decades, without clinical manifestation. When the cell mediated immunity wanes with age or following immune-suppressive therapy, the virus may reactivate, resulting in herpes zoster in about 10-30 percent of persons[5].

The incubation period of chickenpox ranges from 10 to 21 days. Patients are infectious ~48 h before onset of the vesicular rash, during the period of vesicle formation (which generally lasts 4–5 days), and until all vesicles are crusted. Clinically, chickenpox presents as a rash, low-grade fever, and malaise, few patients develop a prodrome 1–2 days before onset of the exanthem. The skin lesions are the hallmark of the infection which include maculopapules, vesicles, and scabs in various stages of evolution. These lesions appear on the trunk and face and rapidly spread to involve other areas of the body. Most are small and have an erythematous base with a diameter of 5–10 mm. Successive crops appear over a 2- to 4-day period. Lesions can also be found on the mucosa of the pharynx and/or the vagina.

Immunocompromised individuals are also at greater risk for visceral complications, which occur in 30–50% of cases and are fatal 15% of the time in the absence of antiviral therapy. The most common infectious complication of varicella is secondary bacterial superinfection of the skin, caused by Streptococcus pyogenes or Staphylococcus aureus[1]. The most common extracutaneous site of involvement in children is the CNS. Acute cerebellar ataxia, encephalitis, aseptic meningitis and Guillain Barre Syndrome have been reported in VZV infections[1].

Varicella pneumonia is the most serious complication following chicken pox. Risk factors for varicella pneumonia are maternal smoking, women in third trimester, skin lesions greater than 100 and presence of pharyngeal lesions[6]. Pneumonia due to VZV usually has its onset 3–5 days into the illness and is associated with tachypnea, cough, dyspnea, and fever. Cyanosis, pleuritic chest pain, and hemoptysis are frequently noted[1]. Roentgenographic evidence of disease consists of nodular infiltrates and interstitial pneumonitis. Resolution of pneumonitis parallels improvement of the skin rash. This is of concern for a patient requiring general anaesthesia.

Other complications of chickenpox include myocarditis, corneal lesions, nephritis, arthritis, bleeding diatheses, acute glomerulonephritis, and hepatitis. Hepatic involvement is generally characterized by elevated levels of liver enzymes, particularly aspartate and alanine aminotr ansferases[1].

A live attenuated varicella vaccine (Oka) is recommended for all children >1 year of age upto 12 years of age who have not had chickenpox and for seronegative. Two doses are recommended for all children: the first at 12–15 months of age and the second at 4–6 years of age. VZV-seronegative persons >13 years of age should receive two doses of vaccine at least 1 month apart. Acyclovir therapy may be of benefit to children <12 years of age if initiated early in the disease (<24 h) at a dose of 20 mg/kg every 6 hr. Valacyclovir is licensed for use in children and adolescents. Good hygiene by daily bathing and soaks with meticulous skin care is important to prevent secondary bacterial infection. Patients with varicella pneumonia often require ventilatory support[1]. Extracorporeal membrane oxygenation may have a role in managing severe varicella pneumonia[7].

The optimal technique of anaesthesia has always been the subject of debate for a patient suffering from chicken pox. The main concern with use of general anaesthesia is postoperative pneumonia. There is an evidence that general anaesthesia produces a decrease in the immune function response. Thus the risk of patient developing varicella pneumonia postoperatively is high. Nitrous oxide, inhalational agents like isoflurane, sevoflurane, desflurane have all been implicated[8]. Thus Total Intravenous Anaesthesia by the use of opioids, muscle relaxants and 100% oxygen was planned for the procedure.

Exposure of medical personnel to an infectious patient is a matter of concern and it should be avoided or minimised. Although previous exposure or infection with VZV is regarded as conferring immunity, second varicella infections are more common than previously thought[9]. The anaesthesiologist and any person handling the infected case must exercise caution. A study to determine age related prevalence of VZV antibodies concluded that a significant proportion of adolescents and adults in India are susceptible to varicella[10]. There are data to indicate that varicella vaccine is effective in preventing illness or modifying severity if used within 3-5 days of exposure[11]. A live attenuated vaccine is routinely recommended for all susceptible health workers for preventing varicella in health care settings. A second approach is to administer varicella-zoster immune globulin (VZIG) to individuals who are at high risk for developing complications of varicella, and have had a significant exposure. This product should be given within 96 h (preferably within 72 h) of the exposure. The efficacy of the varicella vaccine is 70-80% in adult and higher in children[12]. Susceptible pregnant women should be offered the vaccine immediately after delivery and secure contraception is indicated for a minimum of one month after the second dose of vaccination.

Also, neuraxial blockade is not recommended in primary herpes infections because these patients have viraemia. However, it is safe in recurrent herpes infection because viraemia is absent[13]. Gambling & Douglas recommend regional anaesthesia as the preferred choice in a parturient with an acute VZV because of the high risk of varicella pneumonia[14]. However, Camann & Tuomala suggest that regional anaesthesia should be avoided for 2 weeks after the onset of symptoms of varicella because of viraemia[15].

CONCLUSION

The risks and benefits of general anaesthesia as well as regional anaesthesia have to be carefully considered when a patient with active varicella is posted for any surgery. The complications of varicella zoster like varicella pneumonia, bleeding diathesis, hepatitis and myocarditis must be borne in mind and has to be ruled out before anaesthetizing a patient. Also, prophylactic administration of varicella zoster immunoglobulin (VZIG) is strongly recommended to susceptible medical personnel.

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