

Vol 3(2) pp. 5-9 April, 2016
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ISSN: 2985-8828
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Case Report

Respiratory Tract Infection in Infant Orangutan (*Pongo pygmaeus*) at Orang Utan Island, Bukit Merah, Perak, Malaysia

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Received 19 February, 2016; Accepted 30 March, 2016

Abstract

Bukit Merah Orang Utan Island (BMOUI) serves as an *ex-situ* conservation facility for the endangered Bornean orangutans. The role of the Infant Care Unit (ICU) is to provide the veterinary care for infant orangutans, to create public awareness and to provide the public with an opportunity to view how the veterinary care is provided for the infant orangutan. Upper Respiratory Tract Infections (URTI) is common in infant orangutan between age one month to two years. Vital sign and treatment should be closely monitored during the recovery period. URTI may lead to lower respiratory tract infection.

Keywords: Immunoglobulin A, Respiratory Tract Infection, Veterinary Care, Treatment, Orangutan.

INTRODUCTION

The orangutan belongs to the Order Primates, a highly diverse and successful taxonomic group of mammals. Primates comprise four major taxonomic groups, the Prosimians, Monkeys, Apes, and Humans (Dharmalingam et al., 2012). The orangutan is classified as a Great Ape, a classification that includes gorillas, chimpanzees and bonobos. There are two species of orangutans, namely the Bornean Orangutan, *Pongo pygmaeus* and the Sumatran Orangutan, *Pongo abelii* (Ancrenaz et al., 2008). BMOUI was started on February 2000 and the idea was initiated by the former Prime Minister of Malaysia YAB Tun Mahathir bin Mohamad. BMOUI formerly known as Pulau Panjang and located in the peninsular Malaysian state of Perak Darul Ridzuan. It covers an area of approximately 35 acres of natural rainforest. Out of 35 acres, 15 acres are developed for their exhibit area with enrichment material (Dharmalingam et al., 2012). ICU in BMOUI was established in March 2004 to provide veterinary care of

infant orangutan. On 14 February 2008, Bukit Merah Orang Utan Island Foundation (BMOUIF) was incorporated to develop *ex-situ* conservation of orangutan focusing on research and education.

Upper Respiratory Tract Infection in Infant Orangutan has been regarded as a nonspecific term that is used to describe acute infection involving the nose, paranasal sinuses, pharynx, larynx, trachea and bronchi (Spurling et al., 2013; Kho et al., 2013). However, it has been suggested that the vast majority of URTIs cases have been benign, and thus, to our knowledge the exact etiology of URTIs has not been understood completely. The transmission of organisms causing URTIs has been known to occur by aerosol, droplet and direct hand-to-hand contact with infected secretions (Aagaard and Gonzales., 2004). In addition, subsequent passage to the nares and eyes also forms the basic procedure of acquiring infections. URTIs can be characterized by a group of disorders which include common cold, pharyngitis,



Figure 1. Vital sign monitoring of infant orangutan during upper respiratory tract infection.

Table 1: Normal vital sign of infant orangutan.

Pulse	120 – 140 per minute
SPO ₂	85 – 99
Temperature	36 – 37

tonsillitis, epiglottitis, sinusitis, bronchitis, rhinitis, and nasopharyngitis, which significantly occurs in URTI (Rohilla et al., 2013).

URTI is common in infant orangutans between the age group of 3 months to 1.5 years. URTI affected animal become less active, complete loss of appetite and sleeping most of the time as clinical signs. Vital signs such as pulse, SPO₂ and temperature should be closely monitored by pulse oximeters (Figure 1). The pulse rate may be ranged between 150 – 160 beat/min. depending on the age group of the orangutan. There are nasal congestion and nasal discharges which may become mucopurulent after a few days. While, common post-mortem findings in such orangutans ; those die from pneumonia are bloody mucus in trachea and lung hepatization (Phelan, 1998). In some cases serous fibrin are found at the end of the lower lobes of lungs adjacent to the diaphragm. Common microorganisms isolated are *Klebsiella*, *Enterococcus*, *E coli*, *Alpha-haemolytic*, *Streptococcus* species and *Staph epidermidis*. Specific treatments in the form of antibiotics including Ceftriaxone as a wide spectrum antibiotics can administered at a dosage of 50 – 80 mg/kg intramuscularly or intravenously. Ceftriaxone contains an active ingredient of disodium salt substances. Ceftriaxone is usually active against Gram positive, Gram negative and anaerobic bacteria. Also, Amoxycillin clavulanic acid 625 mg at dosage of 25-50 mg orally 2 times daily. Amoxycillin is a combination preparation consisting of a broad-spectrum antibiotic (Amoxycillin) and a beta-lactamase inhibitor (clavulanic acid). Amoxycillin has a bactericidal action: it inhibits synthesis of the bacterial cell-wall during the growth phase by competitive inhibition of transpeptidases. Amoxycillin

is commonly used for treatment and bacterial infection such as upper respiratory tract infections (including ENT); sinusitis, tonsillitis, otitis media. The pyrexia in infant orangutan can be effectively treated orally with drugs like Ibuprofen of Cataflam drops (*Diclofenac Resinate and Diclofenac Potassium 0.5/kg body weight*). If oral administration is difficult, suppositories antipyretic such as Voren (*Diclofenac Sodium 12.5 mg/sipp*) or Arfen 125mg (*Paracetamol BP 125mg*) can be used.

OBJECTIVE

To study upper respiratory tract infection in infant orangutan their treatment and management.

METHODOLOGY

Clinical Symptoms

In URTI the body temperature may range between 37.5°C to 39.5°C. The oxygen saturation ranges between 75% - 85%. Excessive lacrimation and clear nasal discharge is common. Occasionally URTI infant orangutan affected may have mucopurulent nasal discharges. They may also become dehydrated due to poor feeding. They often develop fast breathing. Auscultation may reveal reduced breath sounds or even a silent chest. The vital sign monitoring of infant orangutan during URTI should be closely monitored (Figure 1).Table 1.

Significant respiratory distress may cause hypoxia and impede on their feeding. Such orangutans should have their blood glucose level checked on regular basis. The aim is to maintain normoglycaemia level. They may require Nasopharynx feeding to sustain proper nutrition and oxygen supplement via facemask or incubator oxygen.

Diagnosis

Upper respiratory tract infection can be diagnosed by the clinical symptoms and their vital signs.

Treatment

The infant was treated with Ceftriaxone at dosage of 60 mg/kg bwt twice daily intramuscular for 15 days. The antibiotic can also be



Figure 2. Infant orangutan undergoing nebulization.

administered intravenously. For Pyrexia the infant was given Voren[®] suppositories (Diclofenac sodium 12.5mg/ supp.). Every 4 hours for the first 3 days till the temperature stabilize. Then the dosage was reduced to 3 times daily. To reduce the nasal congestion and to reduce the flem micolytic agent such as Bromohexine at the dosage of 2.5ml 3 times daily.

Supportive Treatment

In case of severe nasal obstruction due to secretions, nasal suctioning should be carried out to remove the mucus nasal discharge. Nasal drop such as Otrivin (*Xylometazoline hydrochloride 0.05 %*) can also be used to clear the nasal obstruction. At times Mucolytic agent such as Bromohexine 2.5 ml 3 times daily or expectorant such as promethazine 2.5 ml can be given 3 times daily orally to reduce the mucus production and to break down the mucus. In severe URTI bronchodilators such as salbutamol and Berodual[®] can be used via nebulization (Figure 2). The dosage will be 10 drops of Berodual[®] and 3 ml of water that can be given through nebulization. Bronchodilator is mainly used to dilate and clear passage that will improve the respiration. Nebulization procedures should be considered when SPO₂ falls below their normal range of 80–90 %. Salbutamol[®] or Ventolin are other bronchodilators that can be used in URTI to clear the air passage. Ventolin can be used in of the dosage of 2.5 mg diluted in 3 ml of water and used in the nebulization process. Prednisolone is an anti-inflammatory glucocorticoid. Glucocorticoids decrease or prevent tissue responses to inflammatory processes. The therapy reduces development of symptoms of inflammation without affecting the underlying cause (Rhen & Cidlowski., 2005). They are commonly used in URTI infection and the dosage should be reduced gradually.

Management

- 1). Positioning of the infant orangutan in lateral recumbent. This will provide an easy passage of air into respiratory passage.
- 2). Chest physiotherapy is provided regularly to remove the mucus from the chest cavity.
- 3). Oxygen therapy should be provided whenever necessary.

Constant nasal and oral extraction to prevent obstruction of the air passage.

The infant orangutan body temperature should be closely monitored for every two hours (Figure 3).

DISCUSSION

The immunological system of newborn animals takes some time to develop their full ability to respond to antigenic stimulation. To protect the young animal for the period after birth, during the immunological maturation is taking place; it receives a supply of material immunoglobulins from the colostrums. The chief immunoglobulin represented in colostrums is IgA (Herbert, 1973). It is important to note that IgA plays an important role in protecting the mucus membrane of the alimentary tracts, trachea and bronchial mucus membrane.

Our studies have shown that infant orangutan separated from their mother due to low birth weight, premature, poor maternal care and mother unable to breast feed suffer from complications such as mouth ulceration, respiratory tract infection, diarrhea and low appetite. These infant orangutans do not respond to any medication and the infant orangutans death is due to combination of one or more infections. Blood test conducted in these infant orangutans shows Leucopenia and Anaemia. Leucopenia is defined as a reduction in the number of leucocytes below the lower normal limit. Theoretically, leucopenia may be due to reduction in either neutrophils or lymphocytes or both (Penington et al., 1978). Anaemia is defined as a reduction below normal of the number of erythrocytes and/or hemoglobin concentration per unit

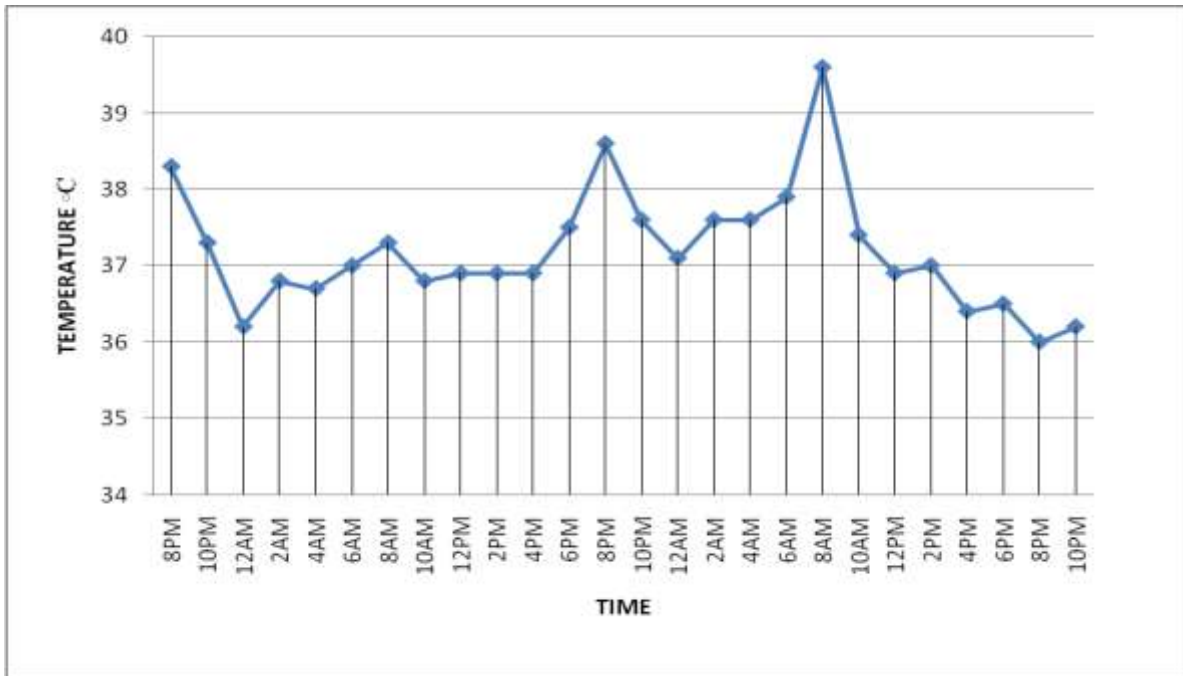


Figure 3. The body temperature monitoring of infant orangutan suffering from URTI

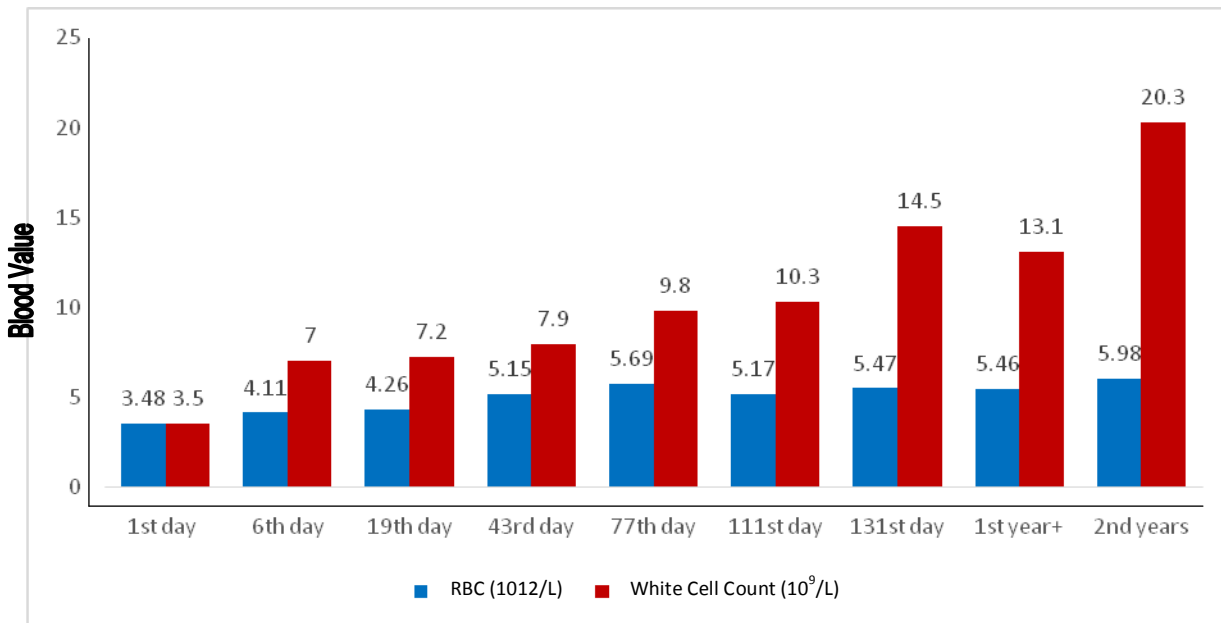


Figure 4. Comparison between RBC and WBC in infant orangutan after giving Colostrum based milk.

volume of blood. With rare exception, anemia is not a primary disease, but rather develops secondary to another disorder (Jones & Hunt, 1983). An investigation was done on one of the infants which were recently separated from the mother due to premature birth. A blood test that was conducted on the infant shows Leucopenia and Hypochromatic Anaemia. The infant was immediately put on Colostrum based milk at dosage 15mg, 4 hourly and 6 times per day. The blood test was

repeated on 6th day, 19th day, 43rd day, 77th day, 111th day, 131st day, 1 year plus till 2 years. We observed after giving Colostrum based milk, there was a gradual increase in RBC and WBC (Figure 4) except on 19th day, there was a slight drop on hemoglobin as the infant orangutan was under antibiotic treatment. The infant ml for a period of one week.

CONCLUSION

Treatment of infants suffering from deficiency of maternal antibodies are considered difficult. For any infection that is taking place in the infant orangutans a certain amount of resistances or immunity should be available in the infant for effectiveness of the antibiotics. In our studies, we have observed that a Colostrum based milk given at dosage improve the blood profile. Other medical complications such as ulceration of the mouth, diarrhea are absent. We obtained a better growth rate without any complication. On the 43rd day of treatment, Leucopenia and Anemia was absent. All infants that are admitted to ICU are fed with Colostrum based milk till they are 1 year 5 months. Based on our studies we observed that respiratory tract infections, diarrhea and other infection are greatly reduced and if these infection are still prevalent that can be easily treated with appropriate antibiotic.

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