

Introduction

Pneumonia is an inflammation of the pulmonary parenchyma usually accompanied by bronchioles (Broncho-pneumonia) and often pleurisy (Pleuro-pneumonia). It is manifested clinically by increased respiratory rate, changes in the depth and character of respirations, coughing, abnormal breath sounds in auscultation etc. All species of animals irrespective of ages suffer from pneumonia. Pneumonia may be of various types eg. Bacterial, viral, parasitic, aspiration, inhalation, allergic, hypoplastic etc. according to their etiology. Among all other diseases pneumonia causes high mortality and poor production of goat (Chakrabarti A, 1994). Aspiration or inhalation pneumonia is a common and serious disease of farm animals. Cases occur after careless drenching or passage of a stomach tube during treatment for other illness (Radostits et.al, 2007). Liquids administered by drench or dose syringe must not be given faster than the animals can swallow, and drenching is particularly dangerous when the animals tongue is drawn out, when the head is held high, and when the animal is coughing or bellowing. Accidental inhalation feeds and forceful administration of feeds is also common cause of Aspiration pneumonia (Mercks' 1991). Clinical signs include cough, tachypnea, tachycardia, pyrexia, respiratory distress and abnormal lung sounds. The prognosis for recovery is poor. There is no specific treatment. Supportive treatment includes anti-inflammatory drugs, antimicrobials, and oxygen supply (Mercks' 1991).

Fibrous osteodystrophy (osteodystrophia fibrosa or osteitis fibrosa cystica) is a metabolic disorder characterized by extensive bone resorption, proliferation of fibrous connective tissues, and insufficient mineralization of the bone tissues. The pathogenesis involves the persistent increase in the parathormone (PTH) levels in the plasma, what may be associated with primary or secondary hyperparathyroidism (Thompson, 2007). Primary hyperparathyroidism is rare in domestic animals and may be linked to parathyroid tumors (adenoma and carcinoma) or idiopathic bilateral parathyroid hyperplasia. However, secondary hyperparathyroidism occurs sporadically and may be attributed to nutritional imbalances or chronic renal disease (Özlem et. Al., 2017). Nutritional hyperparathyroidism usually affects young animals fed diets with low calcium and relatively high phosphorus contents. The condition

includes decreased concentration of serum ionized calcium and consequent increased synthesis and secretion of PTH (*Radostits et.al., 2007*). In FOD, the main clinical manifestations include bone deformities and enlargements, enhanced susceptibility to fractures, and locomotion or postural disturbs. Bones, especially those with high rates of renovation such as mandible maxilla are gradually soften, swollen and become flexible and deformed (*Radostits et.al, 2007, Bandarrra et. Al., 2011, Özlem et. Al., 2017*). Due to this deformities, the face become symmetrically swollen and the tongue become protruded (*Radostits et.al., 2007*). They are painful when bearing weight. At the radiologic examination, widespread areas of rarefaction and cystic spaces in them may be seen (*Özlem et. Al., 2017*). In humans, the disease has been known as von-Recklinghausen disease. Different animal species may be varying in their susceptibility to FOD (*Özlem et. Al., 2017*). FOD is frequently observed in and sporadically described in goats, cattle, horses, foxes, pigs, dogs, reptiles, rabbits, guinea pigs, cats, lemurs, budgerigars and birds (*Thompson, 2007, Bandarrra et. Al., 2011, Özlem et. Al., 2017, Tejaswini et.at, 2018*). But, there is no report about fibrous osteodystrophy in Turkey (*Özlem et. Al., 2017*). As clinical treatment, The oral administration of dicalcium phosphate, at the rate of three to four times the daily requirement, daily for 6 days followed by a reduction to the daily requirement by the 10th day, combined with one injection of vitamin D at the rate of 10 000 IU/kg BW is recommended. Affected animals are placed on a diet that contains the required levels and ratios of calcium, phosphorus, and vitamin D (*Radostits et.al., 2007*).

The present case represents the aspiration pneumonia due to forceful administration of oral drugs especially during FOD condition which is common practice among rural people of Bangladesh for their ignorance.

The aim of this report was to examine clinical and pathological findings of aspiration pneumonia and prophylactic treatment followed by Calcium supplement in a goat.

Case History and Observations

On 25th September 2019, a local cross breed doe of 3 years old and 20 kg body weight was presented at Upazila Veterinary Hospital (UVH), Anowara with the history of inappropriate administration of medication. The doe was 2 month pregnant and was provided with wheat, Gram shell mixture (500 gm. per day) and little amount of green grass and tree leaves. The doe was suffering from salivation, protruded tongue and symmetrical swelling of maxilla gradually from 3 weeks ago. It was under treatment with oral solution of calcium supplement (Liq.Oracal) and catophos prescribed by local quack. The oral calcium supplement was provided forcefully by the owner. During drug administration doe was struggled and spillage some liquid. After that the doe was suffering from fever, dyspnea, off feed, coughing and protruded tongue from 4 days (figure 1&2). On clinical examination, body temperature was found 104° F with pale mucus membrane and mild dehydration. There was slightly nasal and ocular discharge. The respiration rate was shallow and hyper-apneatic and the heart rate was tachycardia form. On respiratory auscultation crackles sound was found. On palpation of maxilla and mandible, there was pain sensation at maxilla-mandibular joints.



Figure 1: Aspiration pneumonia in a doe with FOD



Figure 2: Swollen face and protruded tongue were the main symptoms of FOD in this doe

Laboratory Findings

As a part of diagnosis, a blood sample was taken from the doe. For that, the blood was collected from left jugular vein of the doe aseptically with povidone iodine. 16ml blood was collected with two 10 ml syringes. The sample was transferred to the two EDTA provided vacutainer to prevent blood coagulation and stored in room temperature. The sample was sent to the diagnostic lab of Department of Physiology, Biochemistry and Pharmacology, CVASU for hematological, biochemical test.

According to the laboratory diagnosis report, there were found some abnormalities in values.

Table 1: Routine blood test profile of the doe with FOD (*Radostits et.al, 2007*)

Traits	Units	Test sample value	Reference value
Hemoglobin	(g/dL)	5.8	8.0-12.0
Hematocrit (packed cell volume)	%	45	22-38
TEC	($\times 10^6/1L$)	13.6	8.0-18.0
MCV	(fL)	33	16-25
MCH	(pg)	4.3	5.2-8.0
TLC	($\times 10^9/L$)	14.9	4.0-13.0
Neutrophils	($\times 10^9/L$)	9.7	1.2-7.2
Lymphocytes	($\times 10^9/L$)	4.4	2.0-9.0
Monocytes	($\times 10^9/L$)	0.2	0-0.6
Eosinophils	($\times 10^9/L$)	0.4	0-0.7
Thrombocytes	($\times 10^9/L$)	530	300-600

On hematological test, there was found low level of hemoglobin, MCH value but increased in hematocrit, MCV value. TLC and neutrophils values were higher than normal.

Table 2: Biochemical findings in a doe with FOD (*Radostits et.al, 2007*)

Traits	Units	Test sample value	Reference value
Calcium	(mg/dL)	6.3	11.5-13.0
Phosphorus	(mg/dL)	9	5.0-7.3
Ca:P ratio		0.7:1	2:1
PTH	(pg/ml)	679.5	15-65
ALP	(units/L)	786.2	70-390

On biochemical value of the doe blood, there was decreased in serum calcium and increased in serum phosphorus value which imbalance the Ca: P ratio and reduced it from normal. Also the PTH and ALP values were much higher than the normal value.

Treatment and Outcome

Aspiration pneumonia was treated with broad spectrum antibiotic Ceftriaxone @ 25mg per kg (injection. Triject 2gm ®) intramuscularly, antihistaminic Promethazine @ 1mg per kg (inj. Dellerger®) intramuscularly, NSAID Meloxicam @ 0.2mg per kg (inj. Melvet®) subcutenously and bronchodilator Aminophylline 10mg per kg (nj. Filin®) intramuscularly for 5 days (*Saifuddin and Ahad, 2016*). After proper cure of aspiration pneumonia, treatment of FOD was suggested with complete removal of the wheat feed and Inj. Calcivit plus ® @ 20 ml per day intravenously or subcutaneously as calcium supplement for 6 days followed by oral supplement Bol. CP-vet plus® @ 2 bolus per day for 15 days.

The doe started feeding after 5 days of treatment. The aspiration pneumonia was mostly cured in 10 days of treatment and suggested for FOD treatment. Doe was completely recovered after 35 days of treatment.

Discussion

Clinical history and signs of fever, dyspnea, hyper apnea, shallow breathing slightly nasal discharge and crackle sound of lung were similar to the literature of aspiration pneumonia (*Mercks' 1991, Chakrabarti A, 1994, Radostits et.al, 2007*). As the doe had facial problem and protruded tongue, there was chance of oral liquid drug went to the respiratory tract on forceful feeding and resulted aspiration pneumonia (*Mercks' 1991, Chakrabarti A, 1994, Radostits et.al, 2007*). Also on hematological report the TLC level was higher than the normal reference value which indicated infection and increased neutrophils reveals it was a bacterial origin disease (*Boden, 2005*). The increased amount of the hematocrit and MCV might be due to mild dehydration which resulted low blood fluid volume and increased solid constituents and the decreased value of hemoglobin and MCH might be due to pregnancy or lower iron intake by feed. (*Ratini, 2019*).

On the other hand, the clinical history and clinical signs of doe with anorexia, dyspnea, symmetrical swelling of the face, swollen and painful condition of the mandible and maxilla were similar to the literature of FOD expect for locomotors problem and possible fracture (*Radostits et.al, 2007, Thompson, 2007, Bandarra et. Al., 2011, Özlem et. Al., 2017, Tejaswini et.at, 2018*). This was may be due to early presentation of the disease and not affected the limbs yet (*Özlem et. Al., 2017*). The diagnostic biochemical report was also similar to the literature of FOD with low serum calcium level and very much lower Ca:P ratio. This imbalance happened due to little allowance of green grass and high amount of concentrate feed which contain higher phosphorus and low calcium amount (*Bandarra et. Al., 2011*). This imbalance triggered the excessive secretion of PTH promotes bone reabsorption and softening of the bones. Generally head bones were effected and they became swollen, soft, deformed (*Özlem et. Al., 2017*). Alkaline phosphatase levels increased might be in the presence of increased bone resorption but this was not a reliable indicator of osteodystrophy (*Radostits et.al, 2007*).

On treatment of the doe, there was given priority to the aspiration pneumonia first due to emergency and treatment of both disease at the same time was not possible due to drug contraindication. Antibiotic cephalosporin contraindicated to the calcium treatment because they calcified together and precipitated in lung and kidney which reduce the drug capability (*Saifuddin and Ahad, 2016*). The drugs and there dosage that were used in treatment purpose were similar to the literature (*Saifuddin and Ahad, 2016*).

Limitations

Due to long distance between UVH and CVASU the sample was not tested within 24 hours of its collection. No radiographic diagnostic test was performed. Also the period of internship was short. For this reason, the proper observation of doe was not done.

Conclusion

Forceful feeding of feeds or oral liquid drugs can go to the respiratory tract and result aspiration pneumonia. FOD is a nutritional deficiency disorder of animals which causes severe problem in bone deformities mostly in jaws and limbs. The case presentation represents a common bad practice of rural areas of Bangladesh & common cause of Aspiration Pneumonia and FOD. Adequate amount of green grass and proper medication methods can prevent them both.

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Biography

I am Abdullah Al Masud, son of Mr. Abdul Momen and Mrs. Rehana Begum. I passed Secondary School Certificate in 2012 (GPA-5.00) followed by Higher Secondary Certificate in 2014 (GPA-5.00). Now I am an intern veterinarian under Faculty of Veterinary Medicine in Chattogram Veterinary and Animal Sciences University (CVSU). In future, I would like to work as a veterinary practitioner and research on animal diseases and production improvement in Bangladesh.