**Chapter I: Introduction**

Bangladesh is an agro-based country. Livestock is an integrated component of agricultural farming system that plays a crucial role in nutrition, generation of income,employment and in the traditional economy of Bangladesh.Meat and milk are the main animal protein sources of the 17 cores people of Bangladesh. Ruminantsespeciallylarge ruminants (Cattle and Buffaloes) and small ruminants (Sheep and goat) constitute the major portion of livestock. There are 23.78 million cattle,1.47 million buffaloes,25.76 million goats and 3.33 million sheep in Bangladesh (BBS, 2015-2016). The total contribution of livestock in Bangladesh to Gross Domestic Product(GDP) is approximately 1.66%(BBS, 2015-2016). It generates 13% of foreign exchange and provides fulltime employment to about 20% and partial employment to about 50% of rural population(Alam. 1993).

The navel of the calf is how its circulatory system is attached to the uterus. This provides oxygenation and nutrition to the calf while it is maturing in the uterus. When the calf is delivered, most of these vessels regress and the calf’s own circulatory system takes over. While the navel stump is wet, it serves as a wick attracting pathogenic organisms. These organisms can migrate into the navel through the shrinking vessels. In severe cases, the infection may reach the liver, kidney and joints.

The bacteria normally isolated from posted calves with severe septicemia are*Escherichia coli (E. coli)*. These organisms prove to be very resistant to common antibiotics. Once the internal organs are affected and the calf becomes comatose.

There are some constraints which discourage farmer to rear livestock.The agro-ecological and geo-climatic conditions of Bangladesh are highly favorable for various diseases.The poor people in the villages rear cattle to alleviated their poverty but after birth,in calves,navel illwhich can be easily overlooked (Blood et al., 1989),but from the local infection at navel,extension may occur to the liver or via the urachas to the bladder and result in chronic ill health, or to produce systemic septicemia.In blood born infections localization is the most common in the joints producing a suppuratives or non suppuratives arthritis (Blood et al., 1989).The facultative myiasis producing flies such as houseflies, blowflies,flash flies can be responsible for navel infection (Susan et al., 1998).However there has been limited works on this disease in Bangladesh.Though the infection is highly dependent on antibody level in the body(Blood et al.,1989) but it is also depends on the management of after birth (Hungerford et al., 1991). The housing and floor management is very important after birth (Hungerford et al., 1991) and calves remain in high risk within 3-5 days according to the antibody level in the blood (Hungerford et al., 1991). The mortality is also high during this time due to development of septicemia(Blood et al., 1998).Myiasis can complicate the condition (Susan et al., 1998)and joint ill can consequence the condition through septicemia (Susan et al., 1998;Blood et al., 1989 and Hungerford et al., 1991).

**Objectives of the study**:

Considering the above mentioned facts, the present study was undertaken with following objectives:

1.To know the prevalence of navel ill at Muktagachhaupozila in Mymensingh district

2. To know the association of navel ill with selected individual and farming factors

**Chapter II: Materials and Methods**

**Study area:**

The study was carried out at upozila livestock development center, Muktagachha,in Mymensingh District.

**Study period:**

The total study period was 6 weeks from 1stMarch to 15thApril 2017.

**Population:**

All presented cases with navel ill in the hospital are considered as the case.

**Demographic information:**

**Breed**: Crossbred calves (L X HF,L X Jer,L X Sin)

**Age**: Age was an important criterion for the occurrence of navel ill.The age of the calves were divided into three groups to investigate the incidence of navel ill.

**Table 01:No of calves affected by navel ill in different ages**

|  |  |  |
| --- | --- | --- |
| **Sl. No**. | **Age** | **No.of calves** |
| 1 | Below one month of age | 10 |
| 2 | One to three months of age | 06 |
| 3 | Three to six months of age | 04 |

**Sex**: Both male and female calves were included to investigate the incidence of navel ill.

**Table 02:No. of calves affected by navel ill in different sexes**

|  |  |  |
| --- | --- | --- |
| **Sl. No** | **Sex** | **No. of calves** |
| 1 | Male | 14 |
| 2 | Female | 06 |

**Socio-economic status of the farmer:**

**Education:** 70% of the farmers were illiterate and 30% of the farmers were literate.

**Profession:**75% of the owners of the animal were farmer and 25% of were businessmen.

**Rearing experience:**60% of the animal owners were little experience about calf rearing and 40% were no experience.

**Managemental factors:**

Managemental factors included use of antiseptic after birth at the navel region and type of floor such as concrete, semi concrete, and mud floor on which the calves were reared.

**Table 03: No. of calves affected by navel ill on different floor types**

|  |  |  |
| --- | --- | --- |
| **Sl. No** | **Floor Type** | **No. of calves** |
| 01 | Concrete floor | 04 |
| 02 | Semi concrete floor | 07 |
| 03 | Mud floor | 09 |

**Environmental factor:**

Environmental factors means hygienic and unhygienic environment.

**Hygienic environment:** Hygienic environment were defined as having good bio security, drainage facilities, use of disinfectants etc.

**Unhygienic environment:** Unhygienic environment were defined as not having good drainage facilities.

**Patient data:**

The patient data were collected by the following ways-

**Complaint of the owners:**

Complaints of the owners were swelling, redness, pain, increase body temperature, anorexia and pus discharged from the umbilicus.

**History of the patient:** History of the housing system, environments, where the calf reared, uses of antiseptics, management practices after the birth etc.

**Diagnostic techniques:**

Cases of navel ill were considered in the present study when the animal was registered with the following clinical findings.

**Clinical examination:**The patient was subjected to detail clinical examination for diagnosis of the diseases.

**Over all clinical signs:**

1. There were infection in the navel area, swelling with heat and pain.

2.Abscess or pus coming out from the area.

3. Increased temperature up to 106℉.

4. Animal were usually unable to stand,stiffed gait.

5. Myiasis in the navel area.

6. Sometimes joint ill with consequence of the diseases.

**Clinical examination:**

1. Swelled navel and joint area.

2. Pus and bloody discharge come out with foul smell.

3. Maggotcomes out.

4. Increased temperature.

**Steps were taken for general correction of navel ill:**

The patient was restrained physically and placed dorso-ventrally.



The navel area was sterilized by using tincture of iodine.



If the area was sealed by fibrous tissue then a small incision was given on the area.



For drained out the pus manual pressure was applied.



Tincture of iodine or potassium per-manganet solution was applied in the area by using cotton holding with forceps and wash properly to destroy the pyogenic membrane.



Finally a tincture iodine mixed gauge was left in the area without any suture to maintain proper drainage of the discharges.



The local antibiotic was given in the area along with systemic antibiotics

**Steps were taken for the complication of navel ill with myiasis (maggot infestations):**

The patient was restrained physically and placed dorso-ventrally.



The navel area was sterilized by using tincture of iodine.



Then visible maggots were removed from the wound by holding them with a forceps.



As much as possible, maggot was removed from the wound.



Then oil of turpentine or naphthalene powder was applied within the wound by forceps.



The patient was left for sometimes to make the oil of turpentine or naphthalene powder working.



Then all the inactivated worms were removed from the wound.



Finally a tincture iodine mixed gauge was left in the area without any suture to maintain proper drainage of the discharges.



Finally the local antibiotic was given in the area along with systemic antibiotics.

**Steps were taken for the consequence of navel ill (joint ill):**

The patient was restrained and placed carefully.



The joint area was sterilized by using tincture of iodine.



In case of highly swollen the joint area needle aspiration was done to remove the accumulated serous fluid from the joint as it can minimize pain sensitivity of the patient.



Then 0.2 % potassium permanganate solution was pushed in to the joint to wash it.



Then systemic and local antibiotic was given to the patient.



**Figure 02: Dressing of navel ill infection**

**Figure 01: Navel ill with non-descriptive abscess formation in a calf.**

**Treatment schedule:**

**Table 04:The variable treatments weregiven after surgical correction**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sl. No | Drugs used | Generic name | Trade name | Dose prescribed | Route | Duration |  |
| 1 | Antibiotics | Procaine penicillin, Benzyl penicillin & Streptomycin | SP-Vet | 1 ml/15 Kg | i/m | 5 days |
| Procaine penicillin, Benzyl penicillin & Streptomycin | Streptopen | 1 ml/15 Kg | i/m | 5 days |
| Oxytetracyclin Hydrochloride | Renamycin LA | 1 ml/10 Kg | i/m | 7 days |
| 2 | NSAIDS | Diclofenac sodium | Clofenac vet | 1ml/20 kg | i/m | 4 days |
| Ketoprofen | Kop-Vet | 1 ml/30 kg | i/m | 4 days |
| 3 | Antihistaminics | Pheniramin maleate | Histavet | 2 ml/calf | i/m | 5 days |
| Pheniramin maleate | Antihista vet | 2 ml/calf | i/m | 5 days |
| Promethazine | Dellergen | 2 ml/calf | i/m | 5 days |
| 4 | Steroids | Dexamethasone sodium phosphate | Dexavet | 1 ml/calf | i/m | 1 day |

**Chapter III : Result and Discussion**

**Table05: Navel illin calves irrespective of housing system**

|  |  |
| --- | --- |
| **Housing system** | **Prevalence**  **No. (%)** |
| Concrete floor | 4 (20) |
| Semi concrete floor | 7 (35) |
| Mud floor | 9 (45) |

The navel ill in the calves in relation to the housing system has been presented in the table 05.It has been shown that the flooring systems of the house greatly influence the navel ill infection in calf (Hungerford et al.1991 and Susan et al.1998).During taking history it was found that the animal were reared in three types of floors.The concrete floor were made of bricks and cement and were representing good system of housing as the prevalence of infected animals were found only 20% from the total infected animals .The semiconcrete floors were made of half bricks and half muds and were representing 35% of total cases.The mud floors were made of mud and were representing 45% of total cases.According to the result it is clear that the concrete floors are much better than the other types of floors to check the navel infection .In case of concrete floors it is easier to maintain good sanitation (Hungerford et al.,1991 and Blood et al.,1989).After parturition when the new born animal is in high risk of infection it is necessary to maintain proper sanitation (Blood et al).Concrete floor provide less chance of contamination through the navel area,as it cannot easily soiled by parasites, maternal discharges, urine and dung(Hungerford et al., 1991)

**Figure 03: Prevalence of infection in different housing system.**

**Table No 06:Navel ill found in calves irrespective of sex**

|  |  |
| --- | --- |
| **Sex of animal** | **Prevalence**  **No. (%)** |
| Male | 14 (70) |
| Female | 06 (30) |

The navel infection in relation to the sex of the animal is given in the table06.It was found that from the total of 20 animals 14 were male and the rest were female.The result is representing around 70% of the total cases were found in male and 30% were female.The males are highly susceptible to the infection than the females(Hungerford et al., 1991 and Susan et al., 1998). The males are having urethral opening nearer to the navel area where as females are having the opening distend from navel region(Hungerford et al.1991).As a result the navel area of males get more chance to be soiled by urine (Hungerford et al., 1991).

Navel ill in relation to sex of the animal:

**Figure 04: Prevalence of infection in different sex category.**

**Table 07:Navel ill found in calves irrespective of age**

|  |  |
| --- | --- |
| **Age of the animals** | **Prevalence**  **No. (%)** |
| Below one month | 10 (50) |
| One to three month | 06 (30) |
| Three to six month | 04 (20) |

The navel infection in respective to the age is given in the table no07.It was found that from the total no of 20 animals, 10 animals were infected at the age of below one month,6 animals were within one to three month, and 04 animals was found more than three months .The result is representing around 50% of the total cases were below one month,30% of the cases were within one to three month and 20% were more than three month .According to the result it is clear that the animals of less than one month got highest prevalence of getting infection and the animals of more than three month got less infection.The new born have greater chance of infection after the birth (Blood et al., 1989).It somewhat depend upon the maternally derived antibody and also on the amount of colostrum in take(Blood et al.1989) Moreover it take some times for the navel area to be fully dried out and during this time the calf get more chance to be infected(Hungerford et al., 1991).

**Figure 05: Prevalence of infection in different age category.**

**Table 08:Mortality found in calves irrespective of age of the animal**

|  |  |  |  |
| --- | --- | --- | --- |
| **Age of the animal** | **Animal died** | **Total no. of animals** | **Prevalence**  **No. (%)** |
| Below one month | 02 | 10 | 02 (20) |
| One to three month | 01 | 06 | 01 (16.67) |
| Over three month | 00 | 04 | 0(0) |

The mortality rate of the calves in relation to the age of the animal is shown in the table 8. It was found that 02 calves died among the 10 animals of below 1 month, which represent 20%. Again 01 calf died among the o6 animals, which were within one to three month, which represent 16.67%, and no animal died over three month of age among the found cases. According to the result it is clear that the disease is more vulnerable at the age of below one month and less vulnerable at the age of over three months. The reason may depend on susceptibility of the calves to the disease at the age of below one month(Hungerford et al., 1991).It also depend on the colostrum intake after birth and maternally derived antibody level within the body(Blood et al., 1989)As the calves grow up with their age they can eventually cope with the environment and disease resistance capacity can build up within their body (Blood et al., 1989).

**Figure 06: Prevalence of mortality in different age category.**

**Table 09:Navel ill is found irrespective of complications**

|  |  |
| --- | --- |
| **Complications** | **Prevalence**  **No (%)** |
| Non descriptive abscess formation | 12 (60) |
| Infection with myiasis | 05 (25) |
| Infection consequence arthritis | 03 (15) |

The navel ill found in relation to the complications are shown in table no08. It was found that the number of cases of non-descriptive abscess formation was 12 among the total no of 20 animals, which represent 60% of the total cases. The infection with myiasis was 05 in number, which represent 25% of the total cases .The navel infection consequence with arthritis were found 03 in number, which represent 15% of the total cases. Navel ill can be complicated with abscess formation as a primary condition leading to a systemic reaction with toxemia and extension of the pyogenic infection, (Bain et al., 1963).From septicemia arthritis can also consequence the navel infection (Bain et al., 1963,Blood et al.,1989 and Hungerford et al.,1991).The navel infection can aggravate by maggot infestation lead to myiasis (Susan et al., 1998).

**Figure 07: Prevalence of complication in different infection category.**

**Chapter IV:Conclusion**

Conclusion from the current study it will be concluded that:

1. The calves remain in high risk to navel infection at below one month of age due to lack of colostrum in take from mother.
2. Male calves are more susceptible due to more chance of contamination through urine.
3. The complication found with myiasis due to lack of proper care.
4. Mud floor are more susceptible to navel infection than concrete and semi concrete floor due to more chance of contamination.

**Chapter V:Limitation of the Study**

**Shortage of study period:**

The study period (6 weeks) was short to perform such types of work.

**Study population:**

The population were selected on the basis of internship placement at upozilla livestock development centre, Muktagachha in Mymensingh district.

It may not totally represent the overall condition of Bangladesh.

**Recall bias:**

Farmers were reported not to have seen equally cooperative and friendly. They sometimes tried to escape in the middle of the interviews. Moreover ,even, interviews were not always right persons who involved with rearing of animal directly .Variable measurement were dependent on reporting of the farmer in most of the cases that recall or incorrect information could have gathered on the way .

**Information access and data quality:**

The owners of the farm were not interested to provide sufficient information.However in some cases data were collected only based on memory of the farmers.

**Inadequate literature:**

Reference books,journals and others paper were inadequate in the library for enriching the report.

**Chapter VI:Acknowledgement**

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**The Author**

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**ChapterVIII:Appendix**

**Questionnaire**

Sl No. Date:

1. Name of the owner & Address:…………

2. Name of the farm:……………….

3. Description of the animal:

a) Age…………………..b) Breed…………….c) Sex…………..

d) BCS……………………e) Date of birth (approximately)………

f) Body temperature………………..g) Breeding history…………

4. From when you have seen this infection…………….

5. Is it a congenital case…………………….

6. After birth of the calf have you use any antiseptic to the umbilical region of the calf…………………..

7. Have you use any fly repellent to the house after birth……………

8. Housing type: Intensive/semi-intensive/mud/others…………..

9. Type of floor of the house…………….

10. Have you use any disinfectant to the floor and how frequent………

11. Where the calf lie on………......................

12. Stay with dam…………………………….

13. After birth colostrum eat or not…………………..

14. Environment (Hygienic/Unhygienic)……………………….

**Biography**

This is Md. Mukitur Rahman, from Mymensingh, son of Md. Muzibur Rahman and Momotaz Begum.I have completed my Secondary School Certificate from Nabarun Biddya Niketan with CGPA 5.00 out of 5.00 in 2009 and Higher Secondary Certificate from Govt. Shahid Smrity College, Muktagachha with CGPA 5.00 out of 5.00 in 2011 under Dhaka board. Now I am enrolled in the yearlong Internship program. I am interested toward the higher study and research in the field of Veterinary Medicine.