

# **INCIDENCE, CLINICAL OBSERVATIONS AND MANAGEMENT OF MYIASIS IN ANIMALS AT LOHAGARA UPAZILLA IN CHITTAGONG DISTRICT.**

## **ABSTRACT**

---

A study on incidence, clinical observation and management of different types of Myiasis and their management in animals particularly goats and cattles under Lohagara upazilla in Chittagong district was carried out in Lohagara upazilla veterinary hospital during 60 days internship program from 09.02.14 to 08.04.14. This clinical study was conducted with 434 animals where 25 (both cattle and goat) were affected with different types of myiasis. It was found that the overall observation of different types of myiasis was 7.01% in goat and 4.54% in cattle at Lohagara upazilla in Chittagong district. The data about the age, breed, sex etc. were recorded for each of the examined animals. The general clinical examination, inspection and palpation method were used to examine the animals. Diagnosis of the disease was based on the clinical history collected from the owner and clinical findings and not confirmed by any diagnostic laboratory. Some commercial irritating, antibacterial and antiseptic solution were evaluated for the management of clinical cases of different types of myiasis. The therapeutic evaluation was assessed on the basis of days required for complete healing of myiasis affected skin or areas or other parts of the body. It may concluded from the result that concerned authority should give special attention on controlling myiasis and should also provide extension service to the farmers for increasing awareness about the epidemiology, control and prevention of different types of myiasis.

---

**Key words:** Incidence, types of myiasis, clinical signs, management.

## INTRODUCTION

Myiasis is the infestation of live human and vertebrate animals with dipterous larvae, at least for a period, feed on the host's dead or living tissue, liquid body substances, or ingested food (Zumpt, 1965). The hosts are usually mammals (human or vertebrate animals), occasionally birds and less commonly, amphibians or reptiles (Anna, 2001).

Presence of wounds, soreness and laceration, wounds after delivery, wetted condition with urine contamination, poorer clothing, sanitation and hygienic condition, wetted fleece, hair, recent surgery, bacterial skin contamination with foul odor, lack of aseptic wound care and fecal contamination are still documented as the main predisposing factors for myiasis (Myiasis Wiki vet, 2011). As clinical point of view, myiasis can present as cutaneous myiasis, anal myiasis, genitor-urinary myiasis, nasopharyngeal myiasis, ocular myiasis, body cavity myiasis, wound myiasis, aural myiasis and intestinal myiasis (Palmer, 1970).

Myiasis infestations cause irritation, annoyance to animals and disruption of normal habits including resting, feeding and digestion. As a result, this condition may lead to retarded growth, loss of weight and reduced milk and meat production etc. The infested animals bite and rub the affected area which leads to poor quality hide and wool production as a consequence of skin abrasion (McKelvie *et al.*, 1993; Liakos, 1986). In addition, Oestridae affects livestock production causing abortion, reduced milk production, losses in weight and fertility and an impairment of the host's immune system (Otranto *et al.*, 2004).

The most frequent host for myiasis is cattle and goat (46.4%), followed by dogs (15.3%), humans (14.7%), pigs (6%), horses (4%) and sheep (1%) (Sergio *et al.*, 2007). The prevalence of myiasis has been reported to be 37.4%, the infection rate may, however, go up to 100% (Papadopoulos *et al.*, 1997). Cattle frequently sustain different types of wounds and it appears from clinical impression that a good percentage of these wounds are complicated with maggot infestation. This problem in cattle is fairly common in the field condition particularly in the season of fly prevalence (John, 1999).

The available literature of different regions of the world contains a full description of myiatic wound, responsible flies with their life-cycle, pathogenesis, and clinical history with diagnosis and therapeutic regimen which was undertaken against the condition.

Considering all aspects described, the present study, therefore, undertaken with the following objectives.

**Objectives of the study:**

- To study the clinical observation and management of clinical case of Myiasis
- To study the incidence of Myiasis in terms of breed, age and sex at Lohagara Upazilla in Chittagong district.

## RIVIEW OF LITERATURE

**Bhola et al., (2012)** revealed that infestation of myiasis in vertebrate species was pandemic but more frequently found in tropical and subtropical countries where poor hygiene, poor housing infrastructure, warm humid climate and proximity with domestic animals prevail. The diagnosis was made basically by the presence of larvae.

**Dik et al., (2012)** carried out a study between the years of 2006-2010; to detect etiological agents of myiasis occurred in animals and human beings in Turkey. Among the 28 myiasis cases examined, 22 of them were traumatic myiasis while 2 were anal myiasis, 2 aural, 1 nasal and 1 oral myiasis. Among the cases, 23 were detected in the animals, while 5 cases occurred in the human beings. Five species; *Wohlfahrtia magnifica*, *Sarcophaga haemorrhoidalis*, *Lucilia sericata*, *Calliphora vicina* and *Eristalis tenax* were identified as etiological agent of the myiasis. *W. magnifica* was detected as pre-dominant species in the traumatic myiasis cases. *L. sericata* was found as secondary agent in all cases. The other species were detected in only one each case.

**Duygu and Polat (2012)** reported *Lucilia sericata* was one of the factors resulting in facultative traumatic myiasis in animals and humans. *L. sericata* threatens human health and leads to significant economic losses in animal industry by leading to serious parasitic infestations. A three month old female rabbit was presented to the clinics of the Veterinary Faculty of Dicle University for the treatment of the wound located on the left carpal joint. The examination revealed that the wound was infested with larvae of *L. sericata*.

**Gaglio et al., (2011)** reported three cases of genital myiasis by *Wohlfahrtia magnifica* (Diptera: Sarcophagidae) in Sicily (Italy) that occurred in a goat, a ram and a dog respectively. Maggots were found in the vulva of a goat, in a wound localized in the scrotum of a ram and in the prepuce of a dog.

**Giangaspero et al. (2011)** visited seven farms in Italy for the identification of larvae-infested wounds. Ninety-six (3%) out of 3129 sheep examined and had a traumatic myiasis with a very high percentage of infested animals which found only in a farm (10.5%). Wounds were mainly localized on the vulva and prepuce. None of the 10 goats in one

infested flock had wounds, whereas a shepherd dog from another flock presented a wound on the ear.

**Beth Knapp-Tyner (2010)** stated deer fawn myiasis in a survey of fawn rehabbers. High humidity and warm summer temperatures set the stage for perfect breeding conditions for the Green bottle fly (*Lucilia sericata*) on neonate White-tailed deer fawns. The adult female flies lay their eggs (130-200 at a time) on warm damp areas of the young fawns. The most common sites of myiasis of fawn were: rump/hip, rectal/vaginal, tail, inter-digital space & tarsal glands, metatarsal gland, teats, umbilicus, chest/back, pre-orbital gland.

**Phillips (2009)** stated that, sheep are predisposed to fly strike (cutaneous myiasis) if their fleece was wet or contaminated with feces or urine. Frequent removal of wool by crutching, dagging and shearing will aid wool desiccation after rainfall and decrease fleece contamination with excreta. Reducing fly populations can be achieved by the use of traps and insecticides. The breeding of sheep without wrinkles or wool on their hindquarters offers the most likely method of control, although a small proportion of sheep are affected on other parts of their body.

**Rahman et al., (2009)** conducted a study on healing of myiasis wound in cattle at the Veterinary Clinic, Bangladesh Agricultural University, Mymensingh. They found that, myiasis wounds were very prone to occur in the navel, vulva, scrotum and shoulder area. These wounds predominantly occur in the cattle of over 2 years. The females were more frequently affected than the males. The study suggests that, local dressing of wound with oil of turpentine and intramuscular administration of combined penicillin and streptomycin may be practiced for the clinical management of myiasis in cattle.

**Soyelu and Masika (2009)** carried out a questionnaire survey in 83 cattle farmers to traditional remedies used in the treatment of cattle wounds and myiasis in Amatola Basin. Majority of respondents (67.9%) used traditional remedies and 25.9% conventional medicines with traditional remedies for treatment of myiasis. Manual removal of maggots from wounds was practiced and treatment is usually continued until the wound heals.

**Trombetta et al., (2009)** stated that blowflies (Calliphoridae) comprise several species that may cause myiasis by colonizing wounds or infected body orifices. This species often causes traumatic myiasis in cattle, dogs and cats, and it is not rare in humans.

**Duro et al., (2007)** recognized umbilical myiasis in animals, infestation of human umbilical cord and abdominal tissue is a rare occurrence. It is occurred due to new-world screw-worm fly, *Cochliomyia hominivorax*, is an obligate ecto-parasite of domestic and wild animals.

**Kara et al., (2005)** examined 1276 cattle by palpation of the skin for evidence of hypodermosis in Turkey. The effects of age, sex, breed, and color of cattle on hypodermosis were investigated. Overall prevalence was 31.9%. Within the herd, intensity of the infestation decreased with the age of cattle and infestation rates of these fly larvae were lower in native cattle, in females, and in piebald animals.

**Cramer and Chiganer (2002)** performed an inquiry about myiasis to identify predisposing factors by *Dermatobia hominis* larvae in dogs during 2000 in the Southern Zone of Rio de Janeiro municipality. The adult, male, light and short-haired and pure breed dogs were mostly infected. The affected body regions were those that flies can easily access: limbs, dorsal region, lumbar region, head, and neck. In most cases, no complications were observed during and after the treatment and healing time was less than five days. No month of the year presented higher occurrence of cases. Most dogs have become infected when traveling to small farms outside the studied area.

**Dorchies et al. (2000)** conducted a survey to determine prevalence and larval burden of *Oestrus ovis* larvae in sheep and goats during one year in France, northern Mediterranean region. A total of 1303 sheep and goat heads were selected at random. *O. ovis* larvae were found in 274 sheep out of 631 (43.4%), and the prevalence rate varied from 14.3% in February to 65% in October. 191 goats out of 672 were infected (28.4%), and the prevalence rate varied from 6.25% in September to 47.1% in April.

**Farkas and Hall (1998)** described that traumatic myiasis infestation levels >10% of animals especially at sheep, cattle and horses in Hungary. The myiasis season lasted from

March to November with most cases were reported in July and August. Fly larvae were present deep in wounds rather than superficially, consistent with infestations due to the obligate parasite *Wohlfahrtia magnifica* (Diptera: Sarcophagidae). Treatments were carried out at least weekly during the summer. The most common form of treatment was the manual removal of larvae followed by topical application of insecticides, particularly organophosphates.

**Amin et al., (1997)** revealed that sheep were more infested with wound myiasis than goats in Egypt. The overall infestation rate was high in summer, followed by spring then autumn. The least rate of infestation was winter. The factors predisposing to wound myiasis in goats were open wound, shearing wound, caseous lymphadenitis, foot rot, fecal staining, ophthalmic or facial eczema, horn fracture, rumen fistula and lastly posterior paralysis. In sheep, the most important cause was caseous lymphadenitis followed by foot rot, then open wound and fecal staining, shearing wound and ophthalmic or facial eczema otherwise more or less the same as in goats. No doubt, poor hygiene, presence of draining wounds, depressed level of farmers' consciousness and immobility predispose to different anatomic types of myiasis which may extend to man. It was concluded that myiasis among edible animals was a problem of veterinary and economic importance.

**Kumar and Ruprah (1984)** suggested that the anatomical location of wounds affected with myiasis were navel area, vulva, thigh, udder, shoulder and inter-digital spaces of limb. They explained that myiasis occurred in the navel area of newborn calves, vulvar region of recently calved cows and in wounds in between the claws. In their study they have found the highest occurrence of myiasis (27%) in the navel area, followed by vulva and shoulder region (20% in each case).

## **MATERIALS AND METHODS**

### **Study area:**

The study was conducted in Upazilla Veterinary Hospital at Lohagara in Chittagong district.

### **Duration and location of the study:**

The duration of the study was 2 months from 09-02-14 to 08-04-14.

### **Sample size:**

Total 434 animals were observed in my Upazilla veterinary hospital at Lohagara, Chittagong. Among those 25 animals were infected by myiasis (5.76%)

### **Case definition:**

Invasion of the tissues of living animals by larvae of Dipteran flies is called Myiasis.

### **Method of collection:**

All the sick animals brought for treatment to the Upazilla Veterinary Hospital at Lohagara in Chittagong district were first registered in the patient registered book. The description of each registered animal and owner's complaint were recorded.

The age of each sick animal was determined by asking the owner and or by dentitions. A total of 25 animals affected by myiasis were available during the 8 weeks period and the general clinical examinations were conducted on the basis of disease history and owners complaint. Final diagnosis was made on the basis of the interpretation of clinical and epidemiological findings.



## RESULTS AND DISCUSSION

This clinical study was conducted with 434 animals where 25 (both cattle and goat) were affected with different types of myiasis. The result of the study was presented in the table 1 and 2. From the table 1, it was found that the overall incidence of different types of myiasis was 7.01% in goat and 4.54% in cattle under Lohagara upazila in Chittagong district.

From the table 2 it was found that the incidence of vaginal myiasis was highest i.e. 44% followed by myiasis in hoof, naval myiasis and cutaneous myiasis were 32%, 16% and 8% respectively.

**Table no: 1**

Name of the species	No of examined animal			No of affected animal	Incidence (%)
	Buck	Doe	kid		
Goat	90	97	27	15	7.01
Cattle	Bull/Bullock	Cow	Calf		
	89	110	21	10	4.54

**Table no 2:**

Serial no	Name of the types of Myiasis	No of affected cases	Incidence (%)
1	Vaginal Myiasis	11	44
2	Myiasis in hoof	8	32
3	Naval Myiasis	4	16
4	Cutaneous Myiasis	2	8
Total		25	100.00

Different types of myiasis case that observed in Upazilla veterinary hospital in Lohagara, Chittagong as follows:



Fig: Vaginal Myiasis in Doe



Fig: Vaginal Myiasis in Cow



Fig: Myiasis in hoof in Buck



Fig: Myiasis of hoof in Calf



Fig: Cutaneous myiasis in Buck



Fig: Naval myiasis in Calf

## General study

Myiasis is the infestation of live human and vertebrate animals with dipterous larvae, which at least for a period, feed on the host's dead or living tissue, liquid body substances, or ingested food (Frederick Zumpt, 1965).

### Etiology and classification of myiasis

The various forms of myiasis may be classified from an entomological or a clinical point of view. Clinically, myiasis can be classified according to the part of body that is being invaded. This classification was first proposed by Bishopp (Patton, 1922) and later modified by James (1947) (shown in Table A).

**Table-A: Classification of Myiasis according to their anatomical position in or on the host animal**

Zumpt	Bishopp	James
<b>Sanguinivorous</b>	Bloodsucking	Bloodsucking
<b>Cutaneous (Dermal/sub-dermal)</b>	Tissue-destroying	Furuncular
	Sub-dermal migratory	Creeping
		Traumatic/wound
		Anal/vaginal
<b>Nasopharyngeal</b>	Infestations of the head passages	Nose, mouth and sinuses
		Aural
		Ocular
<b>Intestinal</b>	Intestinal/uro-genital	Enteric
		Anal/vaginal
<b>Uro-genital</b>	Intestinal/uro-genital	Bladder and urinary passages
		Anal/vaginal

**Note:** The division of myiasis into five rows is based on the grouping of Zumpt (1965) in the first column. The second and third columns show the comparable groupings of Bishopp (Patton, 1922) and the modification of these by James (1947).

Cutaneous myiasis (dermal and sub-dermal both) involves the invasion of the skin, with the most common target being a wound, near which an obligatory or facultative parasitic fly will lay eggs (Sherman, 2000). In “wound or traumatic myiasis,” both healthy and necrotic tissues can be fed on by the larvae, depending on the conditions and species of fly involved (e.g. *Lucilia cuprina*, *Chrysomya bezziana*, *Cochliomyia hominivorax*). When open wounds are involved, the myiasis is known as traumatic and when boil-like, the lesion is termed furuncular (e.g. *Dermatobia hominis*). If the path of the larvae beneath the skin can be traced, the myiasis is designated as creeping eruption. This is also called as migratory myiasis, which is caused by flies belonging to the genera *Gastrophilus* and *Hypoderma*.

Naso-pharyngeal myiasis (e.g. *Oestrus ovis*, *Chrysomya bezziana*, *Cochliomyia hominivorax*), including aural (e.g. *Lucilia sericata*) and ocular myiasis (e.g. *Oestrus ovis*) involves invasion of the head cavities such as nose, eyes, and ears. Some myiasis involves invasion of the alimentary tract (e.g. *Gasterophilus spp.*) or the uro-genital system (e.g. *Fannia canicularis*, *Musca domestica*) (Kettle, 1990). A rare form of blood sucking myiasis is described as sanguivorous (Dada *et al.*, 2005).

The classification is useful for practical diagnosis (Zumpt, 1965). However, Patton (1922) found it to be unsatisfactory when considering evolutionary and biological relationships, because individual species could be assigned to more than one group and different groups contained species with different levels of dependence on the host. He put forward instead a system based on the degree of parasitism shown by the fly (Table B).

In Patton's categorization, there are two main groups of myiasis-causing species: the specific parasites, which must develop on live hosts; and the semi-specific parasites, which usually develop on decaying organic matter, such as carrion, feces and rotting vegetation, but may also deposit their eggs or larvae on live hosts. Zumpt (1965) termed the specific parasites obligatory and the semi-specific parasites facultative. The facultative species may be further differentiated depending on whether they are able to initiate myiasis (primary species) or only invade after other species have initiated it (secondary and tertiary species) (Kettle, 1984) (Table B). In addition, Patton (1922) defined a third group of myiasis-causing species, those that cause accidental myiasis when their eggs or larvae are ingested by the host. Zumpt (1965) termed this pseudo-myiasis.

**Table-B: Myiasis according to the parasitic relationship of the Diptera with the host**

Group	Subgroup	Remarks
<b>Specific/obligatory</b>		Parasite dependent on host for part of its life cycle
<b>Semi-specific/facultative</b>	Primary	Normally free-living but may initiate myiasis
	Secondary	Normally free-living and unable to initiate myiasis but may be involved once animal is infested by other species.
	Tertiary	Normally free-living, but may be involved in myiasis when host is near death.
<b>Accidental/pseudo-myiasis</b>		Normally free-living larvae that may be accidentally ingested and cause pathological reactions.

Sources: Kettle, 1984; Zumpt, 1965; Patton, 1922

**Examples of flies that cause obligatory myiasis are:**

*Oestrus ovis* (Nasal bot fly), *Hypoderma bovis* (Warble fly), *Dermatobia hominis* (Human bot fly), *Gasterophilus spp.* (Horse bot fly), *Chrysomya bezziana* and *Cochliomyia hominivorax*;

*Primary myiasis* causing flies are:

*Lucilia cuprina* (Green bottle fly; copper bottle fly), *L. sericata*, *Calliphora erythrocephala*, *C. vomitoria* (blue bottle fly), *Phormia regima*, *P. terrae-novae*.

*Secondary myiasis* causing flies are:

*Chrysomya bezziana*, *C. chloropyga* (bluish-green bottle fly/ Screw worm fly), *Sarcophaga haemorrhoidalis* (Flesh fly) (Venugopalan, 2004).

*Accidental myiasis* causing flies are:

*Musca domestica* (Common house fly), *Stomoxys calcitrans* (Stable fly), *Sarcophaga spp.* and *Oestrus ovis*.

*Lucilia spp.*, *Oestrus ovis*, *Sarcophaga spp.* and *Chrysomya bezziana* seems to cause more cases of myiasis in people of India and other parts of Asia than in Africa.

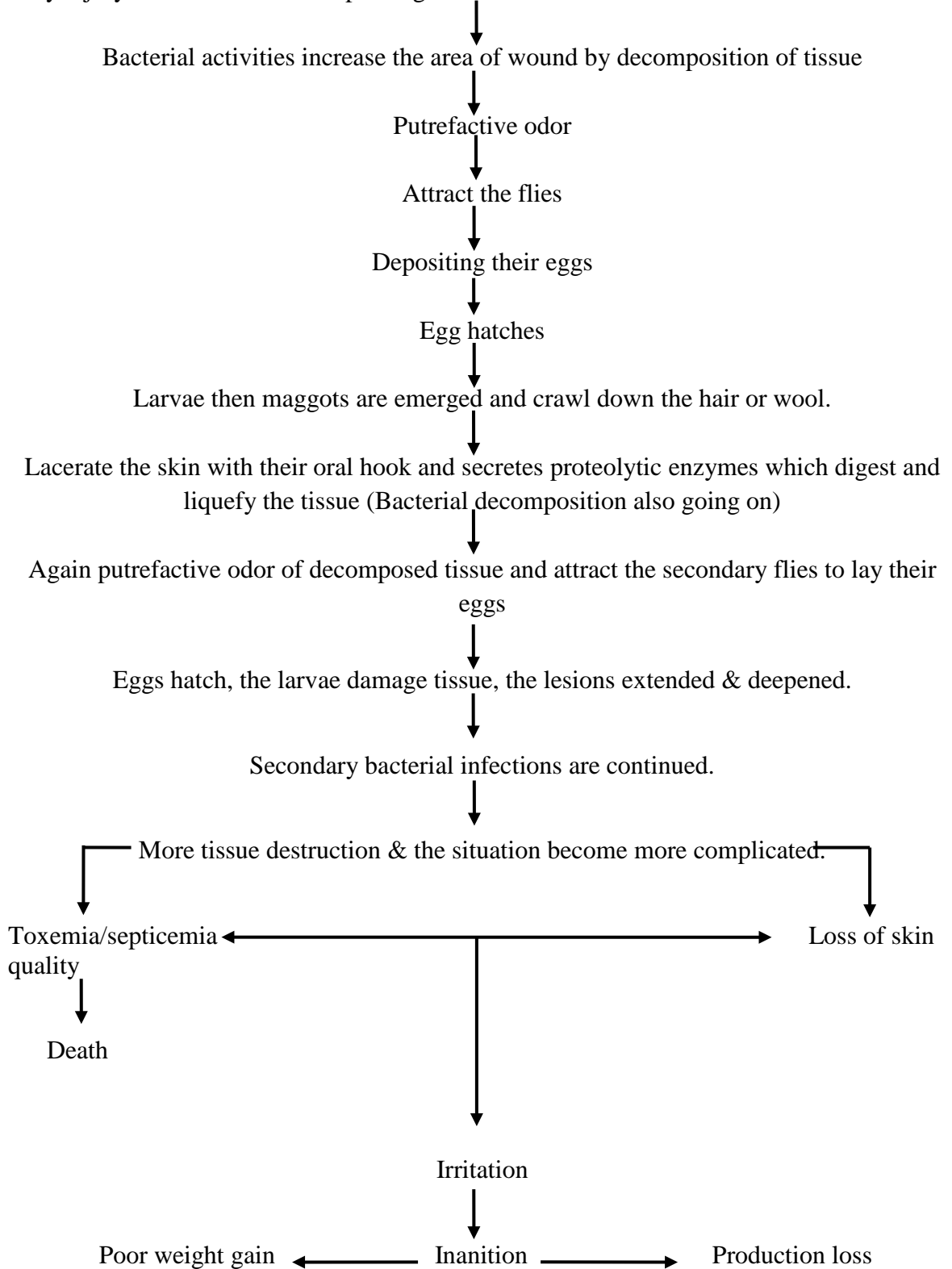
**Wound myiasis:** Wound myiasis occurs when fly larvae infest open wounds. The majority (85%–90%) of cases are caused by larvae of flies belonging to the family Calliphoridae, which includes both obligate and facultative parasites (Sherman, 2000). The wounds have been defined by livestock farmers in South Africa to include sores, abscesses, warts and inflamed skin lesions (Luseba, *et al.*, 2007).

**Geographical Distribution:**

Myiasis is pandemic; prevalence is specifically related to latitude and lifecycle of various species of flies. Its prevalence is mainly in the developing and underdeveloped nations and also tropical and subtropical regions such as Central America, South America, tropical Mexico, sub-Saharan Africa, Trinidad and South-East Asia, where warm, humid climate prevail almost throughout the year; commonly seen where poor sanitation, hygiene is often observed. Infestations are common phenomenon in skin, brisket, navel, tail, anus, vagina, inter-digital space and oral region.

### Transmission and pathogenesis of flies:

Any injury/ Undressed Wound/ prolong wetted condition/ Fecal contamination or dirtiness



### **Incubation Period**

Generally, larvae emerge from the eggs in 12 to 24 hours, but they are difficult to detect in wounds for the first day or two.

### **Species susceptibility:**

The most frequent host for myiasis is cattle and goat (46.4%), followed by dogs (15.3%), humans (14.7%), pigs (6%), horses (4%) and sheep (1%) (Sergio *et al.*, 2007). The prevalence of myiasis has been reported to be 37.4%, the infection rate may, however, go up to 100% (Papadopoulos *et al.*, 1997). Cattle frequently sustain different types of wounds and it appears from clinical impression that a good percentage of these wounds are complicated with maggot infestation. This problem in cattle is fairly common in the field condition particularly in the season of fly prevalence (John, 1999).

### **Zoonotic significance:**

A significant number of reports on human myiasis are available in different regions of the world containing a complete case history, a full description of myiatic wound, responsible flies with their life-cycle, pathogenesis, and clinical history with diagnosis and therapeutic regimen which was undertaken against the condition.

It is rare in developed countries but frequently seen in tropical and sub-tropical regions. Geriatric age group, poor hygiene, low socio-economic conditions, underlying metabolic disorders such as diabetes, vascular disease reducing blood circulation and cancerous conditions can predispose to human myiasis (Ogugua *et al.*, 2011; Sesterhenn *et al.*, 2009). Among the diverse types of human myiasis, those in skin tissue are the most frequent, especially those generated by flies of the family *Calliphoridae*, of which the predominant species are *Cordylobia anthropophagi* (tumbu fly); *C. bezziana*, and *Oestrus ovis* in Africa (Abed-Benamara *et al.*, 1997) and *Dermatobia hominis* (American warble fly) in Central and South America. Most of the fly larvae are transmitted to humans through pet or domestic animals that are infested by larvae. Studies have shown that larvae adapt themselves to a particular environment and undergo hypobiosis either inside or outside the host, according to climatic environmental condition and season.

How myiasis affects the human body depends on where the larvae are located. Larvae may infect dead, necrotic (prematurely dying) or living tissue in various sites: the skin, eyes,

ears, stomach and intestinal tract, or in genitourinary sites (Ockenhouse *et al.*, 1990). They may invade open wounds and lesions or unbroken skin. Some enter the body through the nose or ears. Larvae or eggs can reach the stomach or intestines if they are swallowed with food and cause gastric or intestinal myiasis (John *et al.*, 2006).

**Table C: Several different presentations of myiasis and their symptoms (John *et al.*, 2006).**

Syndrome	Symptoms
<b>Cutaneous Myiasis</b>	Painful, slow-developing ulcers or furuncle (boil) like sores that can last for a prolonged period.
<b>Nasal Myiasis</b>	Obstruction of nasal passages and severe irritation. In some cases facial edema and fever can develop. Death is not uncommon.
<b>Aural Myiasis</b>	Crawling sensations and buzzing noises. Smelly discharge is sometimes present. If located in the middle ear, larvae may get to the brain.
<b>Ophthalmomyiasis</b>	Fairly common, this causes severe irritation, edema, and pain.

Nosocomial Myiasis refers to myiasis in a hospital setting. It is quite frequent, as patients with open wounds or sores can be infested if flies are present. To prevent nosocomial myiasis, hospital rooms must be kept free of flies. Human ophthalmomyiasis, both external and internal, has been caused by botfly larvae (Lagacé-Wiens and Philippe, 2008).

### **Clinical Signs:**

Although the signs of myiasis often observed according to body-site involved, the common signs reported are anorexia, restlessness, pain, irritation, discomfort, alopecia and pruritus. Animal may attempt to bite the affected part. If the lesion is around the buttock region, the animal frequently jerks its hind quarter; wagging of tail in case of the lesion is around the tail. Fleece appears darker, damp appearance and foul smelling. There is also likely to be direct tissue damage, hemorrhage, hyper-pigmentation, secondary infection and death of the animal. Unusually, temperature may raise upto 105-106°F. Signs can be classified as cutaneous, nasopharyngeal, intestinal or uro-genital.



- Warble flies cause cysts along the midline of the back.
- *Lucilia sericata* tends to cause lesions on the inner thighs and perineum due to fecal soiling.
- Nasal myiasis causes irritation and epistaxis.
- Aural myiasis can cause deafness, discharge and foul exudates.
- Gastrointestinal myiasis often causes ulceration, GI bleeding, weight loss and diarrhea.
- *Wohlfahrtia' spp.* cause genital lesions on the vulva and prepuce.

In severe cases, anemia, anaphylaxis and toxemia may be fatal. Likely consequence is reduced feeding and resulting weight loss and infertility.

### **Diagnosis**

Myiasis is usually diagnosed by taking significant clinical history, careful observation of the symptoms and systematic clinical and physical examinations whether any wound or injury specific to myiasis are present. In some cases, biopsy of the skin may be required. Diagnosis is principally dependent on observation of larvae (maggots) on the infested site of the host. Maggots may be found in the wool or hair attaching the skin and at the wound. Larvae may also be observed in the carcass at post-mortem. Gastroscopy may be used in the case of gastro-intestinal myiasis.

### **Treatment:**

Major principles of treatment include:

- Removal of larvae from the wound.
- Protection against the larval development.
- Promotion of healing.
- Cleaning of the affected premises.
- To check the secondary bacterial infection.

Clipping the wool or hair, removal of larvae and local dressing of wound with oil of turpentine on alternate days and intramuscular administration of combined penicillin (procaine penicillin 300000 units and benzyl penicillin sodium 100000 units/50 kg body weight) and streptomycin (0.5 g/50 kg body weight) daily for 7 days resulted healing of 96% wound depth and 94% wound area. Another treatment regime consisted of single subcutaneous administration of ivermectin (0.2 mg/kg body weight) and combined penicillin and streptomycin daily for 7 days which produced recovery of 94% wound depth and 90% wound area. In case of wound dressing with tincture of iodine on alternate days and parenteral administration of combined penicillin and streptomycin resulted in healing of 78% wound depth and 36% wound area (Rahman *et al.*, 2009). Topical treatment by pour-on or dipping is most effective against cutaneous/subcutaneous myiasis.

### **Prevention and control:**

The principal control method of adult populations of myiasis inducing flies involves insecticide applications in the environment where the target livestock is kept. Organophosphorus or organochlorine compounds may be used, usually in a spraying formulation. One alternative prevention method is the SIT (Sterile Insect Technique) where a significant number of artificially reared sterilized (usually through irradiation) male flies are introduced. The male flies compete with wild bred males for females in order to copulate and thus cause females to lay batches of unfertilized eggs which can't develop into the larval stage.

Another prevention method involves removing the environment most favorable to the flies, such as by docking (removal of the tail). More examples are the crutching of sheep, which involves the removal of wool from around the tail and between the rear legs, which is a favorable environment for the larvae. Further more permanent practice which is used in some countries is mulesing, where skin is removed from young animals to tighten remaining skin – leaving it less prone to fly attack ("Standard Operating Procedures - sheep Mulesing", Teacher's notes, 2004).

To prevent myiasis in humans, there is a need for general improvement of sanitation, personal hygiene, and extermination of the flies by insecticides. Clothes should be washed thoroughly, preferably in hot water, dried away from flies, and ironed thoroughly. The heat of the iron kills the eggs of myiasis-causing flies (Adisa, 2004).

**Prognosis**

Primary myiasis without treatment for two weeks or more can cause death of the animal in seasons when flies are numerous, due to repeated and intensive infestations. It is more dangerous in sheep, goat and horse than cattle and dog. Wounds treated within four days after infestation usually recover though it may take about a month. Secondary myiasis easily responds to treatment (Venugopalan, 2004).

## CONCLUSION

The Myiasis case were available in Upazilla veterinary Hospital at Lohagara in Chittagong. The overall observation of different types of myiasis was 7.01% in goat and 4.54% in cattle and vaginal myiasis was highest (44% ) followed by myiasis in hoof, naval myiasis and cutaneous myiasis were 32%, 16% and 8% respectively. The Clinical Examination and management practice of myiasis case was observed and performed directly during the placement schedule in Upazilla Veterinary Hospital. From Clinical history it was known that wounds, abscess, umbilical infection, dirtiness with fecal contamination, wetted surroundings with urine contamination, bed sore, disorganized management system, lack of housing infra-structure were the main predisposing factors of myiasis in animal in that area. So awareness should be developed among the farmers and rural peoples about the overall management of myiasis.

## REFERENCES

- Abed-Benamara M, Achir I, Rodhain F, Pérez-Eid C. (1997). First Algerian case of human oto-myiasis from *Chrysomya bezziana*. Bull Soc Pathol Exot.; 90:172–5.
- Adisa, Charles and Mbanaso, Augustus (2004). Furuncular myiasis of the breast caused by the larvae of the Tumbu fly (*Cordylobia anthropophaga*). BMC Surgery 4: 5.
- Amin AR, Shoukry A, Morsy TA, Mazyad SA (1997). Studies of wound myiasis among sheep and goats in North Sinai Governorate, Egypt. J. of the Egypt. Soci. of Parasitology; 27(3):719-737.
- Anna M. West. (2001). Parasitology and persistence: Infectious Public Health Challenges program in Human Biology, 103.
- Beth Knapp-Tyner (2010). Deer Fawn Myiasis; Wild at Heart Wildlife Re-habilitation.
- Bhola N., Jadhav A., Borle R., Adwani N., Khemka G., and Jadhav P. (2012). Primary Oral Myiasis: A Case Report in India. Case Reports in Dentistry Volume 2012, Article ID 734234, 4 pages.
- Cramer-Ribeiro and Bianca Chiganer (2002). Inquiry of cases of myiasis by *Dermatobia hominis* in dogs of the southern zone of Rio de Janeiro municipality in 2000. Braz. J. Vet. Res. Anim. Sci. [Online]. Vol.39, n.4: 176-180.
- Dada-Adegbola H. O., Oluwatogba O. A. (2005). Cutaneous myiasis presenting as chronic furunculosis. West A FR J Med, 24(4): 346-7.
- Dik B., Uslu U. and Isik N. (2012). Myiasis in Animals and Human beings in Turkey, Kafkas Univ Vet Fak Derg 18 (1): 37-42.
- Dorchies P, Bergeaud JP, Tabouret G, Durantion C, Prevot F, Jacquiet P (2000). Prevalence and larval burden of oestrus ovis (Linné 1761) in sheep and goats in northern mediterranean region of France. Vet Parasitol.; 88(3-4): 269-73.
- Duro EA, Mariluis JC, Mulieri PR (2007). Umbilical myiasis in a human newborn. J. Perinatol; 27(4): 250-1.

- Duygu Neval Sayin Ipek and Polat Ipek (2012). A Case of Traumatic Myiasis in a Domestic Rabbit (*Oryctolagus cuniculus*) Caused By *Lucilia sericata*; Cilt 36, Sayı 1, Sayfa(lar): 054-056.
- Farkas R, Hall MJ (1998).Prevalence of traumatic myiasis in Hungary: a questionnaire survey of veterinarians. Vet Rec.; 143(16): 440-3.
- Gaglio G, Brianti E, Abbene S, Giannetto S. (2011). Genital myiasis by *Wohlfahrtia magnifica* (Diptera, Sarcophagidae) in Sicily (Italy). Parasitol Res. 109(5):1471-4.
- Gebremedhin EZ (2011). Prevalence of ovine and caprine oestrosis in Ambo, Ethiopia. Trop Anim Health Prod.; 43(1): 265-70.
- Giangaspero A, Traversa D, Trentini R, Scala A, Otranto D (2011). Traumatic myiasis by *Wohlfahrtia magnifica* in Italy. Vet Parasitol.; 175(1-2):109-12.
- James MT (1947): The flies that cause myiasis in man. United States Department of Agriculture. Miscellaneous publication no. 631: 175.
- John, David and Petri, William. Markell and Voge's Medical Parasitology (2006): 9th Edition. Missouri: Saunders Elsevier: 328-334.
- John HK (1999). Screwworms: Be on the Lookout. Veterinary Medicine Extension, University of California, Davis Tulare CA 93274.
- Kara M., Arslan M. and Gicik Y. (2005). The Prevalence of Bovine Hypodermosis in Kars Province, Turkey. Tropical Animal Health and Production, Volume 37: 617-622.
- Kettle DS (1990) Med Vet Entomol. CAB International, Wallingford, UK.
- Kettle, D.S. (1984). *Medical and veterinary entomology*. London and Sydney, Cross Helm: 658.
- Kumar R and Ruprah RS (1984). Incidence and etiology of cutaneous myiasis in domestic animals at Hissar [India]. Ind Vet J.; 61: 918-921.
- Lagacé-Wiens, Philippe (2008). "Human Ophthalmomyiasis Interna Caused by *Hypoderma tarandi*, Northern Canada". Emerging Infectious Diseases 14 (1).

- Liakos B.D. (1986). Effect of hypodermatosis on the body weight of young goats. Bull. Hellenic Vet. Med. Soc. 37: 8-12.
- Luseba D., Elgorashi E.E., Ntloedibe D.T. and Van Staden J. (2007). Antibacterial, anti-inflammatory and mutagenic effects of some medicinal plants used in South Africa for the treatment of wounds and retained placenta in livestock. SA J. of Botany, 73: 378–383.
- McKelvie L, Hamal K and Reynolds R (1993). Producer and consumer welfare effects of an invasion of screwworm fly in the Australian livestock sector. A BARE report to the Queensland Department of Primary Industries, Brisbane, Australia.
- Myiasis Wiki-vet (2011). Myiasis-causing flies, The Animal Health & Production Compendium (AHPC), published online by CABI during the OVAL Project.
- Ockenhouse, Christian, Samlaska, Curt, Benson, Paul, Roberts, Lyman, Eliasson, Arn, Malane, Susan, and Menich, Mark (1990). “Cutaneous myiasis caused by the African tumbu fly.” Archives of Dermatology 126: 199-202.
- Ogugua KO, Achufusi TG, Eme EO, Dorcas SB, Chika HA (2011) Human Myiasis in Neonates and Children of the Niger Delta Wetlands and South-East Nigeria. Journal of Cosmetics, Dermatological Sciences and Applications 1: 171-176.
- Otranto D, Traversa D and Giangaspero A (2004). Myiasis caused by Oestridae: serological and molecular diagnosis. *Parasitologia* 46 (1-2): 169-172.
- Otranto D, Traversa D and Giangaspero A (2004). Myiasis caused by Oestridae: serological and molecular diagnosis. *Parasitologia* 46 (1-2): 169-172.
- Palmer ED (1970). Entomology of the gastrointestinal tract: a brief review. Mil Med 135: 165-176.
- Papadopoulos E, Himonas C and Boulard C (1997).The prevalence of bovine hypodermosis in Greece. *Parasitologia* 39 (4): 431-433.
- Patton, W.S. (1922). Notes on the myiasis producing Diptera of man and animals. Bull. Entomol. Res., 12: 239-261.

- Phillips C.J.C (2009). A review of mulesing and other methods to control flystrike (cutaneous myiasis) in sheep; *Animal Welfare*, 18: 113-121.
- Rahman M. A., Hossain M. A. and Alam M. R. (2009). Clinical evaluation of different treatment regimens for management of myiasis in cattle. *Bang. J. of vet medi*; 7(2): 348 – 352.
- Sergio EB, José DE, Angel BC, Franklin C, Janina S, Sabina B and Enrique M (2007). Incidence of myiasis in Panama during the eradication of *Cochliomyia hominivorax*. Sección de Entomología Médica, Instituto Conmemorativo Gorgas de Estudios de la Salud, PO Box 0816-02593, Panamá..
- Sesterhenn AM, Pfützner W, Bräulke DM, Wiegand S, Werner JA, et al. (2009). Cutaneous manifestation of myiasis in malignant wounds of the head and neck. *Eur J Dermatol* 19: 64-68.
- Sherman RA (2000). Wound myiasis in urban and suburban United States. *Arch Intern Med* 160: 2004.
- Soyelu O.T. and Masika P.J. (2009). Traditional remedies used for the treatment of cattle wounds and myiasis in Amatola Basin, Eastern Cape Province, South Africa. *Onderstepoort Journal of Veterinary Research*, 76: 393–397.
- Trombetta L., Oliva A., Galache V., Bava J. and Troncoso A. (2009). Cutaneous myiasis due to *Cochliomyia hominivorax* in a drug user. *J Infect Dev Ctries*; 3(11): 873-876.
- Venugopalan, A. (2004). Wounds; Maggot wounds. *Essential of Veterinary Surgery*, 8<sup>th</sup> Edition: 46, 47.
- Zumpt F (1965) *Myiasis in Man and Animals in the Old World. A textbook for Physicians, Veterinarians and Zoologists*. Butterworth Co, London.
- "Standard Operating Procedures - sheep Mulesing". *teacher's notes* (2004). New South Wales Department of Primary Industries. Retrieved 2007-01-09.