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A Deep Dive into False Gid: The Neurological Nightmare

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Abstract

False Gid is a peculiar neurological complication arising from the infestation of the *Oestrus ovis* (Nasal Bot Fly) larvae in sheep. Bearing an uncanny resemblance to the dreadful disease caused by *Coenurus cerebralis*, it has been named as such. The condition is a type of myiasis that presents itself as a deviation from the normal life cycle of the parasite. The *Oestrus ovis* is a Dipteran fly belonging to the family Oestridae and suborder Cyclorrhapha. They are **protelean** parasites, with the larval stages being parasitic and adults being free-living. Although not common, these flies also pose a certain threat to humans living near their primary hosts and may cause accidental parasitism. This article discusses the parasite, its life cycle, clinical signs, diagnosis, treatment & prevention, and conclusion.

Keywords: oestrus ovis, false gid, sheep nasal fly, nasal bot fly, myiasis, protelean, parasites, ectoparasite, Diptera, cyclorrhapha, nasal sinus, instar, gid, sturdy

ETIOLOGY:

The *Oestrus ovis* is considerably one of the most special ectoparasites of veterinary importance in terms of its life cycle. Being an obligate parasite, it indicates that the ovine host is necessary to complete its normal life cycle. However, it has also been recorded to affect caprine hosts at times. The parasite has a worldwide presence (Özdal *et al.* 2016), with their populations concentrated in and around sheep-rearing premises. Owing to the advent of novel anti-parasiticides and biosecurity measures, their numbers have declined recently in developed countries.

Morphologically, they are dark-grey-coloured hairy flies with tarry spots on the thorax and abdomen. They resemble bees in their size. Females are larviparous, and the larvae moult through three stages or **instars**. The larvae can be identified by the **dark bands** on their dorsal surface and **spines** on their ventral surface.



Figure. Photograph by Lyle. J. Buss, University of Florida.

LIFE CYCLE:

The female flies are fast and are often attracted to pastures of grazing sheep. The sight of the fly culminates in a state of unrest among the sheep, and they become defensive. As the unaware sheep raises its head, the adult fly darts and larviposits around the nostrils, depositing about 2-20 larvae at a time. This first-stage larva, known as L1, moves deeper into the nasal passages while deriving nutrition from the mucoid **nasal secretions** of the host. Their spines aid in irritating the nasal mucosa, leading to heightened secretions. As its nutritional thresholds are met, the larva moults into the second-stage larva (L2). The presence of L2 larvae inside the host triggers the host immune system, and several immunoglobulins attack the parasite as a result. To escape its hostile environment, the larvae enter the **frontal** and **maxillary sinuses** of the host where the final molting takes place. The third larval instar (L3) then moves back through the nasal passages and is sneezed into the ground by the host. This generally takes about **25 days** but may be extended up to **9 months** in colder temperatures. On the ground, the larva pupates and an adult fly emerges in about **a month**.

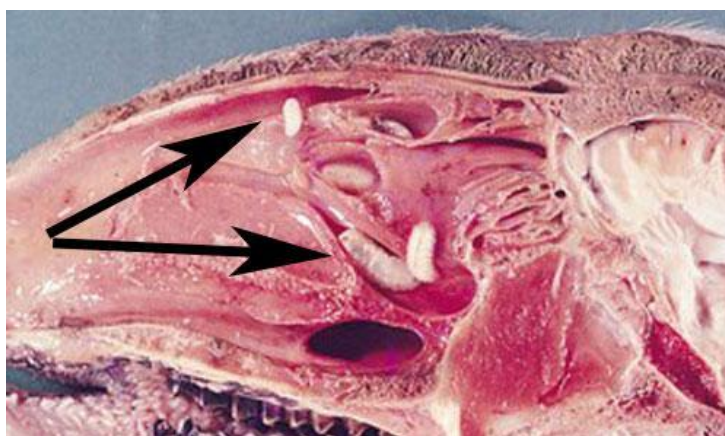


Figure. Photograph by Jack Lloyd, University of Wyoming.

COMPLICATIONS:

The normal life cycle of the parasite, although uncomfortable, is not life-threatening to the host and often goes unnoticed. Whereas, in case of nutritional deficiencies or concurrent diseases, complications might arise. At times, it also might be a **predisposing factor** for secondary bacterial infections. Death of the larvae inside the nasal sinus may lead to



calcification and septic sinusitis. The irritation of the nasal mucosa by the parasite is a tactic used for its nourishment and might lead to hypersensitivity or occlusion.

The prime complication arises when the L2 larva leaves the nasal sinuses and deviates into the brain instead, by eroding the cranial bones. This leads to the manifestation of lesions in the central nervous system, resulting in several neuropathological symptoms. The most notable of these signs are **blindness, ataxia, muscle tremors, listlessness, nystagmus and collapse**. There is also a **deviation of the head** and **circling movement** of the animal. These signs are characteristic of another disease called Gid/Sturdy caused by the metacestode *Coenurus cerebralis*. This is the sole reason why it is essential to differentiate these diseases while making a diagnosis. On the contrary to the life cycle discussed above, this condition is very severe and leads to neuropathological degradation of the host, commonly resulting in death. It is also to be noted that the life cycle of the fly is not completed in this complication, and this leads to the death of the larvae.

Another complication of the life cycle is manifested in the form of **ophthalmomyiasis** in **human** hosts. The shepherds, who live in close proximity to sheep, occasionally act as accidental hosts to the parasite, in which case, the larva burrows into the eyeball and causes severe irritation. **Blindness** is extremely rare but is a possibility when the internal structures of the eyes are damaged by the larvae. Surgical intervention by a medical doctor is required in this condition.

CLINICAL SIGNS:

A case of false Gid usually presents with the following signs and symptoms:

- Frequent Sneezing
- Dirty Nasal Orifice (**Snotty Nose**)
- Frequent Shaking of Head
- Ataxia
- Muscular tremors
- Listlessness
- Nystagmus
- Blindness
- **Circling**
- Collapse
- Death

DIAGNOSIS:

While dealing with a case of false gid, one would need to differentiate it from several other neuropathological conditions. The presence of *Oestrus ovis* larvae along with **nasal**



discharge in the cavities of affected animals is of confirmatory value. To differentiate it from a case of Gid, the veterinarian must ensure that there are no metacestodes (bladder worms) present in the brain and spinal cord.

General panic and gadding-related injuries in a flock of sheep might be implying the presence of *Oestrus ovis*. Moreover, a decrease in the productivity of the animals due to parasite-induced stress must be coupled with other symptoms while arriving at a diagnosis.

The frequent shaking of the head in infected sheep, along with the dirty appearance of the nasal region (**snotty nose**) are invaluable diagnostic signs. Further, the infected animal sneezes frequently and exhibits a wide array of neurological signs, as mentioned previously.

TREATMENT & PREVENTION:

In case of the advancement of the disease into false gid, the animals never recover completely and might collapse in the process. The treatment protocol for *Oestrus ovis* infestations is as follows:

- Administration of **1-4% Hexachlorocyclohexane (HCH)** insecticide in oil as nasal instillation
- Organophosphate insecticide
- 1% w/v Coumaphos
- **Rafoxanide** (7.5 mg/kg) as drench
- **Ivermectin**
- **Closantel**

Prevention is the primary goal in safeguarding animals from *Oestrus ovis* infestations. The prophylactic measures include:

- Feeding of sheep in narrow troughs.
- Smearing the edges of feed troughs with tar (fly repellent).
- Applying natural and synthetic repellents on the susceptible sheep (such as neem oil).
- **Prophylactic treatment with a combination of Ivermectin and Closantel.**

It is to be taken into consideration that rotation between different treatment products is followed in order to prevent resistance buildup in *Oestrus ovis* (Carvalho et al. 2015).

CONCLUSION:

All in all, the neurological nightmare known as false gid is an extreme variant of the disease, caused by the exacerbation of normal parasitism. The failure to complete the fly's life cycle harms both the host and the larvae residing within it. A successful life cycle depends on a myriad of factors, and these factors serve as checkpoints for health workers to tap into and intervene as preventive measures. Stringent biosecurity coupled with prophylactic planning could prove paramount in sheltering the ovine population of a country from this tormenting



disease.

“The greatest wealth a country can have is its health, and the greatest health any animal can have been its freedom.” -Dr. Bernard Rollin

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