

Agalactia in animals: A Clinical Perspective

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About the disease:

Agalactia is the total loss of milk production in animals otherwise capable of lactating. It represents either a failure of milk production or failure of milk let down. Agalactia can result from either a single etiology or a combination of multiple etiologies and can manifest itself as either acute agalactia or chronic agalactia.

It is seen across many animal species aside from cattle. It can be affected to any age group of the lactating cows, though the young lactating cattle are more vulnerable. In post parturient sows, it appears alongside mastitis and metritis and is known as **MMA syndrome** (Mastitis, Metritis and Agalactia) (Gooneratneet *et al.*, 1982). **Contagious Agalactia (CA)** in small ruminants is another serious disease which affects lactating females and their young ones causing significant mortality (Corrales *et al.*, 2007). Hypogalactia or Dysgalactia involving partial loss of milk production, which is more frequently seen in herds on a routine basis. Agalactia, thus, has the potential to cause huge economic losses to the farmer, if not timely managed.

Lactation physiology:

Lactation is the result of the interplay between various hormones. Prolactin secreted from the anterior pituitary gland during pregnancy and placental lactogen in cattle are the main hormones responsible for the synthesis of milk in the mammary gland. Prolactin is, in turn, regulated by the hypothalamus by the release of prolactin releasing hormone and prolactin release inhibiting hormone which stimulate and inhibit the secretion of prolactin from pituitary respectively (Bhimteet *et al.*, 2018).



Oxytocin from the posterior pituitary is responsible for causing the let-down of milk in lactating females which is induced during suckling of milk by the new born calves. In agalactia, such hormonal balance is disturbed.

Etiology:

Various causes based on poor management, nutritional deficit, parasitic infestations, local and systemic infections interfere with lactation as mentioned below (Singh, 2020).

- Nutritional deficiencies
- Let down issues (calf death)
- Heat stress and drought
- Systemic infections (bacterial, viral, parasitic, mycoplasmal)
- Hormonal imbalance
- Mastitis
- Udder edema
- Endometritis
- Toxins and Pesticides ingestion (e.g., ingestion of endophyte infected fodder that contains ergot alkaloids may cause suppression of prolactin release)
- When the animal is in estrus (physiological cause)

CA in small ruminants is caused by *Mycoplasma agalactiae* (Jay and Tardy, 2019). *Streptococcus agalactiae* and *Streptococcus dysgalactiae* are found to be the major bacterial causes of mastitis associated agalactia in large ruminants.

Clinical signs and symptoms:

Main sign is the absence of milk secretion upon milking or suckling by the calves. Poor udder health and shrinkage in the udder size is also seen. Mastitis, soreness of teats and obstruction of the teat canal is oftentimes seen with agalactic animals suffering from infectious causes. Contagious agalactia in small ruminants results in mastitis, arthritis and conjunctivitis. Further, other signs like fever, loss of appetite, lethargy or weakness can be seen.

Diagnosis:

The condition can be diagnosed upon observing the animal daily for its milk production. The owner will report suboptimal or total lack of milk secretion. In the infectious causes of agalactia, culturing of the organism further corroborates the diagnosis. Serological techniques like ELISA can be used to detect antibodies in cases of CA (Corrales *et al.*, 2007). If the herd has been vaccinated for mycoplasma, then molecular techniques like PCR can be employed.

Prevention and control: revolve around maintaining a sound environment, healthy milking and feeding practices.

1. **Environment:** Fomites and unsanitary conditions are largely responsible for the spread of infectious agents. Hence, cleanliness in the immediate environment with regular change of bedding should be undertaken routinely to ward off infectious causes of agalactia. The shed should be routinely monitored for optimal temperature and adequate ventilation to prevent heat stress.
2. **Milking practices:** Hygienic practices of milking should be strictly followed. Teat dipping should be followed post milking to kill infectious pathogens (Edmondson, 1998). Poor udder health can be seen in infectious cases which can eventually cause fibrosis and obstruction of the teat canal.
3. **Nutritional supplementation:** Maintenance of appropriate feeding schedules and routine fortification of feed with minerals and supplements help in encouraging lactogenesis.

In the contagious causes of agalactia as seen in small ruminants, control is aimed at reducing the economic losses and severity of the disease impact which can be achieved by disinfection of the environment, teat dipping before and after milking, isolation of affected animals and selective culling (Jay and Tardy, 2019). Healthy quarters should be milked first before infected quarters. Vaccination is also practiced as a control method in cases of CA in small ruminants albeit with varying efficacy.

Line of treatment:

Treatment is centered on effectively combating the etiological factors. When the nutritional state of the animal is compromised, feed additives (mineral mixtures, vitamins etc.) and galactogogues should be prescribed.

In contagious agalactia, intra-mammary antibiotic infusions can be given. Hot fomentation with magnesium sulphate is recommended to relieve inflammation of teats. In order to ensure complete let down of milk and to assist flushing out of inflammatory debris, oxytocin can be given.

It may be concluded that Agalactia could be caused by a variety of etiological factors and accordingly, its treatment and prevention can be achieved by addressing these causes. Nutritional supplements and managerial practices appear to play a major role in preventing this condition which can cause huge economic losses to the dairymen.

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