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Mastitis-Metritis-Agalactia Syndrome in Andaman Local Pig-First Case Report

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Abstract

Mastitis-Metritis-Agalactia (MMA) syndrome causes huge economical losses in the swine industry. Andaman local sow aged 3 years with the history of farrowing 18 days ago and complaint of anorexia, restlessness and inattentive towards her piglets, agalactia and lameness was presented with the elevated rectal temperature, congested mucus membrane, swollen painful mammary glands with foul smelling muco-purulent vulval discharge. Based on the visible clinical signs, sow was tentatively diagnosed as suffered from mastitis-metritis-agalactia syndrome. The affected sow was treated with ice fomentation, cleaning with liquid soap, application of Lugol's iodine solution and antiseptic ointment on the udder, injection of gentamicin, streptopenicillin, non-steroidal anti-inflammatory drug, prostaglandin F2α, intrauterine infusion of normal saline followed by Lugol's iodine solution along with supportive therapy with multivitamin and hydrotherapy in water bath. The pig was fed with boiled chicken eggs for supports to her health. The piglets were fed with toned cow milk during the treatment regimen along with creep feed. On day 3rd post treatment, the sow was recovered and allowed the piglets to suckle. Thus the quick diagnosis and prompt treatment saved the pigs from the life threatening syndrome along with eliminating the pre-weaning piglet mortality. The MMA prevalence could be reduced through optimization of husbandry, feeding and managemental practices. This is first report of MMA syndrome in Andaman local pig in Andaman and Nicobar Islands that too affected after 18 days of farrowing.

Keywords: Andaman local pig, mastitis-metritis-agalactia syndrome, treatment and prevention, case report

Introduction

Pig rearing is an important component of animal husbandry in Andaman and Nicobar group of Islands (ANI). Among the indigenous livestock species, pig occupies 27.26% of the total livestock in Andaman and Nicobar Islands (Kundu *et al.,* 2017) and is associated with the socio-culture-economic-tradition of tribals. Being a prolific breeder, it is gaining popularity as a protein rich meat animal in ANI among the tribals and non-tribals. Several managemental and husbandry practices influence the incidence of diseases in pig farms, out of which, MMA syndrome is a wide spread disease complex of pig with multiple etiology. The disease lasts for a minimum of 3 days and then resolves spontaneously. By this time, the litter may have been lost due to severe piglet mortality through starvation and an increased susceptibility to other fatal diseases of the newborn. This inflicts considerable economic loss to pig farmers.

Infectious organisms like *E.coli*, *Streptococci* sp., *Staphylococci* sp *etc.* are involved in MMA syndrome (Gerjets and Kemper, 2009). Lack of exercise or close confinement, filth, chilling of sows at farrowing time or it is more severe in hot weather, imbalanced endocrine factors and toxic factors have contributory roles in the causation of the disease (Roberts, 1971). The typical disease occurs in very early stages of lactation, within 12-48 hours to several days after farrowing and is characterised by anorexia, restlessness, inattentive to her piglets, fever, agalactia, painful swelling of mammary glands (Radostits *et al.,* 2007). It was reported that 20-25% of pre-weaning piglet loss is due to this MMA syndrome (Kumaresan *et al.,* 2006).

Case History and Observations

A sow with the history of anorexia, restlessness, inattentive towards her piglets, fever, agalactia, painful swelling of mammary glands at day 18 of post farrowing was attended in pig unit, AICRP on Pig, ICAR-CIARI, Port Blair. The sow farrowed 9 piglets 18 days ago. The animal was very weak and was in sternal recumbency. Rectal temperature was recorded as 105.0°F. On examination,

visible mucus membranes were highly congested. There was swelling of the mammary glands with evidence of pain on palpation. Muco-purulent vaginal discharge was noticed with fetid smell. The case was tentatively diagnosed as MMA syndrome based on the clinical signs and examination carried out.

Treatment and Discussion

The treatment protocol is depicted in the figures 1-5. The treatment was started with Streptopenicillin 2.5 g IM daily in two divided doses and Phenylbutazone @10 mg per kg BW twice daily for three days. Prostaglandin F2α, cloprostenol@100mcg total dose, intramuscular was given on the 2nd day. Intrauterine infusion of normal saline followed by Lugol's iodine solution was done. Supportive therapy comprising multivitamin injection was continued for three days. Treatment of mastitis was carried out with ice fomentation, washing of the udder with liquid soap, application of povidone iodine solution and antiseptic ointment on udder daily for three days. Concentrate pig feed was supplied with six boiled eggs daily for 3 days. The sow was allowed to enter in the water dip. The piglets were separated and fed with cow milk. The sow recovered uneventfully and fed milk to the piglets.

Fig. 1. Cleaning of the infected udder with liquid soap

It has been reported that multiple infectious agents, imbalance of endocrine and nutritional factors are involved in causing MMA in pigs. Therefore, administration of antibiotics and anti-inflammatory agents might enhance the quick recovery whereas PGF2α causes contraction of the uterus and expulsion of pus (Kumaresan *et al.,* 2009). Thus, it may be indicated that administration of Streptopenicillin with phenylbutazone and PGF2α/ oxytocin is effective treatment regimen in the treatment of MMA in sows.

Fig. 2. Dressing of the infected udder with Povidone Iodine solution

Fig. 3. Washing the infected uterus with normal saline solution

Fig. 4. Intra-uterine treatment of the infected uterus with Lugol's iodine solution

Fig. 5. Hydrotherapy treatment for the infected inflamed mammary glands

MMA causes severe economical losses in the global swine industry. The disease complex can be present at farrowing time or it can appear within several days after parturition. The aetiology of syndrome includes endotoxins and generally the gram negative and some positive bacteria (*Colibacteroides*, ß-*Haemolytic Streptococci* G and L, Staphylococci, *Arcanobacterium pyogenes, Proteus, Bacteroides, Clostridium* and *Haemophilus).* Moreover, several aetiological agents of functional hypoagalactia/ agalactia are factors associated with stress of sows and conditions that contribute in the proliferation of bacteria and consequently in the potential endotoxemia (cystitis, metritis, vaginitis, constipation and mastitis) seem to play a significant role. Risk factors are often suspected for MMA are health status of sows (fat sow syndrome, extended duration of parturition, post-partum pyrexia, teat malformation and injuries and hypoplasia of mammary glands), the housing and management conditions of the sow around its parturition (slippery floors, hygiene, temperature humidity index of rooms, reduced activity of the sows, watering system) and diet composition (concentration of fiber, proteins, vitamin E and selenium). The clinical signs are characterized mainly by disorders of lactation and health status of sows (anorexia, depressed attitude, pyrexia, rapid breathing, reluctance to move about or to allow nursing, constipation and abnormal postpartum vulval discharge) as well as from decreased litter performance (unsuccessful attempts for suckling, intense discomposure, diarrhoea, poor growth rates, unevenness of litters regarding to body weight of piglets, increase of pre-weaning mortality).

Mammary glands are more frequently involved in the MMA syndrome than any other body part in sow and amount of involvement differs from only one gland to the entire udder. The affected mammary glands are enlarged, more firm, warmer, and highly sensitive and often are discoloured when compared to other glands. Careful palpation of the mammary glands of each sow several times during the early postpartum period may reveal developing hypogalactia/agalactia and allow for early treatment in the syndrome. Primary hormones in mammogens such as estrogens, progesterone and prolactin along with different direct and indirect synergistic hormones are important in development and secretion of milk by mammary glands (Holtz *et al.,* 1983). Each of these hormones must be secrete at right time in right amount to initiate, stimulate and maintain the lactation. Any factors which altering the concentration of these hormones such as environmental stress (higher THI), lack of proper nutrition, bacterial infections or endotoxins or improper preventive injections can affect lactation. On the other hand, other body tissue alterations such as swelling, redness and haemorrhages in the tissues in and around the mammary glands, associated lymph glands/nodes, kidneys, synovial membranes, adrenal glands and pituitary gland can cause severe adverse effect on lactation. It is unknown that whether the genetics has played important roles to induce this disease, but stress-susceptible and stress-resistant lines have been identified and susceptible lines seem to have more agalactia problems than the stress-resistant.

Diagnosis of the disease complex usually is not much difficult. However, the finding the etiological factors in many of the cases is difficult. Differential diagnosis should be done with MMA syndrome from other diseases such as transmissible gastroenteritis or pseudorabies to conduct effective treatment and control measures (Sujatha *et al.,* 2003). Diagnosis is to be done with evaluation of history, observation of symptoms, palpation of sow mammary glands plus postmortem examination of one or several pigs usually will allow for a definitive diagnosis. Culturing of milk samples should be considered and if done, can reveal valuable information about a particular sow herd and this cultural examination need to be conducted periodically in the herd to find the prevalence of the infectious agents in the farm.

The prognosis for the life of the affected pig is good. The prognosis for the complete return or establishment of normal lactation is guarded; however, this will take some time. The affected sow usually recovers in two to five days with or without lactation function. Having the disease once does not mean that the sow will develop agalactia on subsequent farrowings. Unless sow lactation is rapidly re-established or supplemental feeding is successful, the chances for piglet survival are low. The effects of chilling, diarrhea and other baby pig diseases must be fully considered (Gooneratne *et al.,* 1982).

Treatment for affected sow must be directed towards the establishment of milk flow to help in sustaining life of the baby pig and prevention of secondary complications in both sow and piglets. Treatment with oxytocin is superior to any other treatment and which allow releasing the milk within the mammary glands that will be taken by the hungry piglets if the pig is strong enough to nurse. Corticosteroids can also be advisable to give to the affected sow for reducing the inflammation and minimizing the recovery period. Anti-bacterial agents should be used in treating the affected sow. Injectable mild, slow acting laxatives are indicated for the constipated sow. Use of vaginal or uterine infusions, douches or pessaries of antibiotics or Lugol's iodine to combat suspected uterine infections may stimulate a neuro-hormonal reflex action that could result in posterior pituitary release followed by increased contraction and expulsion of pus (Peter *et al.,* 2007).

Some MMA outbreaks are thought to have been human-induced by noise factors, schedule irregularities, etc. Gestational feeding of sows has significant influence on prevalence on agalactia. Apparently underfed sow cannot maintain sufficient blood glucose levels than the adequately fed sow; therefore, resistance may be lower in the underfed sows. Additives to reduce mammary gland edema might be considered in some herds. The mixture of 12 parts potassium nitrate, 4 parts methenamine and 1 part dicalcium phosphate by weight, given at the rate of 28 grams twice daily for one week prior to and one week following farrowing may be helpful to reduce the mammary edema.

Treatment must always include supplementary dietary support for the pigs because they have small energy storage capabilities; therefore, nourishment is critical for sustained life. Supplemental heat (29°-32°C) for piglets during the first few days is energy conserving to them and will aid in survival as a part of routine treatment or prevention. Prevention of this MMA syndrome is by proper maintenance of herd health and proper nutrition. Immunization is advisable and it must be done in advance of anticipated problems such as bacterial mastitis. Cultures from infected milk of sow can be used to prepare a bacterin. Those pig herds where bacterial mastitis occurs frequently may benefit from immunization if other management practices will not overcome the problem. Efforts should be taken to minimise the stress throughout gestation and during parturition and post parturient periods as the important preventive measures. However, further investigation is needed to assess the incidence of MMA syndrome in field condition and analysis the endocrinological and biochemical profiles in the affected indigenous Andaman local pigs and Nicobari pigs.

Conclusions

Mastitis-Metritis-Agalactia syndrome causes huge economical losses in the global swine industry. The condition can be treated with suitable antibiotics, anti-inflammatory agents, oxytocin and suitable intrauterine infusion along with supportive therapy. Therefore, quick diagnosis and prompt treatment are important to save the pigs from the life threatening syndrome along with eliminating the pre-weaning piglet mortality. Moreover, incidence of MMA syndrome could be reduced through optimization of husbandry, feeding and management.

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