

SURGICAL CASTRATION OF PIGLETS AND ITS POSSIBLE ALTERNATIVES FROM THE PERSPECTIVE OF A VETERINARIAN

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Castration of male piglets is a routine and one of the most common procedures performed on piglets in production farms. Therefore, it is constantly the subject of much attention, both in relation to animal welfare and to improving the work management of farm staff and veterinarians. The procedure itself may be carried out by a veterinarian, a veterinary technician, or a professionally qualified person. Up to their 7th day of age, according to the legislative standards applicable in the Czech Republic, this procedure can be performed without the use of any kind of anaesthesia or analgesia; however, as of 2018, we, along with other EU member states, have committed not to perform it without the use of anaesthesia. Conversely, some countries, especially in South America, use boar taint vaccination (the product available in the Czech Republic is called Improvac) as a possible alternative to the surgical castration of piglets. Nevertheless, this method is relatively expensive and time-consuming. Considerate methods of piglet castration using anaesthetics, analgesics and anti-inflammatory drugs are supported by the Ministry of Agriculture in a special subsidy programme where breeders can receive a contribution of up to CZK 23 per piglet up to 7 days of age.

Key Words: Piglet; castration; anaesthesia

Anaesthesia available for pigs can be categorised as general (anaesthetics and sedatives, tranquillisers) and local. In the Czech Republic, the only registered sedative contains *azaperonum* and the registered general anaesthetic products contain *ketaminum*. Local anaesthesia can be performed using substances containing *lidocainum*. No oral tranquillisers are registered in the Czech Republic for use in pigs.

Among analgesic agents, i.e. substances that only relieve pain, there is only one substance registered in the Czech Republic for pigs, namely *metamizolum*, which has no anti-inflammatory effect. However, non-steroidal antiflogistics are commonly used for analgesia, which, in addition to their anti-inflammatory effects, also act against swelling and pain (preparations containing *flunixinum*, *ketoprofenum*, *meloxicamum*, etc. are available in the Czech Republic).

Foreign sources indicate that the most considerate form of administration of anaesthetics and pain or nervous system depressants is *per os*. Such preparations, however, are not registered in the Czech Republic for use in pigs intended for human consumption.

In our studies, we decided to compare the listed preparations based on their effect and availability, taking into account animal welfare.

We used both injectable and peroral forms of the preparations and different routes of administration:

Intramuscular (into the neck muscles) - *azaperonum* i.m.; a combination of *diazepamum* and *ketaminum* i.m.; a combination of *dexmedetomidinum hydrochloridum* and *ketaminum* i.m.

Intravenous (into *vena auricularis lateralis*) - a combination of *dexmedetomidinum hydrochloridum* and *ketaminum* i.v.

Intraperitoneal - *thiopentalum natricum*

Local form of analgesia/anaesthesia with *lidocainum hydrochloridum*, administered directly into the spermatic cord.

Peroral - *dexmedetomidinum hydrochloridum* p.o. and *tasipimidinum sulfas* p.o.

Azaperonum and *ketaminum* are the only substances registered for pigs intended for human consumption.

Thiopentalum and *diazepamum* are preparations intended for use in humans, where a minimum meat withdrawal period of 28 days must be observed.

Inhalation anaesthesia has not been described because it is not commonly used in our conditions as it induces stress in pigs and is more expensive. The preparations used orally were an important part of the study in terms of animal welfare. *Dexmedetomidinum hydrochloridum*, which is commonly used for its sedative effect in dogs and cats, and *tasipimidinum sulfas*, which is used to suppress anxiety and fear in dogs, were the substances used. They induce tranquillisation or mild sedative effects, and their route of administration *per os* does not cause a painful reaction and therefore stress equivalent to parenteral administration of anaesthetics or analgesics. These substances are only registered for use in small animals (dogs, cats, and rodents). However, foreign sources mention their effective use in porcine medicine.

Dexmedetomidinum hydrochloridum belongs to the group of $\alpha 2$ -adrenergic receptor agonists. Depending on the dose, it induces varying degrees of sedation, respiratory depression, bradycardia, hypotension and, rarely, ventricular arrhythmia. The peroral form of *dexmedetomidinum hydrochloridum*, an oral gel, is used in the preparation called Sileo, which is a gel intended for transbuccal or transgingival application in dogs to suppress fear and induce a mild sedative effect. The preparation is administered on the oral mucosa between the dog's cheek and gums. Access to food or milk should be prevented for the first few minutes.

When applied directly *per os*, the effect of the preparation is significantly lower or even not effective at all. Disposable gloves should be used during administration to avoid direct contact with the skin. The effect should occur within 30 minutes and last up to 120 minutes.

Tasipimidinum belongs to the group of selective $\alpha 2$ -adrenergic receptor agonists and forms a component of a peroral solution intended for direct application *per os*, i.e. so-called Tessie. The product is administered in the fasted state and the effect occurs within 60 minutes, with the possibility of repeating the dose after 180 minutes. Depending on the dose, it lowers blood pressure and body temperature.

The experimental animals were monitored at intervals of 0, 30, 90, 240 minutes after application. We observed the animals' reactions during sedation/anaesthesia, the procedure, and also their awakening from anaesthesia. The rate of onset and duration of different types of sedation/anaesthesia were also described.

Castration was performed using the standard procedure - restraining the piglet by holding it in the arms, disinfection of the scrotum, two vertical incisions, removing the testicles from the scrotum, crushing and cutting the spermatic cord using an emasculator, disinfection, and wound inspection.

General anaesthesia, such as any combination with ketamine, is ideal for inducing deep anaesthesia and analgesia (including those with dexmedetomidine), but the wake-up time is too long, it causes stress to the piglets mainly due to the inability to drink colostrum/milk and may result in hypoglycaemic hypothermic shock.

Peroral preparations appeared to be ideal from the point of view of administration to piglets and welfare. In terms of the effect achieved, they were the least effective and therefore suitable for use prior to castration. The group of piglets treated with *dexmedetomidinum* showed only a slight sedative effect and reacted to castration in the same way as the group not treated with any agent.

The group of piglets treated with *tasipimidinum* showed no sedative effect and the tranquillising effect described following application of this preparation to pets, especially dogs, was not achieved.

Lidocaine appears to be the most suitable alternative of the agents used in terms of stress levels for piglets and its effect on them. In terms of effect, local anaesthesia seems to be sufficient for castration. The disadvantage of this type of anaesthesia is the time necessary to achieve an effect, about 3-5 minutes, which is not effective enough in livestock production.

Conclusion

It is clear that castration of piglets without any kind of anaesthesia or tranquillisation stresses them. On the other hand, this standard procedure, which has been performed for decades, only takes tens of seconds and it is proven that small piglets (2-3 days after birth) have a lower pain threshold. The benefit of all the gentle methods used in castration must then be considered, especially with regard to general anaesthetics, which carry a number of risks to the health and future production parameters of suckling piglets.

Picture 1. Application of *dexmedetomidinum*



Picture 2. Application of *tasipimidinum*



Picture 3. Fixation of testicles before incision and incisi-



Picture 4. Use of emasculator



Picture 5. Castration wound



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