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Effect of Xylazine Sedative on Propofol Anaesthesia in pigs

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Abstract
To identify the cardio-respiratory changes caused by propofol anesthesia in pigs, the effects were investigated. Six adult male pigs weighing an average of 21 kg and aged 8 to 12 months were divided into groups A and B.
Propofol was supplied to group A animals at a rate of 5.5 mg/kg, whereas xylazine at a rate of 0.5 mg/kg was given to group B animals, followed by propofol 5 minutes later. Heart rate, pulse rate, respiratory rate, and rectal temperature were measured as cardiorespiratory parameters. Although a drop in heart rate was seen, it was not statistically significant because the p value was higher than 0.05 (P>0.05). After comparing the controlled value's mean value to the sample mean value, it was discovered that there was an increase in respiratory rate.
There was statistically no significance for the value of (P>0.05). This study demonstrated that xylazine plus propofol anesthesia generated a smooth onset and good muscle relaxation in pigs during this trial.

Keywords: Pigs, Propofol, Xylazine, Sleeping pattern

1. Introduction
As long as pig farming thrives, sporadic surgical treatments cannot be ruled out. Such surgical operations are even becoming more common, and this is attributable to pigs' eating habits as well as the fact that there are more pig farmers in the research locations now than there were a few years ago. Any surgical procedure's effectiveness largely rests on the anesthetic agent's capacity to deliver the desired results of tranquility, muscular relaxation, and pain alleviation. Animals can't cooperate with some diagnostic or therapeutic procedures and are utilized as animal models, thus anesthesia is employed for a wider range of situations in them than it is in humans. The foundation of contemporary general anesthesia is the capacity to deliver sufficient analgesia during surgical procedures. By causing significant muscle relaxation, neuromuscular-blocking medications can be used to facilitate surgical exposure. Anaesthetic drugs come in a variety of forms with various action and effect mechanisms. One medicine or a mixture of drugs might be used to achieve anesthesia, thus it is important to choose those that will produce the desired effects. An intravenous sedative-hypnotic drug having amnestic characteristics, propofol quickly and consistently renders the subject unconscious (Larson, 2005; Astra 2003) [10, 1]. A strong analgesic with a long history in animal and veterinary research, xylazine.
The intravenous anesthetic propofol has been used on a variety of animal species, including dogs and cats (Matth 1999; Skues 1989) [8, 9] when used alone, some anesthetics do not cause surgical anesthesia in pigs, but when combined with other medications, they can produce anaesthesia strong enough for any significant surgical procedures. In order to ascertain the pattern of anesthesia caused by propofol alone and propofol in combination with xylazine as a premedicant, this study compares the effects of both.

2. Materials and Methods
2.1 Animals
For the study, six male indigenous pigs between the ages of 8 and 12 months were obtained from a farm in Agan village and North Bank market, both located in Makurdi local government area, Benue state.

The animals were housed in the Federal University of Agriculture's Veterinary Teaching Hospital Annex in Makurdi. The animals weighed an average of 21 kg and were marked for proper identification. Kitchen trash served as their three meals a day, and unlimited water was available. The animals underwent a complete physical examination for ectoparasites, and samples of their feces were tested for helminth infection. Ivermectin (0.4 mg/kg) was administered subcutaneously to the animals who tested positive for nematodes by coproscopy, and they were then given two weeks to acclimate before the trial began.

2.2 Preoperative assessment
A baseline clinical examination (rectal temperature (RT), heart rate (HR), respiratory rate (RR), and thoracic auscultation), as well as a routine examination (full blood count, and biochemical profile), were carried out on the animals to make sure they were in good health. All of the participants' clinical measures were within normal limits, and they all appeared to be in good health and showed no clinical symptoms. Weeks before to the start of the experiment, the animals were given an overnight fast from food and drink, and an anesthetic agent or agents were administered six hours later.

2.3 Drugs
The medications were bought at the Veterinary Teaching Hospital's pharmacy at the Federal University of Agriculture in Makurdi. There were utilized the following drugs:

- The propofol hydrochloride that Celon Labs PVT.LTD, an Indian company, produces and sells.
- Xylazine produced in the Czech Republic by Bioveta Ivanovice na Hane.

2.4 Experimental Procedure
Two groups of three animals each were divided among the animals. Animals in Group 1 received 5.5 mg/kg of propofol intravenously, while those in Group 2 received 0.5 mg/kg of xylazine intramuscularly followed by 5.5 mg/kg of propofol intravenously five minutes later. The time that was kept track of for the onset, duration, and recovery from anesthesia. Following the administration of propofol, the lack of toe reflex was used to detect the beginning of anesthesia.
The baseline vital signs were appropriately measured with the right equipment and recorded every 15 minutes for 75 minutes, starting at 0 minutes.

3. Results
The impact of propofol alone on vital piglet parameters is shown in Table 1. Ten minutes after injection, there was no discernible variation in temperature, heart rate, pulse rate, or respiration rate (P>0.05).
The impact of premedicating propofol with xylazine on key piglet parameters is shown in Table 2. After administering propofol premedicated with xylazine, the animal's temperature increased significantly (P>0.05) after 30 minutes as it began to regain consciousness, but its heart rate and respiration rate remained unchanged.

Table 1: The effects of propofol alone on vital parameters

Parameter	MEAN±SD 0 Minutes	MEAN±SD 10 Minutes	P Value
Temperature	38.90 ±0.4	39.37 ±1.0	0.184
Heart Rate	109.33±9.2	102.67±12.2	0.130
Pulse Rate	97.33±6.1	89.33±6.1	0.597
Respiratory Rate	50.67±12.8	69.33±8.2	0.184

P<0.05 When compared with control

Table 2: Effects of propofol premedicated with xylazine in pigs

Parameter	0 Minutes	15 Minutes	P-Value	Time 30 Minutes	P-Value	45 Minutes	P-value	60 Minutes	P-value	75 Minutes	P-value
Temperature	37.77.0	38.50±1.7	0.227	39.20±0.5[a]	0.040	39.52±0.4[a]	0.047	39.73±1.4[a]	0.018	39.60±0.9[a]	0.004
Heart Rate	102.67±12.2	94.67±16.1	0.670	88.00±10.6	0.341	77.33±2.3	0.089	82.67±4.6[b]	0.049	90.67±8.3[b]	0.408
Pulse Rate	104.00±8.0	94.00±7.2	0.370	60.00±52.9[b]	0.335	77.33±2.3[b]	0.017	76.00±4.0	0.020	89.33±6.1	0.187
Respiratory Rate	38.67±6.1	34.34±5.1	0.499	33.33±8.3	0.547	33.33±10.1	0.547	33.33±12.9	0.578	36.00±14.4	0.480

a=significant increase
b=significant decrease
P<0.05 When compared with control

4. Discussion
When the impact of propofol anesthesia on temperature was examined, the results revealed an increase in mean temperatures that is statistically insignificant (P>0.05) but nevertheless evident. In line with Kurz (2001) [7], whose research showed that hypothermia is a frequent and significant consequence of general anesthesia.
Heart rate was seen to decrease, but because the p value was higher than 0.05 (P>0.05), there was no statistically significant difference. This is consistent with Gimenes *et al*. (2011) [5].'s study in which the effects of propofol on the heart were assessed in dogs, showing a non-significant drop in heart rate. However, the data does not support Hyun *et al*. (2000) [6].'s observation that an increase in heart rate in people.
When compared to the controlled value, the mean value of the pulse rate decreased. According to statistics, the decline is not insignificant.
After comparing the controlled value's mean value to the sample mean value, it was discovered that there was an increase in respiratory rate.
There was statistically no significance for the value of (P>0.05). The findings of this study on respiratory rate concur with those of Allweiler *et al*. (2010) [2].
The outcome, however, differs from other studies; for example, propofol is claimed to impede respiratory drive and degrade patient-ventilator synchrony to a degree that varies with the amount of sedation (Liu *et al*., 2017) [11].
When used as a premedicant for propofol, xylazine caused a

rise in body temperature. Given that the P value was found to be more than 0.05 (P>0.05), this temperature increase is not statistically significant. When xylazine was utilized as a pre-medication and propofol was used to anesthetize the pigs, the results on the heart rate showed a decrease. However, the decrease is statistically non-significant. This is consistent with the findings of Frias *et al*. (2003) [4], who found that horses' blood pressure did not change much over time. Following the injection of xylazine and propofol to pigs, the mean pulse rate was found to have reduced. This has statistical importance.
This drop in respiration is statistically significant because a p value of less than 0.05 (P0.05) was achieved. It was seen that the respiratory rate decreased, with the mean value suggesting that there was depressed respiration.

5. Conclusion
In conclusion, when compared to the administration of propofol alone, the combination of xylazine/propofol provided anaesthesia induction, muscular relaxation, and analgesia appropriate for targeted surgical procedure (gastrotomy). Thus, we advise using xylazine and propofol together for surgical procedures.

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