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A retrospective study of post-operative protocols used in canine, porcine and small ruminants surgically handled in the University of Nigeria Veterinary Teaching Hospital between January 2010 - December 2019

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Abstract

Post-operative management is the care a patient receives after surgery which usually lasts through the entire duration of hospital stay and after discharge following total recovery. This research was carried out to investigate post-operative protocols used in canine, porcine and small animal ruminants surgically managed University of Nigeria Veterinary Teaching Hospital between January 2010 to December 2019. Case files of patients presented and treated were studied. During this period, a total of 2526 animals were treated. Of these number, a total of 63 case files were studied because they were surgical cases and 2463 were not studied (non-surgical cases). The information obtained included: file number, species and sex. Also, anaesthetics and post-operative antibiotics, post-surgical analgesics and fluid use were studied. The proportion of cases presented with an indication of surgery varied greatly among species: canine (1.65%), caprine (0.63%), ovine (0.02%) and porcine (0.04%). The proportion also varied significantly between surgical and non-surgical cases with the non-surgical cases ranking higher than surgical cases. The proportion also varied between males (0.83%) and females (1.69%) in all species studied. Caesarean operation (0.63%) was the most surgical procedure performed. Lignocaine, penicillin streptomycin and Acetaminophen were the most used anaesthetic, antibiotic and analgesic respectively. Dextrose saline (0.12%) was used in the majority of patients. This study established that indications for intravenous fluid, anaesthetic, analgesic and antibiotic were strongly associated with the species and health status of the animals with choices of therapy based on availability and judgement of the clinician.

Keywords: Analgesic, antibiotics, anaesthetics, fluid therapy.

Introduction

In veterinary clinics and hospitals, patients presented for treatment may require surgery (Eide, 2000). Surgery is often performed on animal patients to correct anomalies, treat

diseases, diagnose ailments or for cosmetic reasons (Abusara and Abdelgardir, 2014). Studies have shown that patients may experience post-surgical complications ranging from severe to moderate pain, anaesthetic emergencies, wound infection, wound dehiscence, hypothermia, hypovolaemia and cardiopulmonary disturbances (Giordano, 2005). Thus, in the immediate period post-surgery, proper post-operative care is needed to enhance patient recovery and reduce morbidity or mortality (Brenan, 2007).

Post-operative management is the care a patient receives after surgery (Muir, 2007). It usually begins immediately after surgery, lasts for the entire duration of a hospital stay and may continue after a patient has been discharged from the hospital (Evans *et al.,* 1994). In the immediate period, the technician/nurse is required to ensure that the patient is nursed in a recovery room and continuously monitored (Defede, 2017). Nursing care entails close monitoring of the patient's vital parameters, thermoregulation, fluid therapy, ventilatory support, wound dressing, administration of antimicrobials, physical therapy, nutritional support and postoperative analgesia (Busch, 2006). Also, during the recuperative period, the client is carefully mentored and instructed on the use of drugs dispensed (Richard *et al.,* 2011).

Proper post-operative care enhances the survival rate of patients who underwent surgical treatment. However, in clinical veterinary practice within our locality, there are no established guidelines for post-operative care of patients. Thus, the prescription of drugs and strategy for post-operative care may be dependent on the availability of drugs as well as the clinician's experience and judgement. These practices may adversely affect patient's survival. Hence, this study aims to investigate the post-operative protocols used in canines, porcines and small ruminants surgically handled in the University of Nigeria Veterinary Teaching Hospital (January 2010 - December 2019). The study aims to assess the criteria guiding the choice of post-operative protocols in UNVTH.

Methodology

This research was carried out by studying case files of patients presented and treated at the University of Nigeria Veterinary Teaching Hospital (UNVTH) between January 2010 and December 2019. During this period, a total of 2526 animals comprising canine, porcine, ovine, and caprine were treated. Of this number, a total of 63 case files were studied because they were surgical cases and 2463 were not studied (non-surgical cases).

Information extracted from the files of surgical cases were;

i. The patient's file numbers.
ii. The patient species (canine, caprine, ovine and porcine)
iii. Sex of each patient.
iv. The anaesthetic combinations used.
v. The years each patient was treated.
vi. Post-operative antibiotic
vii. Type of and analgesic used.
viii. Fluids used intra and post-operatively
ix. Types of surgery performed

Data Analysis

The proportion of each species which underwent surgery was calculated. The proportion of male and female patients that underwent surgery was calculated. The percentage distribution of canines, ovines, caprines and porcine operated on were calculated. Percentages of male-to-female patients of each species were also determined. The types of surgery performed in different species were noted and presented as percentages. The total number of cases which received a particular anaesthetic combination, post-operative analgesic, antibiotic and fluid were summarized and presented as a percentage of the total number of surgical cases studied.

Result

Case proportion

A total number of 2526 cases were presented in the University of Nigeria Veterinary Teaching Hospital (UVTH) from 2010-2019. Out of these cases, 65 were surgical cases and the percentage of these surgical cases was 2.57% (Figure 1)

Sex distribution of surgical cases

Out of 2.57% of surgical cases, 1.65% were canine (0.67% male and 0.98% female) while 0.63% were caprine (0.16% male and 0.48% female). Ovines and porcine operated on were all females in 0.24% and 0.04% respectively.

Types of surgical procedures

The most frequently performed was a caesarean operation (0.63%) followed by wound apposition and debridement (0.51%), castration (0.39%), skin tumour excision (0.23%), uterine prolapse repair (0.12%). The least performed surgical procedures were laparotomy (0.04%), mammary growth excision (0.04%), transmissible venereal tumour excision (0.04%), atresia ani repair (0.04%) and ovariohysterectomy (0.04%).

Anaesthetic protocols

The most used anaesthetic protocol was lignocaine infiltration which was used in 0.08% canine patients and 0.86% caprine. In canines, Atropine/xylazine/ ketamine drug combination was used in 0.51% of cases followed by xylazine/lignocaine (0.16%). Atropine/pentobarbitone (0.08%), pentobarbitione (0.08%),

Lignocaine/pentobarbitone (0.04%) and chlorpromazine/ketamine (0.04%) were the least used in canines and caprines. Chlorpromazine/lignocaine (0.04%) was used only in porcine.

Post-operative antibiotics

The most used antibiotic was penicillin/streptomycin (1.07%), followed by procaine-penicillin (0.40%), gentamycin (0.28%), oxytetracycline (0.24%), ceftriaxone (0.08%.) The least used antibiotics were streptomycin (0.04%), ciprofloxacin (0.04%) and penicillin/ streptomycin/gentamycin (0.04%).

Post-operative analgesics

The most frequently used analgesic was acetaminophen (0.67%), followed by piroxicam (0.19%), diclofenac (0.19%) and tramadol (0.04%).

Fluid therapy

The most frequently used fluid was dextrose saline (0.12%) and the least used were haemaceel® (0.04%) and lactated Ringers (0.04%).

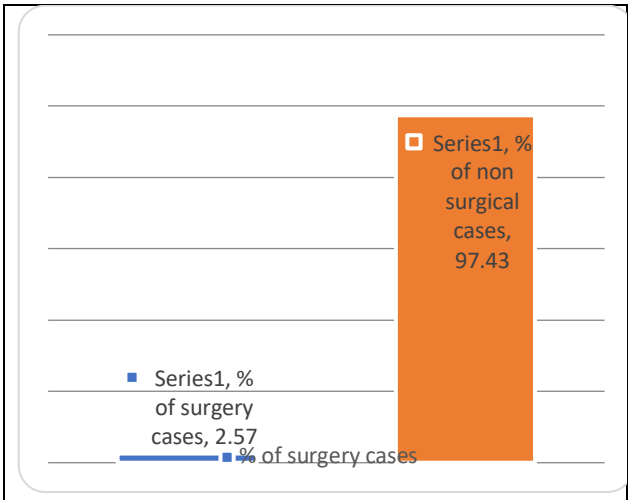

Figure 1: Total percentage of surgical and non-surgical cases during the 10-year reviewed period.

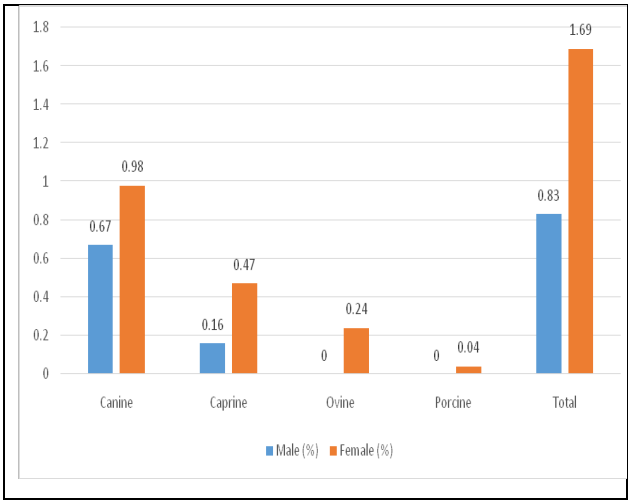

Figure 2: Percentage sex distribution of surgical cases studied within 10 years.

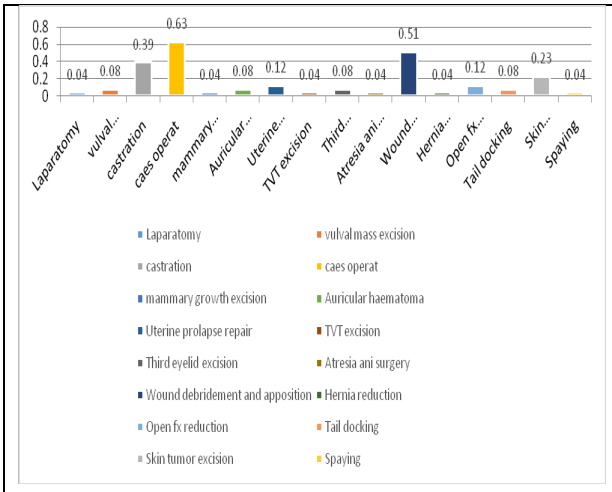

Figure 3: Percentage of surgical procedures performed during the 10-year study period

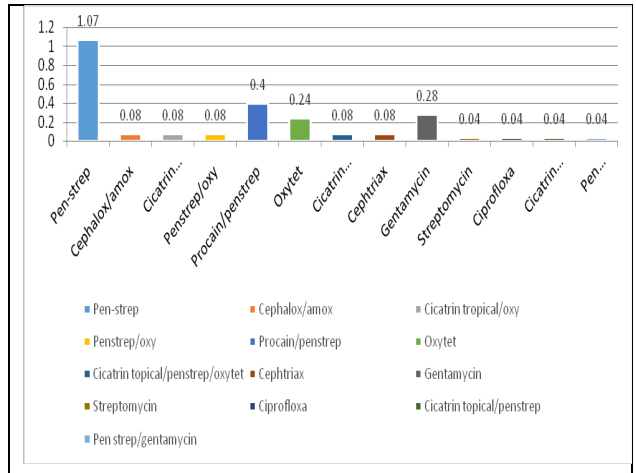

Figure 5: Percentage presentation of post-operative antibiotics used in different surgical cases over the 10-year reviewed period

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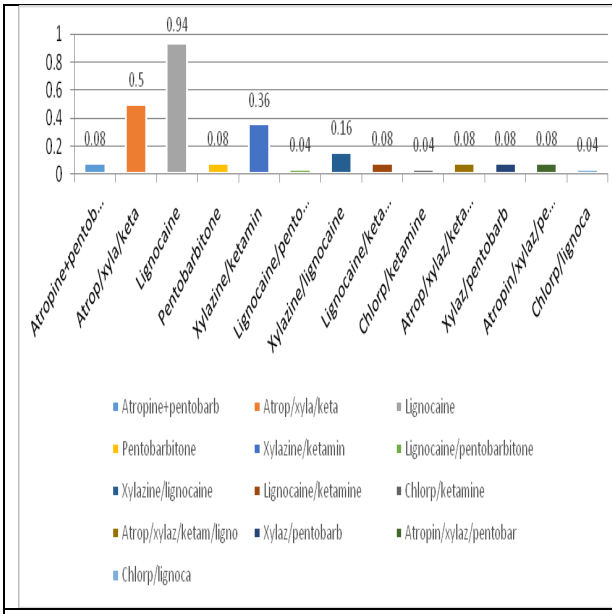

Figure 4: Percentage presentation of anaesthetic protocols used in different surgical procedures over the 10 years.

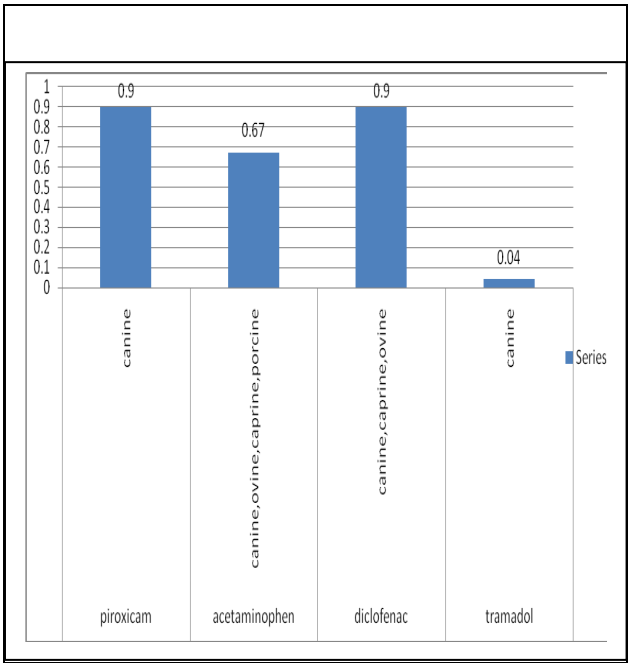

Figure 6: Post-operative analgesics used in surgery cases over the 10-year reviewed period.

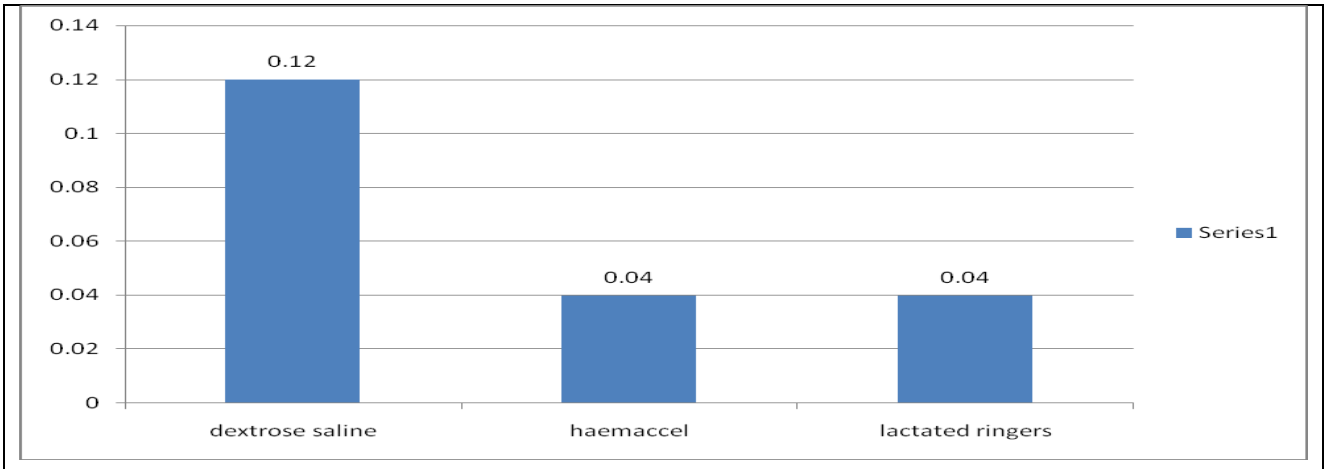

Figure 7: Fluids used in surgery cases over the 10-year reviewed study.

Discussion

Post-operative protocols are sequentially outlined procedures that must be followed for the successful and full recovery of medical and surgical patients. This study was a retrospective study that investigated post-operative protocols used in surgical patients in the Veterinary Teaching Hospital (VTH), University of Nigeria Nsukka (UNN). The outcome of the study revealed that out of 100% of case files studied, 2.57% formed a representative of the surgical cases handled. During the study period, medical patients were of higher percentage than surgical patients. Furthermore, canine patients presented were of greater percentage followed by caprine, ovine and porcine. This could suggest that ovine, caprine and porcine were kept majorly by low-income households for economic reasons, therefore they are not usually presented for treatment when ill (Udegbunam *et al*., 2016). Earlier Udegbunam *et al*. (2016) purported that these species are rather sold or slaughtered for meat whereas canines are mostly kept for pets and are well cared for thus are presented to the clinic for immediate care when sick.

The result of female animals being presented for surgical cases contradicts the report of Udry (1994) and Goy (1970). They argued that males engage in more behaviour that exposes them to the risk of injury and could as well die from the injury. Hence the finding of this study can be explained by the finding of the percentage of surgical procedures performed during the study period which showed that caesarean section was the most performed procedure. Caesarean section is the surgical intervention usually employed to preserve the dam and the neonate. It also ensures the integrity of the reproductive efficiency of the dam (Hiranya *et al*., 2015). It is usually indicated in conditions of dystocia (Hiranya *et al*., 2015).

The outcome of this study showed that different anaesthetic protocols were used to perform surgery during the study period. Previously, Richard *et al.* (2011) reported that the choice of anaesthetic protocol is dependent on the procedure namely surgical procedures, radiography, cast applications or diagnostic procedures. Other factors which influence the choice of the anaesthetic protocol include surgeon's preference, animal species, the variable reaction of different species to anaesthetic and factors that cause increased susceptibility to toxic action of anaesthetics (Richard *et al.,* 2011). The most used anaesthetic protocol was lignocaine infiltration which was used in 0.08% canine patients and 0.86% caprines to perform castration. This study also revealed that injectable form of general anaesthesia achieved using atropine/xylazine/ketamine and xylazine/ketamine were mostly used in canine patients. The frequent use of both drug combinations as well as no documentation of post-operative anaesthetic complications (in the case files) suggests that the anaesthetic components of the drug combinations are safe for use in canines.

Acetaminophen a non-steroidal anti-inflammatory drug was mostly used for both minor and major soft tissue procedures as well as orthopaedic cases. The rationale for the prescription of the drug is questionable since acetaminophen is indicated for the relief of mild to moderate pain and during pyrexia (Eric and Miaozong, 2011).

Surgical manipulation involves the opening up of a patient's body under proper asepsis. However, during this intervention, it is believed that the asepsis could be broken intra-operatively or there could be hospital-acquired infection (Busch, 2018). Antibiotics are common medications prescribed pre-intra and post-operatively to prevent wound infection which may arise following bacterial contamination of surgical wounds (Evans *et al*., 1994). However, the choice of different antibiotic types to be used is known to be dependent on the surgical team's decision, the cost of the drug to be administered, side effects (Ballow and Shentag, 1992), availability at the time of need as well as antibiotic spectrum of activities vis a viz duration and nature of the surgery (Courcol *et al.*, 1989). Procaine penicillin/streptomycin was the most used injected antibiotic while neomycin powder was topically applied to the wound. Procaine/penicilline is a penicillin-based antibiotic. Streptomycin and neomycin are aminoglycosides. Recent studies have shown high antimicrobial resistance to both classes of antibiotics (Busch, 2018). This may explain the reason constant change in the antibiotic

prescription for a particular case which was noted during the case file review.

Retrospective findings on the post-operative fluid administered to the surgical patients showed that out of 2.57% of surgical patients, only 0.02% of patients received fluids. Previously (Udegbunam *et al*., 2016) reported a similar finding where a lesser percentage of surgical patients were given fluids peri-operatively. The goal of fluid therapy is to replace, ongoing fluid loss and surgical support (Udegbunam *et al*., 2016). Post-operative fluid therapy plays a key role in providing adequate tissue perfusion, and hemodynamics and reducing morbidities and mortalities (Shires *et al*., 1967). However, it could mean that post-operatively, the low percentage of fluid therapy could amount to the diverse number of animal patients that need the fluid. The fluid administered was 0.16% crystalloids and 0.04% colloids. It could mean that they were used as drugs with specific indications (Davis *et al*., 2013) to maintain homeostasis or to achieve stable haemodynamics (Udegbunam *et al*., 2016).

In conclusion, the findings of this study showed that a very low percentage of cases were presented for surgical interventions while a greater percentage of females were operated on. The proportion of cases presented with specie variation ranked canine highest followed by caprine, ovine and then porcine the lowest. The choice of anaesthetic protocol, fluid administered, antibiotics administered and analgesic injected were based on the decision of the clinician in charge and the availability of drugs.

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