

STRATEGIES AND OUTCOMES IN THE MANAGEMENT OF ACUTE DIARRHOEA IN CANINE PATIENTS: A COMPREHENSIVE STUDY OF 118 CASES

STRATEGII ȘI REZULTATE ÎN MANAGEMENTUL DIAREEI ACUTE LA PACIENȚII CANINI: UN STUDIU CUPRINS PE 118 CAZURI

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ABSTRACT | REZUMAT

Diarrhoea is a clinical condition characterised by the frequent passage of loose, liquid, or watery stools, often exceeding the typical bowel movement consistency. It is a very common clinical sign, encountered ubiquitously in daily practice. Therefore, knowing the best way to manage this syndrome is essential for any veterinarian. This study was performed by analysing clinical and paraclinical data from 118 dogs that were registered at the veterinary hospital of the Faculty of Veterinary Medicine in Cluj-Napoca, the sole criteria of inclusion being the exhibition of acute diarrhoea among other clinical manifestations. Each case has been categorised according to the characteristics of each individual, the clinical signs, the duration of treatment, and the treatment itself. Then, each percentage characterising the cases has been compared to the percentages of the other cases to try to find possible predispositions or patterns that could explain the outcome of each case. As a result, we were able to draw several conclusions, such as the fact that diarrhoea is most often affecting puppies below one year of age, representing 49,14% of cases, and they are frequently associated with the detection of canine parvovirus, accounting for more than 30% of cases.

Keywords: diarrhoea, predispositions, diagnosis, treatment

Diareea este o afecțiune clinică caracterizată prin descărcări frecvente de scaune moi, lichide sau apoase, depășind adesea viteza tipică a pasajului intestinal și este un semn clinic întâlnit omniprezent în practica veterinară curentă. Prin urmare, cunoașterea celui mai bun mod de a gestiona acest sindrom este esențială pentru orice medic veterinar. Acest studiu a fost realizat prin analiza datelor clinice și paraclinice de la 118 câini care au fost înscriși în registrele Spitalului Veterinar din cadrul Facultății de Medicină Veterinară din Cluj-Napoca, singurul criteriu de includere fiind prezentarea diareei printre alte manifestări clinice. Fiecare caz a fost clasificat în funcție de caracteristicile fiecărui individ, de semnele clinice și tipul și durata tratamentului. Apoi, fiecare procent care caracterizează cazurile a fost comparat cu procentele celorlalte cazuri pentru a încerca să găsească posibilele predispoziții sau modele care ar putea explica rezultatul fiecărui caz. Drept urmare, am reușit să tragem mai multe concluzii, precum faptul că diareea afectează cel mai adesea cățelii sub un an, reprezentând 49,14% din cazuri și sunt asociate frecvent cu depistarea parvovirusului canin, având importanță în mai mult de 30% din cazuri.

Cuvinte cheie: diaree, predispoziții, diagnostic, tratament

Diarrhoea is a symptom of disrupted gastrointestinal function, attributed to an accelerated transit of faecal matter through the intestines, impeding the absorption of water and electrolytes (35). Diarrhoea may result from a variety of underlying causes, encompassing infections, inflammatory conditions, dietary indiscretions, and functional gastrointestinal disorders (29, 30, 34). Its clinical significance lies in the potential for dehydration, electrolyte imbalances, and nutritional deficiencies, necessitating thorough diagnostic investigation and tailored therapeutic interventions for effective management (5, 20). The condition called

acute diarrhoea refers to cases when the clinical signs last for a maximum of 14 days (3, 20). In dogs, this is a very common reason for the consultation of a veterinarian. Many times, it resolves even without treatment (7, 10, 31). In a study published in 2021, the median duration of clinical signs was two days (9). The aetiologies are very numerous, including infectious, diet, inflammatory, stress, drugs, toxins, neoplasia, or even secondary to other organ issues (especially liver, kidneys, or pancreas) (20). This high number of aetiologies is making the accurate diagnosis complicated and the specific treatment uncommon (12, 13, 37). Moreover, there is a high prevalence of diarrhoea accompanied by other clinical signs, such as vomiting and blood in the faeces, which can be explained by the fact that those other clinical signs in-

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crease concern about the pet's status, meaning that when there is only diarrhoea as a clinical sign, the majority of owners will not seek veterinary consultation (16, 31). Usually, the first-choice treatment is based on symptom relief because it is often enough to treat the clinical signs (14, 15, 18) and easier to achieve than to look for the exact aetiology. However, this leads to the overuse of anti-microbials, without evidence of infection or antibiogram realization. A study showed that 49.7% of dogs with acute diarrhoea are prescribed with systemic antimicrobial drugs, and even up to 58.5% in moderate cases, at the initial presentation of the animal (31). The question of antimicrobial-resistant bacteria selection and spreading is, thus, an important issue in the current treatment of diarrhoea in dogs (19, 21, 25).

MATERIALS AND METHODS

This study was conducted on 118 dogs presenting with acute diarrhoea as one of the clinical signs. Those dogs were treated at the Faculty of Veterinary Medicine of Cluj-Napoca between 2019 and 2022. These cases were chosen in chronological order from the clinical files available, with the only criteria being the presence of acute diarrhoea among the clinical signs presenting at admission, regardless of the presence of any other clinical signs.

The cases were analysed firstly according to the patient information, the clinical presentation, the diagnostic tools used, and the treatment administered. Afterward, a classification of the cases was made based upon the number of hospitalisation days, resulting in 4 categories: 1 day, 2 days, 3 days, and more than 3 days. From those categories, another two were studied according to the response to the initial treatment, in order to distinguish between patients who have achieved complete resolution of symptoms and patients that had to come back to the hospital for the same issue. Those categories were named according to the number of days needed to be dismissed from the hospital after the first visit (1 day or more than 1 day) and the number 0 next to it, expressing that the first treatment attempt did lead to clinical improvement. All of this results in seven categories: 1 day, 1 day – 0, 2 days, 3 days, more than 3 days, more than 1 day – 0, and the final category regrouping all of the previous ones. Within those seven categories, the cases have then been categorised according to the symptoms present at the first admission, resulting in eight subcategories: diarrhoea alone; diarrhoea and systemic signs; diarrhoea and vomiting; diarrhoea, vomiting, and systemic signs; bloody diarrhoea; bloody diarrhoea with systemic signs; bloody diarrhoea and vomiting; bloody diarrhoea, vomiting and systemic clinical signs.

RESULTS AND DISCUSSIONS

From the 118 analysed cases, 57.63 % are males and 42.37 % are females. This could indicate that males are more prone to developing diarrhoea than females. Similar data was found in a study about pathogens and lifestyle risk factors in dogs showing diarrhoea published in 2011 (33). Regarding age, investigated patients fell between 1.5 months and 14 years old, with almost half of them being under one year old (49.14 %), and the second category best represented being between 2.5 and 5 years old (16.38 %) (Fig. 1.). Consequently, an observation arises that the incidence of diarrhoea may manifest with greater frequency in younger dogs compared to adult and senior ones. Moreover, a study performed in 2010 (36) confirms our observation, showing that puppies up to 6 months old are more often affected by diarrhoea.

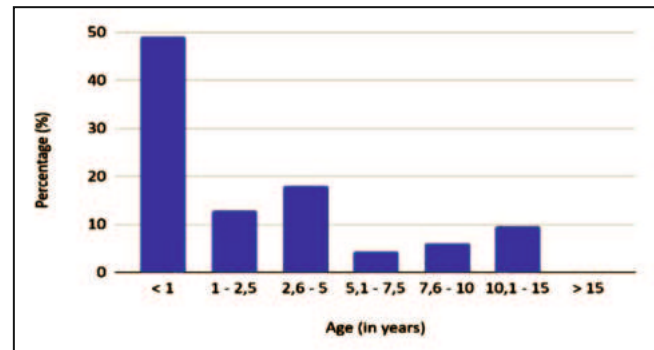


Fig. 1. Distribution of the dogs according to their age

The weight of the dogs was classified into categories with intervals of 5 kg, with the majority (42%) being below 5 kg and the second most represented being the 5-10 kg category (Fig. 2). This could suggest that small dogs are much more likely to develop diarrhoea compared to large-breed dogs, which is the same assumption that was made in another study (17). Out of all 118 analysed cases, more than 95 % of diarrhoea was combined with other clinical signs. For example, in 72.88 % of cases, vomiting is also present, and in 54.24 % of cases, there are also systemic signs accompanying the diarrhoea. This could be explained by the increased concern of owners when there are multiple symptoms, pushing them to seek veterinary care, or it could mean that diarrhoea is often associated with other symptoms. Knowing that, diarrhoea resolves by itself most of the times (22, 27, 31), we can assume that the most probable in our case is the first hypothesis, with the multiple symptoms worrying dog owners. Complementary exams were performed in more than 80% of the cases, with the majority being the snap test to detect canine parvovirus antigen in dog faeces with 38.98%.

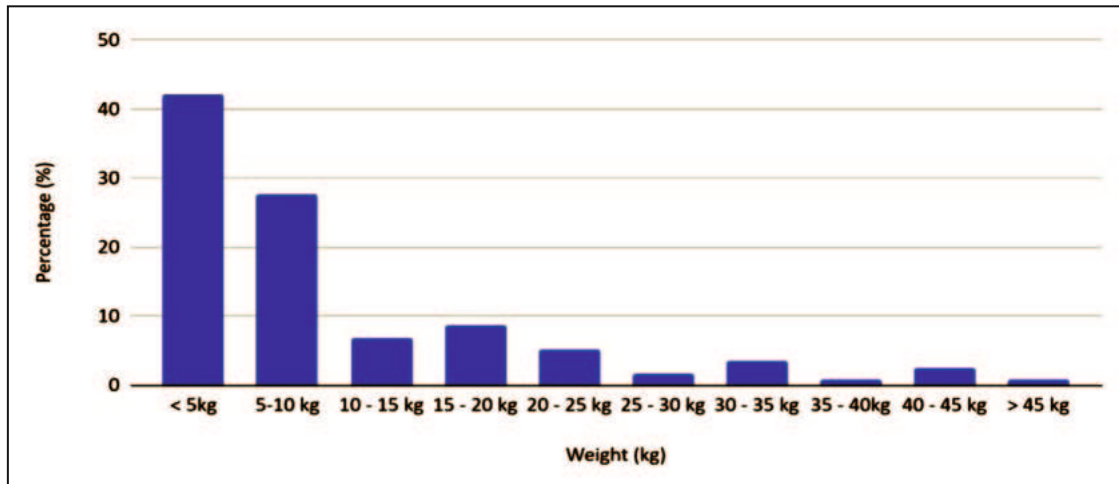


Fig. 2. Distribution of the population according to the weight

It is easily explained by the high percentage of young dogs in this study, and in general, parvovirus infections are much more often identified in this age group (23, 24). Indeed, of those tested, 39.58% were positive for parvovirus, and even up to 71 % of positive snap tests were found between 3- and 5.5-months-old puppies (Fig. 3). According to a study published in 1998, puppies have antibodies against parvovirus transferred by the colostrum from their mother at birth; moreover, the level of antibodies is decreasing gradually until it reaches an index below 1 log 10 of titre around 90 days after birth (4). Therefore, we can correlate it with our results showing a greater proportion of affected puppies after 3 months old.

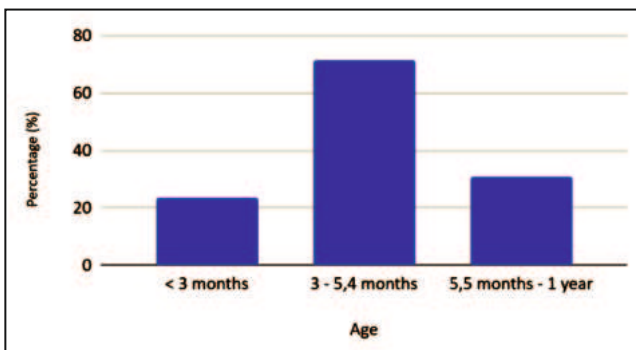


Fig. 3. Proportion of tested dogs that are positive for Canine Parvovirus

In more than a quarter of the cases, an ultrasonography has been performed, and in 22.88% of the cases, a complete blood count has been obtained. To a lesser extent, other exams were performed, such as serum biochemistry, blood gas analysis, and coprology. In less than 5 % of cases, radiography and snap tests to detect canine distemper virus, canine coronavirus, or giardia were used.

Regarding treatment, all evaluated cases received

at least one pharmacologically active substance. More than 80% of the dogs experienced complete resolution of clinical signs after a single symptomatic treatment administration. Regarding the hydration status, 54.78 % of cases showed signs of dehydration and needed an intravenous substitution with either Ringer or saline solutions. Indeed, diarrhoea induces the loss of fluids and can lead to electrolytes imbalances, and in some cases, the best route to replace those fluids could have been enteral administration for an easier and cheaper treatment (26, 28, 32), but as vomiting was a clinical sign described in more than 80% of our cases, the intravenous route was preferred in these patients. In the majority of cases, corresponding to 19%, a combination of 3 drugs was used, and the rest of them were treated with between 1 and 9 drugs. The categories of drugs used were anti-emetics, gastric protectants, antibiotics, antispastics, anti-haemorrhagic, and pain-killers. From those categories, the drugs most commonly used, in more than 50% of cases, were maropitant and pantoprazole.

For both males and females, the outcome distribution is almost similar, with around 70% of cases resolved after one day of treatment. According to treatment duration, the age categories that seemed to have the quickest recovery were below 1 year old and between 5.1 and 7.5 years old, with more than 77% of them needing only one day of treatment (Fig. 4). Another category with a great success rate is the one with dogs above 10 years old, with 72.73% of them treated in one day. For the other categories, the percentage of dogs treated in one day is between 57% and 62%, which is still a good percentage.

Out of all dogs that showed only signs of acute diarrhoea at admission, most of them received treatment and were sent home the same day, but 20% of cases came back for the same issue one day later. In cases that presented both diarrhoea and vomiting,

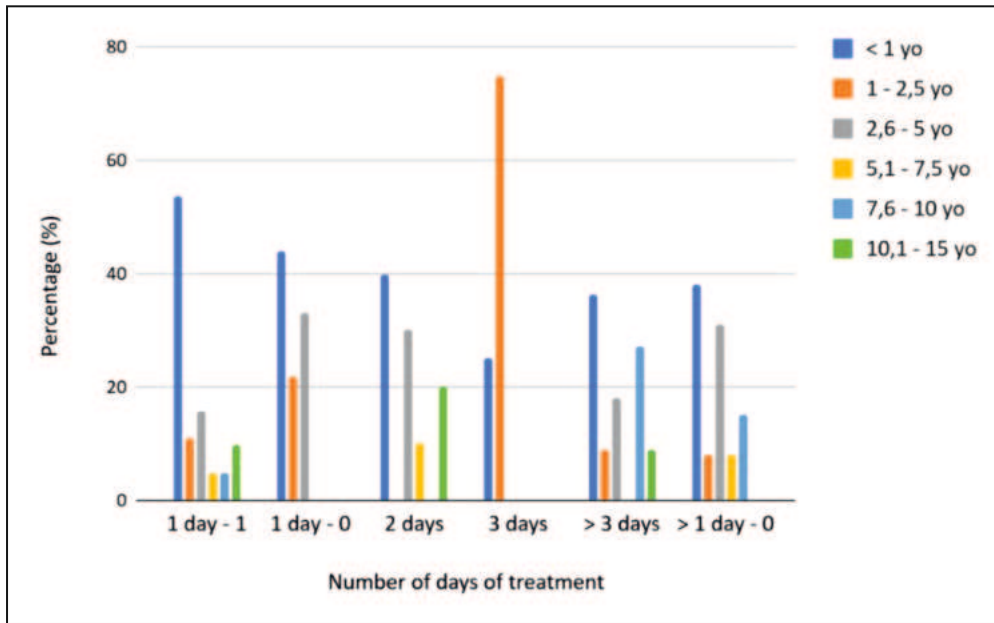


Fig. 4. Distribution of the cases according to their age and duration of treatment

78.57% resolved in one day with the treatment (Fig. 4.). For the others, they needed 2 to 3 days. Moreover, when diarrhoea and vomiting were associated with systemic signs, the percentage of cases that resolved in one day decreased to 54.55%. In the same way, diarrhoea and vomiting, when associated with blood in the faeces, decrease the resolution in one day to 66.67%. This could indicate that vomiting is a clinical sign that has a negative influence on the duration of the disease. Whereas, when diarrhoea and vomiting are associated with blood in the faeces and systemic signs, the percentage of cases that resolve in one day

stays at 70%, meaning that the presence of systemic signs does not greatly influence the duration of disease, contrary to vomiting.

There are 64 cases, meaning 54.24% of the total cases presented systemic signs in addition to diarrhoea, regardless of other clinical signs. From those, 13 cases had only diarrhoea and systemic signs; 85.71% of them resolved in one day without complications (Fig. 5); half of the rest had to come back for the same gastro-intestinal issue, but only for one day. It could show that systemic signs are not necessarily indicating a longer period for recovery. However, in ca-

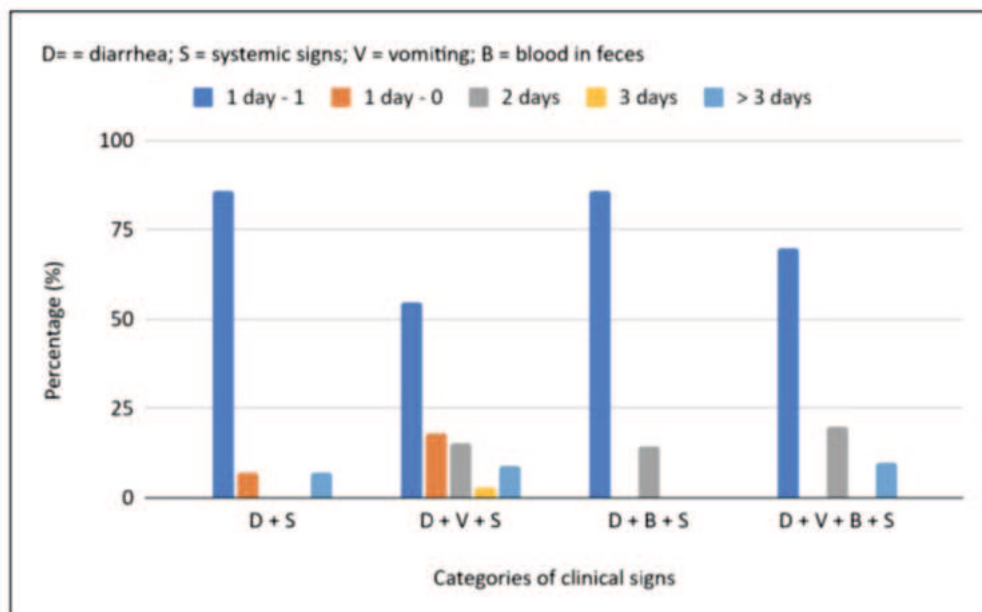


Fig. 5. Distribution of the cases according to their age and duration of treatment

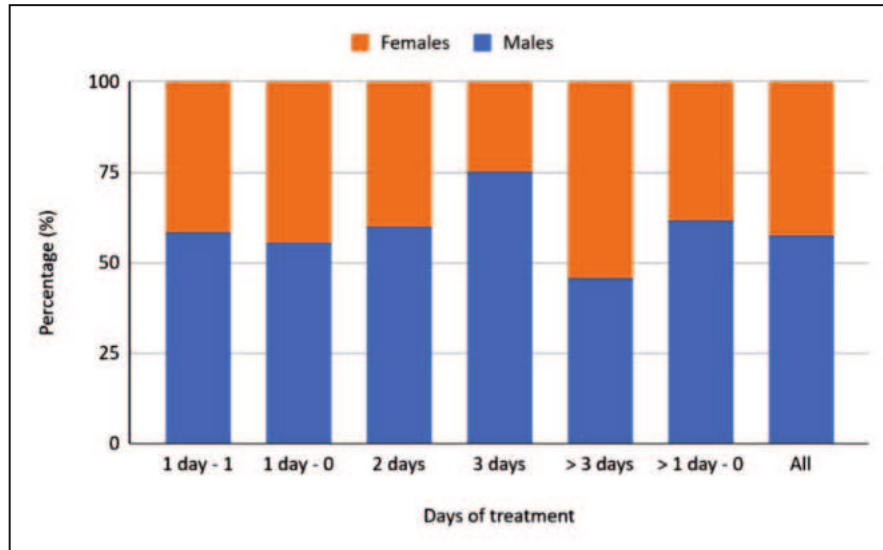


Fig. 6. Ratio between males and females according to the duration of treatment

ses where diarrhoea and systemic signs are concomitant to vomiting, it goes down to 54.55% of the success rate of treatment in one day. This could be a sign that systemic signs can contribute to prolonging the time of recovery; however, as previously mentioned, it is most likely linked to the vomiting issue because when the dogs are vomiting, it seems to always decrease the percentage of dogs treated in one day, which is not the case with systemic signs. Indeed, when diarrhoea and systemic signs are associated with blood in the faeces, the percentage of dogs needing only one day of treatment is 85.71%, meaning that the systemic signs are not associated with a prolonged period of treatment.

There are 84 dogs that recovered with only one day of treatment, meaning 71.19%. The other cases are distributed more or less evenly throughout the other categories, with a smaller percentage of 3.39% of cases treated in 3 days. The ratio between males and females is the same with the general population, independently of the number of days of treatment; except when it lasted 3 days and more than 3 days (Fig. 6). However, the category of 3 days treatment contains only 4 cases, which means it is not reliable. On the contrary, the category of more than 3 days of treatment contains 11 cases, meaning that it can be considered even if it is not the best for accuracy. Therefore, we might wonder if females have a bigger tendency to

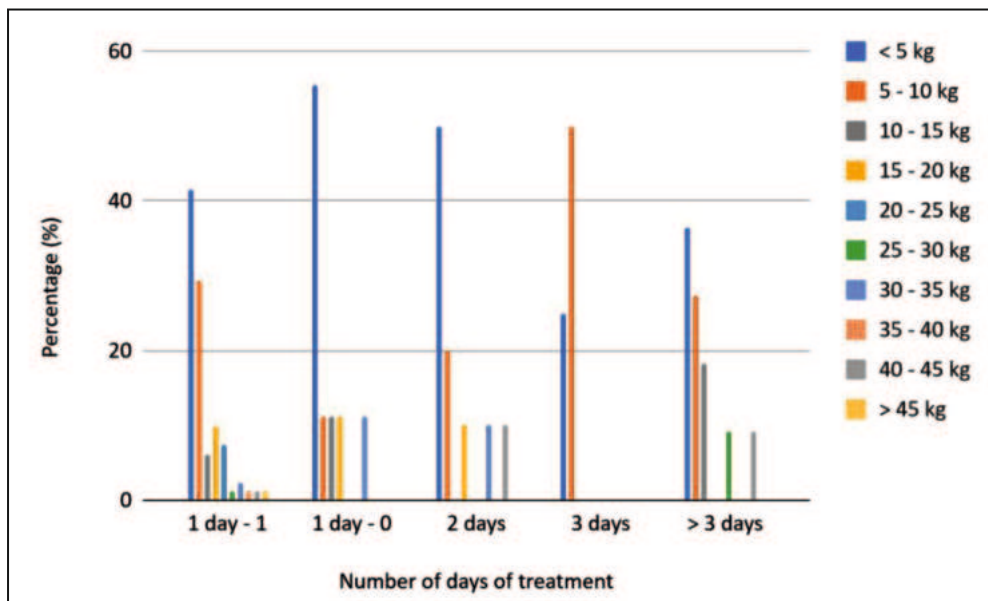


Fig. 7. Distribution of the cases according to their weight and duration of treatment

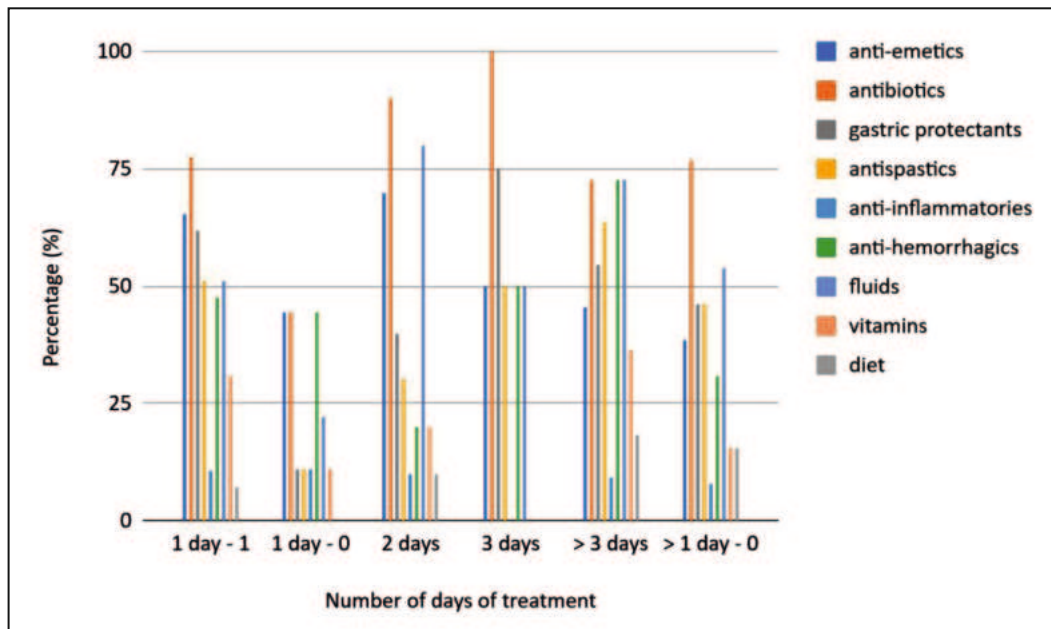


Fig. 8. Treatment plan according to the hospitalisation period

need more time to recover from diarrhoea, compared to males. The distribution of dogs according to their weight, depending on the number of days of treatment needed, seems the same as the general population, meaning that the most represented category is always the dogs below 5 kg (Fig. 7.). There is one exception: for the dogs treated for 3 days, the majority are between 5 and 10 kg, with 75%, but once again, the 3 days category has only 4 cases, therefore this is not really reliable. However, once the treatment lasts more than 3 days, there is a tendency to have heavier dogs, especially those of 10 – 15 kg, but also those above 25 kg. The same tendency is observed in cases where the treatment did not work the first time, with dogs above 25 kg representing more than 30 %, whereas they represent only 10 % of the general population. This can be interpreted as heavier dogs being harder to treat and needing more time before recovery from diarrhoea (8, 11).

The only obvious thing when comparing the percentages of drugs used according to the duration of treatment needed (Fig. 8) is that drugs were less used when the treatment lasted one day but failed. Knowing that 67% of cases that lasted one day and failed had diarrhoea with vomiting and systemic signs, it seems that the treatment was not adapted to the clinical signs. The administration of anti-emetic drugs, such as maropitant and metoclopramide, is higher in cases where the treatment was needed for only 1 to 2 days, with more than 65% (Fig. 8), and they were less used in the categories with a treatment lasting more than 3 days and when the treatment failed. Moreover, in the cases for which the treatment lasted one day but failed with dogs that presented diarrhoea with vomiting and

systemic signs, the treatment can be compared to cases with similar signs, but which did not fail. For instance, the use of anti-emetic drugs is only 50% in cases of failure, compared to more than 80% when the treatment is needed only for 1 or 2 days. Also, in cases where vomiting was not actually present as a clinical sign, it was still administered 16.67% to 50% of cases, which required only one day of treatment. It shows the importance of using anti-emetics, even if vomiting is not present. An important aspect of the treatment of acute diarrhoea is rehydration through intravenous fluids such as Ringer's or saline solutions (1, 2, 6). Indeed, when the treatment worked properly, no matter the duration of treatment, fluids were used in more than 50% of cases, and diphalyte was added in more than 20% of cases, compared respectively to 22.22% and 11.11% of cases where treatment failed in one day of treatment. It shows that fluids are useful in treating diarrhoea; however, it does not seem to impact the duration of it.

CONCLUSIONS

From the analysis of the 118 cases of dogs presenting diarrhoea, we can state that small dogs, especially those under 5kg of body weight, are more susceptible to developing diarrhoea. Similarly, males seem to be more often affected than females, even if the difference between the two sexes is not very high. Also, dogs below one year of age, and especially between 3 and 5.5 months old, when the antibodies from the colostrum of the mother are no longer present in sufficient amounts in the blood of the puppies. Therefore, the hygiene must be very well controlled, and

contact with other animals must be restricted at such ages to avoid contamination.

The degree of severity can be estimated according to the presence of other clinical signs, especially vomiting, which seems to increase the time of treatment needed. It can help to prevent complications, by explaining to owners that when diarrhoea is accompanied by vomiting, the risks are higher, thus the best course of action is to seek veterinary care as soon as possible. Complementary exams are not essential for the treatment of diarrhoea in dogs; however, they are useful to guide the diagnosis, especially in younger dogs with the detection of canine parvovirus.

About the treatment, the use of anti-emetic drugs should always be part of it, especially if vomiting is one of the clinical signs, as it seems to reduce the duration of treatment needed. Similarly, the use of metronidazole is very important, but the dose should be well adapted, with higher doses being more efficient. In every case, the treatment has to be adapted to the patient and its clinical signs. Indeed, the use of anti-haemorrhagic drugs is relevant when blood is present in the faeces, but it does not seem to have an effect when bloody diarrhoea is not part of the clinical signs.

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