Detection of feline idiopathic cystitis as the cause of feline lower urinary tract disease in Sleman Regency, Indonesia

Andi Tri Julyana Eka Astuty1, Ida Tjahajati2 and Widagdo Sri Nugroho3

1. Graduate Program of Sain Veteriner, Faculty of Veterinary Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia; 2. Department of Internal Medicine, Faculty of Veterinary Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia; 3. Department of Veterinary Public Health, Faculty of Veterinary Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia.

Corresponding author: Ida Tjahajati, e-mail: ida_tjahajati@yahoo.com
Co-authors: ATJE: anditriulyanjanae@gmail.com, WSN: weesnugroho@ugm.ac.id
Received: 17-12-2019, Accepted: 22-04-2020, Published online: 16-06-2020
doi: www.doi.org/10.14202/vetworld.2020.1108-1112
How to cite this article: Astuty ATJE, Tjahajati I, Nugroho WS (2020) Detection of feline idiopathic cystitis as the cause of feline lower urinary tract disease in Sleman Regency, Indonesia, Veterinary World, 13(6): 1108-1112.

Abstract

Background and Aim: Feline lower urinary tract disease (FLUTD) is one of the common cat diseases. The aim of this study was to detect feline idiopathic cystitis (FIC) as a cause of FLUTD in Sleman Regency, which is a problem in the population.

Materials and Methods: Seventy-three cats with FLUTD symptoms were used from seven veterinary practices in Sleman Regency. The logging of each cat’s medical history, clinical examination, urinalysis, routine blood screening, and ultrasonography was conducted to diagnose the cause of FLUTD.

Results: The percentages of diseases causing FLUTD included FIC 21.9%, urolithiasis 57.5%, urinary tract infection (UTI) 16.4%, neoplasia 1.4%, trauma 1.4%, and nervous disorders 1.4%.

Conclusion: FIC, one of the causes of FLUTD, is found in cats and has become a problem among the cat population in Sleman Regency, Yogyakarta, Indonesia. Various handling and preventive efforts should be undertaken against the disease.

Keywords: cat, detection, feline idiopathic cystitis, feline lower urinary tract disease, Indonesia, Sleman.

Introduction

Feline lower urinary tract disease (FLUTD) is one of the health disorders commonly found in veterinary practice. In general, the definition of FLUTD is a syndrome of various types of disorders occurring in the bladder and/or urethra of cats [1,2]. The clinical symptoms that can be found in the case of FLUTD include hematuria, pollakiuria, stranguria, periuria, dysuria, and either accompanied or not accompanied by an obstruction of the urethra [3,4]. Urolithiasis, urethral plugs, infections, neoplasia, anatomical defects, and iatrogenic reasons are some of the causes of FLUTD. However, if after an investigation does not find the cause of FLUTD, the feline patient is said to experience feline idiopathic cystitis (FIC) [2,5,6]. The diagnosis of FIC is made after eliminating other possible diagnoses in FLUTD [2,7].

In population studies conducted in Switzerland, 57% of FLUTD were caused by FIC, 22% by urolithiasis, 10% by a urethral plug, and 8% by urinary tract infection (UTI) [8]. Of the eight studies that have been done, the reported incidence of various causes of FLUTD, FIC is the main cause of FLUTD with a proportion between 27% and 72%; urethral plug occurs between 10% and 22%, UTI between 1% and 19%, and uroliths between 7% and 23% [6].

Information about FLUTD caused by FIC in Indonesia, especially in Yogyakarta, is still very limited. Veterinarians report encountering common symptoms of FLUTD, but a population-based depth review of this case has never been done. This investigation is the underlying research to examine FLUTD and FIC, further using the detect disease approach method in the population of cats in the Sleman Regency of Yogyakarta, Indonesia.

Materials and Methods

Ethical approval

All experimental protocols and animal work were approved by the Ethical Clearance Committee of the Veterinary Faculty, Gadjah Mada University, Indonesia (clearance number 0025/EC-FKH/Int./2019), and conducted in strict adherence to the principles of animal care.

Study period and locations

The research was conducted from March to May 2019 in the following seven places in Sleman Regency: Animalova Small Animal Clinic, Klinik Hewan Jogja, Godean Pet Clinic, Satwa Kita Clinic and Pet Shop, Dji’o Pets Care, Kuningan Animal Clinic Faculty of Veterinary Medicine Universitas Gadjah Mada, and the Veterinary Hospital of Prof. Soeparwi.

Procedures

This study used 73 cats (estimation of cats population data in Sleman Regency is 20,067 tails [9])
with symptoms of FLUTD (hematuria, pollakiuria, stranguria, perianuria, dysuria, and both accompanied and not accompanied by obstruction of the urethra). The collection of medical history data, clinical examination, urinalysis, ultrasonography, and routine blood analysis was done to determine the cause of FLUTD.

The enforcement of urolithiasis and neoplasia diagnosis was performed if the ultrasound test results were known to be a stone/urolith or tumor mass [3,10]. The UTI diagnosis was made if the urinalysis observed concentrated urine with pyuria. Confirmation of the diagnosis of FLUTD disorders caused by trauma and paralysis was conducted based on the clinical examination of samples and the owner’s anamnesis. Verification of FIC was performed if the sample was not included in the group with urolithiasis, UTI, neoplasia, trauma, and paralysis [3,11].

**Statistical analysis**

The data collected were analyzed descriptively using Microsoft Excel and SPSS 16.0 programs (IBM Corp., NY, USA).

**Results**

**Sample variables**

Domestic cats were 35.6%, Persian and Persian mixes were 27.4% and 31.5%, respectively. Male cats were found more than females. The average sample was 2.83±2.02 years old, with an average weight of 3.8±0.95 kg. When the entire sample was grouped by body condition score (BCS), cats with normal BCS and fat were greater than cats with lean BCS (Table-1).

In this research, most cat owners complained of dysuria, hematuria, pollakiuria, and stranguria. Besides, 17.8% of samples came to the veterinary practice with non-specific general complaints, leading to urinary disorders (Table-2).

**Table-1**: Description of cat samples in animal clinics in Sleman Regency.

| Variable demographics | Frequency (tails) | Percentage (%) |
|-----------------------|------------------|----------------|
| Breed                 |                  |                |
| Domestic              | 26               | 35.6           |
| Persian               | 20               | 27.4           |
| Persian mix           | 23               | 31.5           |
| Siamese mix           | 3                | 4.1            |
| Angora mix            | 1                | 1.4            |
| Gender                |                  |                |
| Males                 | 51               | 69.9           |
| Females               | 22               | 30.1           |
| Age                   |                  |                |
| <1 year               | 5                | 6.8            |
| 1-6 years             | 62               | 84.9           |
| 6-10 years            | 4                | 5.5            |
| >10 years             | 2                | 2.7            |
| BCS                   |                  |                |
| Lean (1-4)            | 3                | 4.1            |
| Normal (5)            | 38               | 52.1           |
| Obesity (6-9)         | 32               | 43.8           |

BCS=Body condition score

**The proportion of causes of FLUTD**

Various causes of FLUTD were diagnosed in the 73 cats used, such as FIC found in 16 cases (21.9%), urolithiasis found in 42 cases (57.5%), UTI found in 12 cases (16.4%), neoplasia found in 1 case (1.4%), trauma found in 1 case (1.4%), and nerve disorders/paralysis found in 1 case (1.4%) (Figure-1). From these findings, it is known that FIC is found in the population of cats in Sleman district and is a problem in this population.

**Discussion**

**Sample variables**

Table-1 shows that domestic and Persian cats are the most common breeds of cats found in FLUTD research in Sleman district. The same was found in the previous studies, domestic and Persian cat breeds are more common as FLUTD cases than other breeds of cats [10,12]. Male cats comprised 69.9% of FLUTD cases, whereas female cats comprised 30.1%. In research on FLUTD conducted in Germany, the number of FLUTD cases in male cats was also more when compared with the incidence in female cats; this gender difference is significant in the case of FLUTD [3]. The anatomical difference between the urinary tract of male and female cats is one of the predisposing factors of males and might explain why males are more widely encountered when compared with females [10].

The overall age range of the sample is highly correlated between 0.5 and 10 years old, with an average sample age of 2.83 years. The average age of cats in the case of UTI is older when compared with other types of disease groups (Table-3). Similarly, earlier research mentioned that UTI is commonly encountered in older cats. The cat with UTI has a significantly older age when compared with a cat with FIC [3,7].

The sample weight is in the range of 1-6.5 kg, with an average weight of 3.8±0.95 kg. The BCS assessment was conducted using a scale from 1 to 9. Sample grouping was done based on the BCS values of each sample. Samples are said to be lean/skinny if the BCS value is 1-4, normal body if the BCS is 5, and obese if the BCS is 6-9 [13]. After cats were grouped based on their BCS scores, there were more cats with normal and obese bodies and fewer cats with lean bodies. The average body temperature of the six groups of
Urinary disorders in medical history, such as not eating and drinking, weakness, vomiting, constipation, pain during urination (stranguria) was a complaint in 14 cats. Nineteen cat owners provided bloody urine (hematuria) from their cats. Pollakiuria was observed in eight of 16 samples with FIC (50%) and was the highest proportion of the entire group of existing diseases that exist. A total of 17.8% (13 cats) of samples came into the veterinary clinic with unspecified general complaints, leading to urinary disorders, such as not eating and drinking, weakness, vomiting, and constipation.

Urinary disorders in medical history, such as stranguria, hematuria, pollakiuria, and dysuria, were commonly reported complaints encountered in the case of FLUTD [10,12,15]. Dysuria is difficulty in urination or the inability to urinate. It is commonly encountered in the case of FLUTD and is always accompanied by enlargement of the bladder. In this study, most owners complained that their young cat had difficulty or could not urinate due to the blockage of urine flow (obstruction). From the overall symptoms of FLUTD, obstruction is one of the symptoms that tend to be easily observed and is rarely overlooked by the owner. Cats with obstruction will generally become less active, have decreased appetites and drink less, look limp, and sometimes have vomiting. Cats with obstruction were significantly depressed and needed a veterinarian immediately [10].

| Diagnosis and number of patients (tails) | FIC (16) | Urolithiasis (42) | UTI (12) | Trauma (1) | Neoplasia (1) | Nerve disorder (1) | Total |
|----------------------------------------|----------|-----------------|----------|------------|---------------|-------------------|-------|
| Anamnesis                               |          |                 |          |            |               |                   |       |
| Stranguria                              | 4        | 7               | 2        | -          | 1             | -                 | 14    |
| Hematuria                               | 6        | 10              | 2        | 1          | -             | -                 | 19    |
| Pollakiuria                             | 8        | 8               | 1        | -          | 1             | -                 | 18    |
| Recurring                               | 2        | 7               | 2        | -          | -             | -                 | 12    |
| Dysuria                                 | 3        | 15              | 3        | 1          | -             | -                 | 27    |
| Others                                  | 1        | 11              | -        | -          | -             | -                 | 13    |

FIC=Feline idiopathic cystitis, UTI=Urinary tract infection

| Sample Demographic | FIC | Urolithiasis | UTI | Trauma | Neoplasia | Nerve disorder |
|--------------------|-----|--------------|-----|--------|-----------|----------------|
| Age (year)         | 2.5±1.53 (0.5-6.0) | 2.76±1.63 (0.5-7.0) | 3.93±3.34 (0.75-10) | 0.5 | 1 | 2 |
| Temperature (°C)   | 38.21±0.81 (36.1-39.5) | 38.13±1.13 (33.6-39.7) | 37.38±1.94 (32.4-39.3) | 38.00 | 38.60 | 37.80 |
| Weight (kg)        | 4.41±0.94 (3.0-6.5) | 3.76±0.94 (1.0-6.0) | 3.912±0.92 (2.8-6.0) | 3.00 | 3.50 | 2.17 |
| Gender (tails)     | 11 males, 28 females, 5 females | 28 males, 14 females | 11 males, 1 female | 1 male, 1 female | 1 female |
| Total (tails)      | 16 | 42 | 12 | 1 | 1 | 1 |

FLUTD=Feline lower urinary tract disease, FIC=Feline idiopathic cystitis, UTI=Urinary tract infection
disease process in the population. Environmental factors include biological, physical, and social events of the individual [19]. In this study, the intended purpose not only regarded the individual cat samples but also involved the environment of cats, which includes environmental factors, social, economic, and cultural owners who can influence the events of FLUTD. Differences in the proportion of cases of FLUTD in the cat population in Sleman, compared with other regions, can be due to differences in maintenance patterns, food management, sampling methods, knowledge levels, and cat owner awareness. Maintenance patterns, feeding management, the environment around cats, and the management of cat stress can affect the incidence of FLUTD [3,15].

The selection of food types for cats as pets is influenced by the decision of the owner; many clients have strong emotional ties with cats as their pets, they want the best for their cat health and survival. Good quality commercial cat food with balanced nutrients, good for digestion, meets the daily nutrition needs of cats, and safe for cats are important for owners [20]. Different things were learned in this research. Most cat owners are founder of food with a low price that is easy to obtain, regardless of the nutrient content, minerals, food quality, the number of gifts, needs of cats, and food safety.

This research used seven clinics/veterinary hospitals in Sleman Regency as an epidemiological unit. This sample may result in the measurement bias, caused by variations in the ability of the doctor in conducting a FLUTD diagnosis. In addition, not all veterinarians at each clinic/veterinary practice/veterinary hospital have the same interest in the field of urology. This difference can result in the occurrence of underdiagnoses in some instances. Similarly, a hypothesis was mentioned from research involving some clinical data in North America. The researchers added that the case of FLUTD was more commonly found in clinics with a particular interest in urology compared with other clinics, where the possibility of a case of FLUTD was not diagnosed as FLUTD in a clinic that had no particular interest in the field of urology [12].

The level of knowledge and public awareness of their cat’s health could be one of the reasons for the low detection of FIC in Sleman district. Cats with pollakuria without obstruction are sometimes not observed by the owner or still considered normal because cats can still urinate. In some cases, cats still look active; therefore, for some owners, it is not yet considered a health issue that needs to be handled immediately by veterinarians. In FIC, the symptoms of FLUTD are seen to heal within 2-7 days by themselves, especially if not accompanied by an obstruction [5]. Unlike the urolithiasis cases observed in this research, the majority was followed by an obstruction (81%). When cats cannot urinate, abdominal pain arises, vomiting occurs, weakness follows, and depression results. This condition is evident and will be observed by the owner. It is deemed necessary to be handled by a veterinarian [10]. All these conditions can be reasons for the low number of FIC cases found in animal clinics in Sleman district. Besides, there are different characteristics of FLUTD itself in the cats population in Sleman district, compared with other research populations (America and Europe).

Conclusion

From this research, it can be concluded that FIC is one of the causes of FLUTD that is found in the population of cats in Sleman, Indonesia, at a proportion of 21.9%. FIC is a problem in the population, and various handling and preventive efforts should be undertaken against the disease.

Authors’ Contributions

IT, WSN, and ATJEA designed the study. ATJEA contributed to field survey and examined samples in the laboratory. All authors wrote, edited, read, and approved the final manuscript.

Acknowledgments

The authors are thankful to these seven veterinary practices in Sleman Regency for allowing us to collect the samples for this study. This study was financially supported by the RTA program of Universitas Gadjah Mada, Indonesia (Grant Number 3108/UN1/DITLIT/DIT-LIT/LT/2019).

Competing Interests

The authors declare that they have no competing interests.

Publisher’s Note

Veterinary World remains neutral with regard to jurisdictional claims in published institutional affiliation.

References

1. Black, V. (2018) Approach to feline lower urinary tract disease. *Companion Anim.*, 23(7): 388-394.
2. Kim, Y., Kim, H., Pfeiffer, D. and Brodbelt, D. (2017) Epidemiological study of feline idiopathic cystitis in Seoul, South Korea. *J. Feline Med. Surg.*, 20(10): 913-921.
3. Dorsch, R., Hartmann, K. and Sauter-Louis, C. (2014) Feline lower urinary tract disease in a German cat population: A retrospective analysis of demographic data. Causes an clinical signs. *Tierarztl. Prax. Ausg. K. Kleintiere Heimtiere*, 42(4): 251-239.
4. Lund, H.S., Kronveld, R.I., Halvorsen, I. and Eggertsdottir, A.V. (2013) Evaluation of urine analysis from untreated adult cat with lower urinary tract disease and healthy control cat: Predictive ability and clinical relevance. *J. Feline Med. Surg.*, 15(12): 1086-1097.
5. Osborne, C.A., Kruger, J.M. and Lulich, J.P. (1996) Feline lower urinary tract disorders: definition of term and concept. *Vet. Clin. North Am. Small Anim. Pract.*, 26(2): 169-179.
6. Forrest, S.D. and Towell, T.L. (2015) Feline idiopathic cystitis. *Vet. Clin. North Am. Small Anim. Pract.*, 45(5): 783-806.
7. Chew, D.J., Dibartola, S.P. and Schenck, P.A. (2011), Canine and Feline Nephrology and Urology. Elsevier
Saunders, USA. p306-340.

8. Gerber, B., Boretti, S., Kley, S., Laluha, P., Muller, C., Sieber, N., Unterer, S., Wengen, M., Fluckiger, M., Glaus T. and Reusch, C.E. (2005) Evaluation of clinical sign and causes of lower urinary tract disease in European cats. *J. Small Anim. Pract.*, 46(12): 571-577.

9. Dinas Pertanian, Pangan dan Perikanan Kabupaten Sleman. (2019) Data Populasi Ternak di Wilayah Kerja Seluruh Puskeswan Sleman Tahun 2018. Dinas Pertanian, Pangan dan Perikanan Kabupaten Sleman, Indonesia.

10. Saevik, B.K., Trangerud, C., Ottesen, N., Sorum, H. and Eggertsdottir, A.V. (2011) Causes of lower urinary tract disease in Norwegian cats. *J. Feline Med. Surg.*, 13(6): 410-417.

11. Buffington, C.A.T., Westropp, J.L., Chew, D.J. and Bolus, R. (2006) Clinical evaluation of multimodal environmental modification (MEMO) in the management of cats with idiopathic cystitis. *J. Feline Med. Surg.*, 8(4): 261-268.

12. Lekcharoensuk, C., Osborne, C.A. and Lulich, J.P. (2001a) Epidemiologic study of risk factors of lower urinary tract disease in cats. *J. Am. Vet. Med. Assoc.*, 218(9): 1429-1435.

13. Teng, K.T., McGreevey, P.D., Toribio, J.A.L., Raubenheimer, D., Kendall, K. and Dhand, N.K. (2018) Associations of body condition score with health condition related to overweight and obesity in cats. *J. Small Anim. Pract.*, 59(10): 603-615.

14. Neri, A.M., Machado, L., Okamoto, P.T., Fillippi, M.G., Takahira, R.K., Melchert, A. and Gomes, L.M. (2016) Routine screening examination in attendance if cats with obstructive lower urinary tract disease. *Top. Companion Anim. Med.*, 31(4): 140-145.

15. Lew-Kojrys, S., Mikulksa-Skupien, E., Snarska, A., Krystkiewicz, W. and Pomanowski, A. (2017) Evaluation of clinical signs and causes of lower urinary tract disease in polish cats. *Vet. Med.*, 62(7): 386-393.

16. Kruger, J.M., Osborne, C.A., Goyal, S.M., Wickstorm, S.L., Johnston, G.R., Fletcher, T.F. and Brown, P.A. (1991) Clinical evaluation of cats with lower urinary tract disease. *J. Am. Vet. Med. Assoc.*, 199(2): 211-216.

17. Pusoonthornthum, R., Pusoonthornthum, P. and Osborne, C.A. (2012) Risk factor of feline lower urinary tract disease in Thailand. *Thai. J. Vet. Med.*, 42(4): 517-522.

18. O’neill, D.G., Church, D.B., McGreevy, P.D., Thomsin, P.C. and Brooebelt, D.C. (2014) Prevalence of disorder recorded in cats attending primary-care veterinary practice in England. *Vet. J.*, 202(2): 286-291.

19. Bambang, S. and Setyawan, B. (2018) Epidemiologi Veteriner Analitik. Gadjah Mada University Press, Yogyakarta.

20. Buffington, C.A.T. (2008) Special report: Dry foods and risk of disease in cats. *Can. Vet. J.*, 49(6): 561-563.

********