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Aetiological spectrum and diagnostic practices in cats with abdominal manifestations: A retrospective study of 290 cases

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Abstract: Feline abdominal manifestations represent a common yet clinically non-specific presentation associated with a broad differential diagnosis. This retrospective study, conducted between 2022 and 2024 at a national veterinary teaching hospital, aimed to characterise the aetiological spectrum and describe the diagnostic practices employed in cats presenting with abdominal signs. We included 290 cats in the analysis. In this cohort, intestinal parasitism was the most frequently identified cause (56.5%), demonstrating a significant association with young age (OR = 5.82) and male sex. Other diagnoses comprised infectious diseases (19.6%), feline lower urinary tract disease (9.7%), and suspected intoxications (9.3%). Diagnostic investigations followed a structured clinical protocol and included systematic coprological examination using flotation and concentration techniques, supplemented by routine laboratory testing for protozoan infections, all of which yielded negative results. We assessed the pancreas via serum amylase and trypsin-like immunoreactivity (TLI) measurements, and identified no cases consistent with pancreatitis. In cats with suspected urinary tract disease, we performed a complete urinalysis, including urine specific gravity, sediment examination, and bacteriological culture, alongside abdominal ultrasonography. Abdominal ultrasonography demonstrated high diagnostic agreement for urinary tract disorders ($\kappa = 0.88$) and substantial agreement for effusions associated with feline infectious peritonitis ($\kappa = 0.75$). Among the 145 cases with available follow-up data, 94.5% achieved complete resolution of clinical signs. Collectively, these findings provide descriptive clinical data on the distribution of abdominal diseases in this population and underscore the contribution of parasitological and imaging investigations to routine veterinary practice.

Keywords: abdominal disorders; Algeria; feline; therapeutic management; underlying causes

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Abdominal manifestations represent a frequent yet diagnostically challenging presentation in feline practice. The clinical spectrum including vomiting, diarrhoea, abdominal distension, and pain-related behavioural changes often belies considerable aetiological heterogeneity (Steagall and Monteiro 2019; Tomsic et al. 2021). The subtle expression of visceral discomfort in cats, combined with the anatomical diversity of potential underlying pathologies, necessitates a systematic diagnostic approach (Steagall and Monteiro 2019).

Differential diagnoses span multiple systems gastrointestinal, hepatobiliary, urogenital, peritoneal, and may range from benign parasitic infection to life-threatening surgical conditions (Catanzaro et al. 2016; Tomsic et al. 2021). Accurate aetiological identification is therefore essential for guiding appropriate therapeutic and prognostic decisions.

The epidemiological profile of feline abdominal disease varies geographically, reflecting differences in preventive care, environmental exposure, population structure, and diagnostic capacity. In Western Europe and North America, metabolic disorders and neoplasia are more frequently reported in ageing feline populations (Wilson et al. 2016; O'Neill et al. 2023). Conversely, infectious and parasitic aetiologies remain prevalent where routine prophylaxis is applied less consistently (Symeonidou et al. 2018; Hadj Slimane et al. 2022). Despite region-specific risk factors, data from North African veterinary populations remain scarce, representing a notable gap in the comparative literature.

Most published studies focus on individual conditions or case series, and few comprehensive analyses integrate epidemiological and diagnostic data. Moreover, researchers have largely assessed the performance of routinely available investigations such as coprological examination, rapid antigen testing, and imaging in resource-rich environments, limiting extrapolation to settings with constrained diagnostic access.

Accordingly, the objectives of this retrospective study were threefold: first, to characterise the aetiological spectrum of abdominal manifestations in a cohort of cats presented to a veterinary teaching hospital in Algeria; second, to evaluate demographic associations with major disease categories; and third, to assess the diagnostic contribution of routinely available investigations within a structured clinical framework. By generating region-specific epidemiological data and evaluating diagnostic agreement in a resource-limited setting, this study aims to inform contextualised clinical decision-making and contribute to the comparative understanding of feline abdominal disease globally.

MATERIAL AND METHOD

Study design and ethical considerations

This retrospective descriptive and analytical study reviewed clinical records of cats presenting with abdominal manifestations. Although the analysis was retrospective, the authors examined, diagnosed, and treated all animals during routine clinical practice.

The study was conducted in accordance with World Organisation for Animal Health (WOAH) recommendations regarding animal welfare, and all procedures were performed within the framework of routine veterinary clinical care. No experimental procedures were carried out on the animals; the study population and case selection were as follows.

Study population

The study was conducted between January 2022 and December 2024 at the Department of Domestic Carnivore Medicine of the Higher National Veterinary School of Algiers (Algeria). During this period, 1 425 client-owned cats were presented for consultation, of which 290 exhibiting abdominal manifestations were included in the study population. The demographic characteristics of these cats, obtained from clinical records, were as follows: 196 males and 94 females; 193 domestic or mixed-breed cats and 97 purebred cats. The age distribution included 75 cats under one year, 112 aged one to three years, 73 aged four to six years, and 30 cats over six years of age.

The overall hospital population during the study period comprised 1 425 cats, with the following demographic distribution: 812 males (57.0%) and 613 females (43.0%); 898 domestic shorthair (63.0%) and 527 purebred (37.0%) cats. Age distribution was as follows: 321 cats under one year (22.5%), 498 aged one to three years (34.9%), 387 aged four to six years (27.2%), and 219 cats over six years (15.4%).

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Case definition and inclusion criteria

For the purposes of this study, abdominal manifestations were defined as the presence of at least one clinical sign suggestive of abdominal involvement, including: vomiting, diarrhoea, abdominal distension, vocalisation during abdominal palpation, defensive reaction to abdominal palpation, marked abdominal muscle tension, painful posture, or behavioural signs suggestive of abdominal pain. We included cats regardless of sex, age, or breed if one or more of these signs were recorded during clinical examination.

Animals were excluded when abdominal signs were clearly attributable to recent abdominal trauma, when pain originated from musculoskeletal or generalised systemic causes, when the consultation was related to routine preventive care (vaccination or health check), or when systemic diseases were present without concurrent abdominal manifestations.

Clinical examination and diagnostic procedures

All enrolled cats underwent a standardised diagnostic protocol consisting of a complete clinical examination, haematology, serum biochemistry profile, and abdominal ultrasonography and/or radiography. The clinical examination included a general physical assessment, abdominal palpation, rectal temperature measurement, hydration status assessment, mucous membrane assessment, and pain evaluation.

Haematological assessment comprised a complete blood count with red blood cell, white blood cell, and platelet counts, haematocrit, haemoglobin concentration, and differential leukocyte count. Serum biochemistry included alanine aminotransferase (ALT), aspartate aminotransferase (AST), urea, creatinine, glucose, total protein, albumin, and electrolytes.

Abdominal ultrasonography was performed in 290 cats and abdominal radiography in 85 cats, depending on clinical indications. Ultrasonographic evaluation included assessment of gastrointestinal wall thickness, intestinal motility, abdominal effusion, organ size, and the echogenicity of the liver, spleen, and kidneys. Radiographic examination focused on abdominal organ size, presence of foreign bodies, intestinal obstruction, and abdominal effusion. Additional diagnostic procedures were performed as clinically indicated.

For analysis, we assigned a single primary diagnosis to each case based on the predominant clinicopathological findings responsible for the abdominal manifestations. Although concurrent disorders may have been present in some individuals, only the principal aetiological category was retained for statistical analysis.

Diagnostic criteria (reference standard)

To ensure diagnostic consistency and address methodological concerns about diagnostic validity, we established predefined confirmation criteria for each disease category.

1. Intestinal parasitism: All cats underwent coprological analysis using sucrose flotation and the formalin-ether concentration method (Ritchie technique). Specific investigations for protozoan infections included direct microscopic examination of fresh faecal smears, permanent staining (Giemsa and trichrome), and repeated sampling over consecutive days when clinically indicated. This study did not investigate blood protozoan parasites (such as *Babesia* or *Hepatozoon* species), as they were not part of the routine diagnostic protocol for cats presenting with abdominal signs. In contrast, coprological examination detected intestinal coccidian parasites (*Cystoisospora* spp.), as reported in the results.
2. Feline panleukopenia (FPV): Feline panleukopenia was diagnosed based on compatible clinical signs, severe leukopenia on complete blood count, and a positive result on a faecal antigen rapid test (FPV Ag) when available. Cases without a positive antigen test were not classified as confirmed FPV.
3. Suspected intoxication: Cases were classified as suspected intoxication when a documented history of exposure was available, clinical signs were compatible with known toxic syndromes, and supportive laboratory abnormalities were present. Systematic toxicological laboratory confirmation was not available; therefore, these cases were classified as clinically suspected rather than analytically confirmed intoxications.
4. Intestinal occlusion: Diagnosis required compatible acute abdominal signs, radiographic evidence

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of obstruction, and, when performed, surgical confirmation.

5. Feline lower urinary tract disease (FLUTD): In cats with suspected lower urinary tract disease, we performed a complete urinalysis, including urine specific gravity measurement, biochemical analysis, microscopic examination of the urinary sediment, and bacteriological culture with antimicrobial susceptibility testing. We also performed abdominal ultrasonography to evaluate structural abnormalities of the urinary tract.
6. Feline infectious peritonitis (FIP): Because molecular diagnostics were limited, we diagnosed effusive FIP by integrating multiple criteria. These included compatible clinical signs, abdominal effusion, and comprehensive effusion analysis encompassing macroscopic appearance, protein concentration, cellularity, cytological evaluation, and the Rivalta test when FIP was suspected. Additional supportive findings comprised a serum albumin-to-globulin ratio below 0.6, hyperglobulinaemia, and characteristic ultrasonographic abnormalities. Definitive confirmation via immunohistochemistry or RT-PCR was not systematically available. Accordingly, we diagnosed FIP through a clinicopathological consensus approach consistent with routine clinical practice. We cannot entirely exclude potential misclassification bias.
7. Pancreatic assessment: We evaluated pancreatic involvement by measuring serum amylase activity and trypsin-like immunoreactivity (TLI). Based on integrated clinical, laboratory, and imaging findings, no cases consistent with pancreatitis were identified in the study population.

Endoscopic examination of the gastrointestinal tract was not performed in this study.

Follow-up and outcome assessment

Follow-up was achieved in 145 of 290 cases (50%) through clinical re-examination or telephone interview. We defined treatment success as complete resolution of clinical signs. All 60 cats with intestinal parasitism fully recovered after treatment. Among 15 panleukopenia cases, 13 recovered and two died. All three intestinal occlusion cases recovered after surgery. The nine suspected intoxication cases showed favourable outcomes, while 30 FLUTD cases required long-term monitoring. Of 33 FIP cases, 28 died, and five survived temporarily, confirming the poor prognosis associated with this disease. Cases lost to follow-up were excluded from outcome analysis but retained for prevalence calculations. Telephone interviews, while practical for retrospective follow-up, are inherently subject to recall bias and lack the objectivity of in-person clinical re-evaluation. This limitation should be considered when interpreting outcome data.

Statistical analysis

We conducted all statistical analyses using IBM SPSS Statistics v26 (IBM Corp., Armonk, NY, USA). We computed descriptive statistics for all demographic variables. Associations between abdominal manifestations and categorical variables (sex, breed, and age group) were examined using chi-squared (χ^2) tests. We calculated odds ratios (OR) with corresponding 95% confidence intervals (95% CI) to quantify the magnitude of these associations. Where appropriate, we used multivariable logistic regression to identify independent predictors.

Age was stratified into predefined categories. For analysis, we compared each age category with the combined population of all remaining age categories to derive odds ratios and 95% confidence intervals.

We assessed concordance between clinical suspicion and definitive diagnosis using Cohen's kappa coefficient (κ), with 95% confidence intervals calculated using the asymptotic standard error method. We interpreted diagnostic agreement according to standard criteria: $\kappa > 0.80$ indicated excellent agreement, 0.61–0.80 substantial agreement, 0.41–0.60 moderate agreement, and ≤0.40 fair to poor agreement (Hosmer and Lemeshow 2000).

RESULTS AND DISCUSSION

Epidemiological characteristics

Of the 1 425 cats presented during the study period, 290 (20.3%) met the inclusion criteria for abdominal manifestations. The cohort comprised 196 males and 94 females, including 193 domestic shorthair cats and 97 purebred individuals

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(43 Siamese, 32 Persian, and 22 British Shorthair). Age distribution was as follows: 75 cats under one year, 112 aged one to three years, 73 aged four to six years, and 30 cats over six years of age. A statistically significant association between male sex and several abdominal conditions was identified (Table 1); however, interpretation of these associations requires consideration of the underlying population structure and potential differences in behavioural or environmental exposures. For analytical purposes a single primary diagnosis was assigned to each case based on the predominant clinical and diagnostic findings.

Intestinal parasitism

Intestinal parasitism was the most frequently identified aetiology, accounting for 56.5% (164/290) of cases. Significant associations were observed with young age (OR = 5.82; $P < 0.001$) and male sex (OR = 1.86; $P < 0.001$) (Table 1). A modest but statistically significant association with domestic shorthair cats was also noted (OR = 1.44; $P = 0.033$). The predominance in young cats aligns with previous reports describing increased susceptibility during early life due to immature immune function and environmental exposure (Symeonidou et al. 2018; Kwak and Seo 2020). The observed male predisposition is consistent with other epidemiological studies (de Souza et al. 2017), although behavioural factors such as increased outdoor access rather than intrinsic biological susceptibility, are frequently implicated. Outdoor access and raw meat feeding, commonly recorded in affected cats, are recognised risk factors for parasitic infection (Adhikari et al. 2023). The notably high prevalence of intestinal parasitism (56.5%) substantially exceeds reports from European tertiary centres (typically 15–25%), likely reflecting limited routine antiparasitic prophylaxis and outdoor access patterns in the study population. This finding underscores the need for systematic deworming programmes in Algerian feline practice. Clinical signs were predominantly non-specific, including diarrhoea, vomiting, weight loss, abdominal distension, and discomfort (Table 2), in agreement with established descriptions of feline intestinal parasitosis (Symeonidou et al. 2018; Adhikari et al. 2023). Coprological examination demonstrated excellent diagnostic agreement ($\kappa = 0.85$), supporting its utility as a first-line investigation (Lima et al. 2021; Adhikari et al. 2023). *Toxocara cati* was the most frequently detected parasite, identified in 40.2% (66/164) of parasitised cats, followed by *Dipylidium caninum* (25.6%), the intestinal coccidian *Cystoisospora rivolta* (17.7%), and *Toxascaris leonina* (16.4%); this distribution is consistent with previously reported prevalence in feline populations (Lima et al. 2021; Hadj Slimane et al. 2022; Adhikari et al. 2023). Antiparasitic treatment protocols followed current therapeutic recommendations (Lee et al. 2019; Sweet et al. 2020).

Feline panleukopenia

Feline panleukopenia was diagnosed in 24 cats (8.3%) based on the combination of compatible clinical signs, severe leukopenia on complete blood count, and a positive antigen detection test when available. We observed a significant association with domestic shorthair cats ($P = 0.017$), but no statistically significant association with sex or age (Table 1). Although we observed a numerical male predominance (16 males vs 8 females, ratio 2 : 1), this association did not reach statistical significance ($P = 0.147$), likely because of the limited sample size and the resulting wide confidence interval. Similarly, the absence of a significant age association contrasts with classical epidemiological patterns (Rehme et al. 2022) and may reflect inadequate vaccination coverage across age groups rather than true biological resistance in adults. This hypothesis is supported by the predominance of domestic shorthair cats in this subgroup, which may have less access to veterinary care than purebred counterparts. Clinical presentation was consistent with severe enteritis and systemic compromise (Abdel-Baky et al. 2023). The faecal antigen test showed substantial agreement with clinical suspicion ($\kappa = 0.72$) (Table 2), comparable to previous performance evaluations (Awad et al. 2018; Abdel-Baky et al. 2023). Management remained supportive, as no specific antiviral therapy is available (Rice 2017).

Suspected intoxication

Twenty-seven cases were classified as suspected intoxication. Significant associations were observed with male sex ($P = 0.007$) and age over six years ($P = 0.018$), whereas breed was not statistically

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Table 1. Source of abdominal manifestations and demographic features in cats

Source of abdominal manifestations (*n*)	Variables	Category	No. cases prevalence (%)	Odds ratio (OR)	95% confidence interval (CI)	*P*-value
Digestive						
Intestinal parasites (164)	sex	male	107 (14.4)	1.86	1.32–2.61	**<0.001**
		female (ref)	57 (8.3)			
	breed	purebred	62 (14.2)	1.44	1.03–2.02	**0.033**
		domestic shorthair (ref)	102 (10.3)			
	age (year)	<1	63 (34.1)	5.82	4.04–8.39	**<0.001**
		1–3	65 (13)	1.25	0.90–1.75	0.187
		4–6	26 (4.1)	0.20	0.13–0.31	**<0.001**
		>6	10 (10)	0.84	0.43–1.65	0.624
Feline panleukopenia (24)	sex	male	16 (2.2)	1.86	0.79–4.37	0.147
		female (ref)	8 (1.2)			
	breed	purebred	2 (0.5)	0.20	0.05–0.85	**0.017**
		domestic shorthair (ref)	22 (2.2)			
	age (year)	<1	5 (2.7)	1.79	0.66–4.85	0.249
		1–3	10 (2)	1.33	0.59–3.02	0.493
		4–6	6 (0.9)	0.40	0.16–1.01	0.047
		>6	3 (3)	1.92	0.56–6.55	0.632
Suspected intoxication (27)	sex	male	21 (2.8)	3.30	1.32–8.23	**0.007**
		female (ref)	6 (0.9)			
	breed	purebred	7 (1.6)	0.79	0.33–1.88	0.597
		domestic shorthair (ref)	20 (2)			
	age (year)	<1	2 (1.1)	0.53	0.12–2.26	0.452
		1–3	9 (1.8)	0.93	0.41–2.09	0.862
		4–6	11 (1.7)	0.84	0.39–1.82	0.655
		>6	5 (5)	3.12	1.16–8.42	**0.018**
Intestinal occlusion (3)	sex	male	3 (0.4)	–	–	0.095
		female (ref)	0 (0)			
	breed	purebred	0 (0)	–	–	0.249
		domestic shorthair (ref)	3 (0.3)			
	age (year)	<1	1 (0.5)	3.36	0.30–37.24	0.560
		1–3	2 (0.4)	3.72	0.34–41.13	0.597
		4–6	0 (0)	–	–	0.117
		>6	0 (0)	–	–	0.632
Urinary						
Feline lower urinary tract disease (39)	sex	male	30 (4)	3.16	1.49–6.71	**0.002**
		female (ref)	9 (1.3)			
	breed	purebred	18 (4.1)	1.98	1.04–3.75	**0.033**
		domestic shorthair (ref)	21 (2.1)			
	age (year)	<1	0 (0)	–	–	**0.015**
		1–3	12 (2.4)	0.82	0.41–1.63	0.572
		4–6	18 (2.8)	1.05	0.55–1.99	0.888
		>6	9 (9)	4.27	1.97–9.27	**<0.001**

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Table 1 to be continued

Source of abdominal manifestations (*n*)	Variables	Category	No. cases prevalence (%)	Odds ratio (OR)	95% confidence interval (CI)	*P*-value
Abdominal effusions						
Feline infectious peritonitis (33)	sex	male	19 (2.6)	1.26	0.63–2.53	0.517
		female (ref)	14 (2)			
	breed	purebred	8 (1.8)	0.72	0.32–1.61	0.424
		domestic shorthair (ref)	25 (2.5)			
	age (year)	<1	4 (2.2)	0.92	0.32–2.65	0.317
		1–3	14 (2.8)	1.38	0.69–2.78	0.368
		4–6	12 (1.9)	0.69	0.34–1.41	0.315
		>6	3 (3)	1.34	0.40–4.47	0.480

Reference categories: female sex and domestic shorthair. We calculated odds ratios (OR) using logistic regression

Table 2. Clinical presentation and diagnostic confirmation of abdominal manifestations in cats (290)

Source of abdominal manifestations	Clinical signs	Diagnostic methods	Cohen's κ (95% CI)
Digestive disorders			
Intestinal parasitism (164)	diarrhoea, vomiting, weight loss, abdominal distension	coprological analysis	0.85 (0.76–0.94)
Feline panleukopenia virus infection (24)	pyrexia, vomiting, haemorrhagic diarrhoea	rapid antigen diagnostic test	0.72 (0.55–0.89)
Suspected intoxication (27)[1]	vomiting, haemorrhagic diarrhoea, mydriasis, hypersalivation, neurological signs, cardiovascular abnormalities, abdominal pain	anamnesis + blood tests + toxicological identification	0.45 (0.32–0.58)
Intestinal occlusion (3)[2]	severe abdominal pain, vomiting	radiography	0.65 (0.25–1.00)
Urinary tract disorders			
Feline lower urinary tract disease (39)	dysuria, pollakiuria, haematuria, stranguria, excessive grooming of perineum, anuria, abdominal pain, reluctance to ambulate, vocalisation, lethargy, vomiting, anorexia, cardiovascular compromise	ultrasound + urine biochemistry	0.88 (0.76–1.00)
Abdominal effusion			
Feline infectious peritonitis (33)	abdominal distension, anorexia, lethargy, hyperthermia, muscle wasting, dyspnoea	effusion biochemistry + ultrasound	0.75 (0.61–0.89)

Cohen's kappa coefficient (κ) represents agreement between clinical suspicion and definitive diagnosis (1 = perfect agreement, 0 = chance agreement). 95% confidence intervals (CI) calculated by asymptotic method. [1]Includes household chemicals, pesticides, human medications, and toxic plants. [2]Wide confidence interval reflects limited sample size (n = 3)

significant (Table 1). Similar demographic trends have been described in retrospective toxicological surveys (Markert et al. 2023). The range of suspected toxic agents corresponded to commonly reported feline exposures and included: household chemicals (7 cases), specifically cleaning products (bleach, detergents); rodenticides (5 cases), mainly anticoagulant types (brodifacoum, bromadiolone); insecticides (6 cases), including organophosphates and pyrethroids; medications (5 cases), comprising non-steroidal anti-inflammatory drugs (ibuprofen, paracetamol); and toxic plants (4 cases), primarily *Lilium* species (lilies) and *Dieffenbachia*. The predominance of rodenticides and insecticides among

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suspected agents may be explained by owner-related behaviours, including the storage or use of such products in areas accessible to cats, as well as the common practice of self-medication, whereby owners administer human or veterinary medications to their animals without appreciating their potential toxicity. Clinical manifestations varied according to exposure and included gastrointestinal, neurological, cardiovascular, and urinary signs (Table 2), consistent with previous descriptions (Allkamper et al. 2018; Lundgren et al. 2024). Diagnosis was based on integrated clinical assessment, as toxicological confirmation was not systematically available, a methodological limitation that should be considered when interpreting these findings. Therapeutic management followed established supportive and antidotal strategies (Allkamper et al. 2018), aligning with general toxicological management recommendations (Zhang et al. 2018).

Intestinal occlusion

We recorded three cases of intestinal occlusion. Owing to the small sample size, statistical interpretation remains limited. Radiographic examination showed high diagnostic performance (Table 2), consistent with previous reports highlighting imaging as a key diagnostic tool in feline gastrointestinal obstruction (MacPhail 2002). The predominance of young male cats in this subgroup should be interpreted cautiously given the small sample size.

Feline lower urinary tract disease (FLUTD)

Feline lower urinary tract disease accounted for 39 cases. We confirmed a strong association with male sex ($P = 0.002$) (Table 1), consistent with established anatomical predisposition (Beeston et al. 2022). We also observed an increased risk in purebred cats ($P = 0.033$), potentially reflecting genetic susceptibility to urolithiasis, as previously discussed (Merindol et al. 2023).

Clinical presentation was consistent with classical lower urinary tract signs (Stella et al. 2011; Westropp et al. 2019; O'Neill et al. 2023). We performed urinalysis in all cases, including urine specific gravity, pH, protein content, and microscopic sediment examination for crystals, erythrocytes, and leukocytes. Combined urinalysis and ultrasonography showed high diagnostic agreement ($\kappa = 0.88$; Table 2), consistent with prior studies (Beeston et al. 2022; Remichi et al. 2020). Therapeutic approaches, including catheterisation and urethrostomy in selected cases, were consistent with contemporary management strategies (Beeston et al. 2022; Merindol et al. 2023).

Feline infectious peritonitis (FIP)

Thirty-three cases were classified as effusive FIP. Male predominance was observed but did not reach statistical significance (Table 1), consistent with previously reported demographic patterns (Pesteanu-Somogyi et al. 2006). The higher proportion of young cats aligns with established epidemiological data (Rohrbach et al. 2001; Tsai et al. 2011). The predominance of domestic shorthair cats likely reflects local population structure rather than breed-specific susceptibility, as suggested in prior studies (Pesteanu-Somogyi et al. 2006; Bell et al. 2006). Clinical and ultrasonographic findings corresponded to classical descriptions of effusive FIP (Rand et al. 1994; Foley et al. 1998). In affected cats, the abdominal effusion was typically straw-coloured, viscous, and characterised by high protein concentration (>35 g/l) with moderate cellularity dominated by macrophages and neutrophils.

As previously reported, no single ante-mortem test definitively confirms FIP (Lewis and O'Brien 2010; Pedersen 2014). Diagnosis therefore relied on integrated clinicopathological criteria, including decreased albumin-to-globulin ratio and the aforementioned effusion characteristics, consistent with current recommendations (Pedersen 2009; Tasker 2018; Felten and Hartmann 2019; Berliner 2021). The absence of systematic molecular confirmation (immunohistochemistry or RT-PCR) represents a significant methodological limitation, and potential misclassification bias cannot be excluded. Palliative management reflected historical therapeutic approaches (Kameshima et al. 2020) and survival times were consistent with published outcomes in untreated effusive FIP.

Study limitations

The retrospective design may have introduced selection bias dependent upon the completeness

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of medical records. Diagnostic confirmation for feline infectious peritonitis and suspected intoxications lacked definitive laboratory verification, potentially affecting classification accuracy. Small subgroup sizes reduced statistical power for certain conditions, and the authors applied no formal correction for multiple comparisons, so significance tests should be interpreted cautiously. Furthermore, follow-up information was incomplete (available for 50% of cases), and telephone interviews for outcome assessment may have introduced recall bias, limiting the robustness of the outcome evaluation.

This study provides region-specific epidemiological data from an underrepresented veterinary setting, confirming that intestinal parasitism, urinary disorders, and infectious diseases predominate among cats presenting with abdominal manifestations in Algeria. The findings support implementing structured, multimodal diagnostic protocols while highlighting the need for prospective studies incorporating definitive diagnostic confirmation, particularly molecular methods for feline infectious peritonitis and toxicological analysis for suspected intoxication.

Conflict of interest

The authors declare no conflict of interest.

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