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Inflammatory bowel diseases in dogs

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Abstract

The term 'Inflammatory Bowel Disease (IBD)' is applied in Veterinary Medicine to idiopathic infiltration of inflammatory cells in the intestinal mucosa, which characterizes by clinical signs like vomiting, anorexia, large and small bowel diarrhoea, borborygmus and flatulence occurs in any area of the gastrointestinal tract. The aetiology of IBD is multi-factorial. The chronic infection due to gastric protozoa, idiopathic damage to mucosal barrier, food allergy to any commercial product or prevailing gastro intestinal diseases contribute to IBD occurrence. However, its severity and therapeutic plan could be decided based on Canine IBD Activity Index (CIBDAI). The faecal score 6-7 mostly reported in IBD cases. The anaemia, neutrophilia, eosinophilia, thrombocytopenia are major haematological alterations. The C-Reactive protein is an inflammatory marker which usually found increased while folate and cobalamin decrease in reported cases of IBD in dogs. The comprehensive therapeutic approach is required to treat the IBD in dogs which includes use of pre and post biotic, antibacterial to counteract intestinal dysbiosis and immunosuppressive agents.

Keywords: CIBDAI, C-Reactive protein, inflammatory bowel disease, Synfosium

Introduction

The 'Inflammatory Bowel Disease' term is applied in Veterinary Medicine to idiopathic inflammation which is characterized by infiltration of inflammatory cells in the intestinal mucosa and occurs in any area of the gastrointestinal tract (Suchodolski *et al.*, 2012) [12]. Chronic Enteropathy (CE) is a term used for diseases of the intestines regardless of etiology and pathogenesis and it is otherwise called Inflammatory Bowel Disease (IBD). In humans IBD, includes two different chronic disorders characterized by inflammation of the intestinal wall: Crohn's Disease (CD) and Ulcerative Colitis (UC).

IBD is one of the under or un-diagnosed disease of dogs due lack of information and availability of diagnostic modalities. The repeated inflammation and microcirculation disorders can cause intestinal fistulae, stenosis, obstruction, perforation, Gastrointestinal (GI) bleeding, sepsis, and other complications, increasing the risk of intestinal cell cancerization and death. (Kaplan and Windsor, 2021) [8].

1. Epidemiology

The Arslan (2017) [2] stated that there is no information available about IBD in dogs and cats. However, 0.1 percent (33/30535) incidence was reported by Bhavani *et al.* (2023) [3] in study conducted at Madras Veterinary College, Chennai. There is no apparent age, sex, or breed predisposition associated with IBD in animals; however, it may be more common in Non -descript, German Shepherds, Labrador, Doberman, Rottweiler, Pug, Lhasa apso and Cocker Spaniels (Bhavani *et al.*, 2023) [3].

2. Classification

The different forms of IBD recognised are based on their histological description like Lymphocytic-Plasmocytic Enteritis (LPE), Eosinophilic Gastroenteritis (EGE), Granulomatous (Regional) Enteritis and Histiocytic ulcerative colitis.

3. Etiopathogenesis

The aetiology of IBD in dogs is unknown, but comparisons have been made with human IBD where the breakdown of immunological tolerance to luminal bacterial antigens is thought to be

Critical. The breakdown may result from disruption of the mucosal barrier, dysregulation of the Gut Associated Lymphoid Tissue (GALT), or disturbances in the microbial flora, or any combination of these factors.

Toll-Like Receptors (TLRs) are found on the basolateral surface of enterocytes. The receptors recognise pathogen-Associated Molecular Patterns (PAMPs) on invading bacteria via intracellular signalling. TLRs stimulate the nuclear transcription factor NF-κB, which activates the transcription of the mRNA encoding pro-inflammatory cytokines such as Tumour Necrosis Factor (TNFα) and Various Interleukins (IL), thereby triggering the inflammatory cascade.

Ultimately, the mucosal immune response is aimed at eliminating the pathogen completely. Unfortunately, bystander damage of host cells is almost inevitable, although if the antigenic challenge is contained, the danger signals will diminish, and so the mucosa will be repaired and normal tolerance will be restored. However, Kimmel *et al.* (2000) [9] observed, if the danger persists, either because the mucosal barrier remains breached and the pathogenic insult continues, or because of an inherent abnormality in the GALT, a state of chronic inflammation ensues.

5. Clinical Signs

The predominant signs exhibited by dogs are vomiting, small bowel diarrhoea (loose-watery or melena), large bowel diarrhoea with tenesmus, fresh blood/mucus and urgency. Besides this, pica specially eating grass (German *et al.*, 2010) [5], weight loss, flatulence and borborygmus sound and abdominal pain were also observed.



Fig 2: Watery diarrhoea



Fig 3: Mucoid faeces

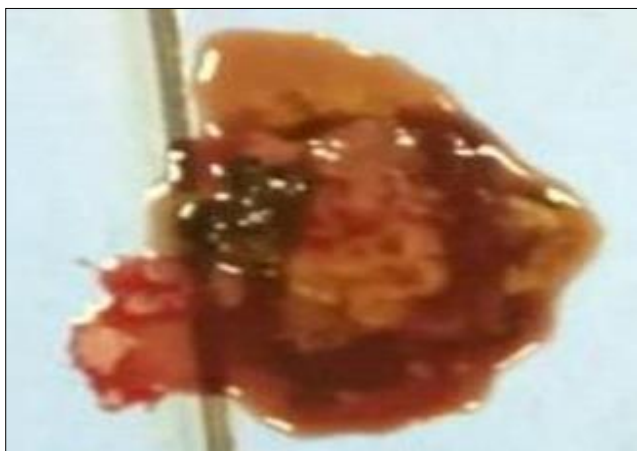


Fig 1: Haematochezia



Fig 4: Emaciation

Canine IBD Activity Index (CIBDAI)

Clinical activity indices remain the most widely used tools in assessing disease activity in human IBD, both as a measure of the initial response to individual treatments and to long-term prognosis. Similar scoring systems have now been designed for use in the dog. The CIBDAI is a numerical clinical scoring index composed of six variables (Jergens and Simpson, 2012) [6].

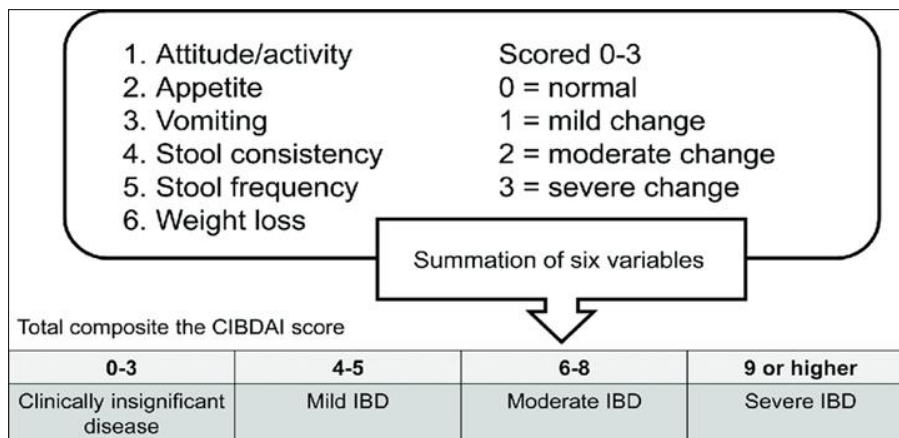


Fig 5: Scoring system of Canine IBD Activity Index

Diagnosis

The history, clinical examination, haemato-biochemistry, CRP, folate and cobalamin estimation, fecal examination and diagnostic imaging can be sufficient to suspect a dog for IBD in Indian clinical scenario.

1. **History:** Presence of persistent diarrhoea and straining while defecation
2. **Clinical examination:** Dehydrated, muscle wasting and malena
3. **Haemato-biochemistry:** Haematological examination in IBD is often unhelpful, although sometimes a neutrophilia, with or without a left shift is observed. Hypoalbuminaemia is found more frequently in canine IBD and has been correlated with a poorer prognosis (Allenspach *et al.*, 2007) [1]. Hypocholesterolaemia was also reported in dogs and quite a good marker of malabsorption. In addition to this, hypocalcaemia and hypomagnesaemia may occur.
4. **CRP estimation:** C-Reactive protein considered as whole mark of inflammation thus, increment in value in IBD suggestive of sever inflammation. The CRP are usually found 24.39±2.48 mg/dL (Bhavani *et al.*, 2023) [3].
5. **Folate and Cobalamin Estimation:** Serum concentrations of both of these vitamins may be reduced

by anorexia and intestinal malabsorption. Therefore, subnormal folate (2.36±0.32 µg/L) (proximal inflammation) or cobalamin (408.86±37.58 ng/L) (distal inflammation) concentrations or both (diffuse inflammation) are indicative of IBD (Ruaux *et al.*, 2009) [10].

6. **Faecal examination:** Faecal examination by direct wet mount or flotation techniques is important to rule out parasitic causes (protozoa, nematodes) for mucosal inflammation.

Fecal culture

Bacterial culture can be a useful technique for detection of specific enteropathogens (e.g *Salmonella spp.*, *Campylobacter spp.*).

Fecal cytology

Fecal cytology is a simple, non-invasive, and cheap test that can be useful in the diagnosis of GI disorders. It can be performed by smear of feces collected for rectal scraping and stained with Diff-Quik (Romanowski stain).

Fecal score

Fecal score 6-7 were usually found in the cases of IBD in dogs (Burton *et al.*, 2016) [4].

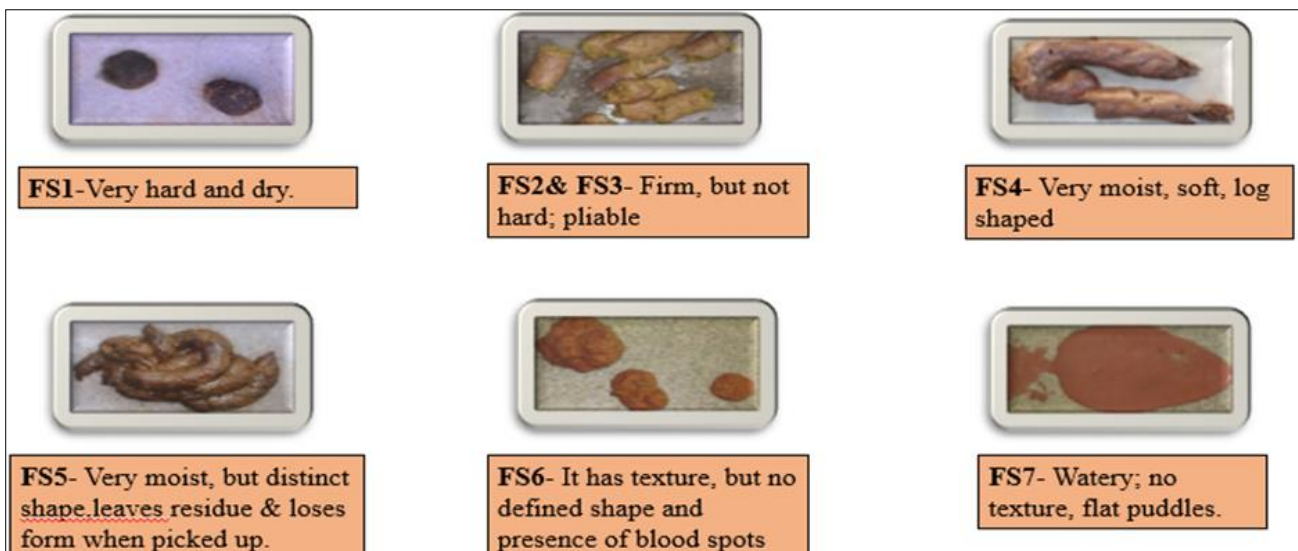


Fig 6: Fecal score from FS-1 to FS-7

Diagnostic imaging

Common alterations of abdominal ultrasound in dogs with chronic enteropathy is shown in Fig.7. The striations represent

dilated lacteals. This dog had long history of IBD. Peritoneal effusion is present (Showing * in Fig.7AB) the thickened & hyperechoic adjacent fat (Showing F in Fig.7A).

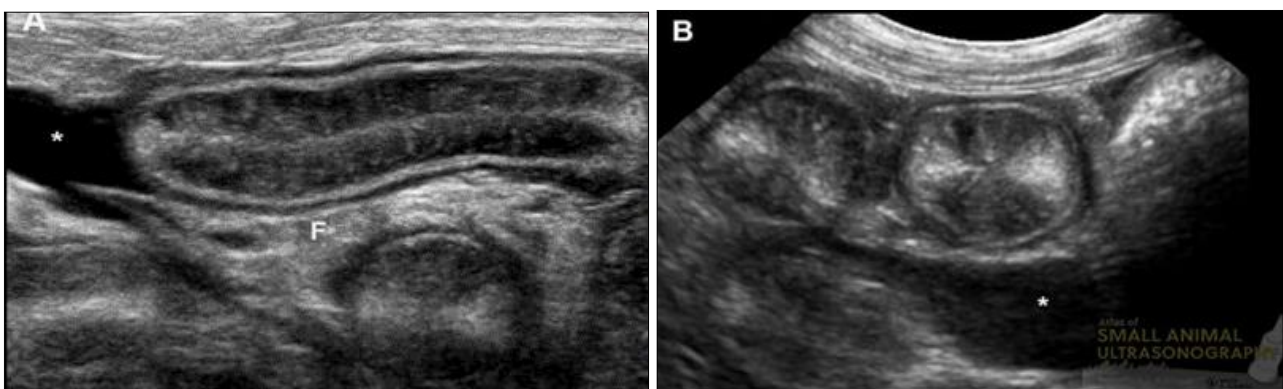


Fig7: Mucosal hyperechoic striations a) longitudinal & b) transverse sonograms of thickened jejunal segments with hyperechoic linear striations within the mucosal layer

Treatment

1. Nutritional therapy: The rationale for dietary therapy of IBD is that restricting exposure to antigens (i.e., dietary proteins) known to evoke sensitivity will reduce exaggerated host responses and attenuate intestinal inflammation.

Home Made Diet: Tilapia and sweet potato diet are most suitable for IBD infected dogs.

2. Drug therapy: Drug therapy for canine IBD includes the use of corticosteroids, antibiotics, and various immunosuppressive agents (Jergens *et al.*, 2010) [6].

A. Antibacterial therapy

Metronidazole or enrofloxacin is the preferred antibacterial for small animals. Other antibacterial e.g., oxytetracycline and tylosin may also have immunomodulatory effects. (Arslan, 2017) [2]

B. Immunosuppressive drug

The most important treatment in IBD is immunosuppression. Corticosteroids are commonly first choice for the treatment of IBD in dogs. According to retrospective studies, prednisolone is the most used drug alone or in combination. Budesonide is a non-halogenated glucocorticoid that was developed for IBD in humans. Budesonide has fewer side effects than systemic corticosteroids. In dogs budesonide can be used for treatment of allergic dermatitis (topically), chronic inflammatory airway disease (aerosol) and IBD. Cyclosporine may show promise for the future in treating canine IBD, given its T lymphocyte-specific effects and its efficacy in canine anal furunculosis. Unfortunately, it is expensive but response to cyclosporine in 11/14 dogs with steroid-resistant enteropathy has been reported (Allenspach *et al.*, 2007) [1].

3. Probiotics and prebiotics: Prebiotics could reduce intestinal inflammation, oxidative stress and improve gut symbiosis. Veterinary specific pre-post biotic IBD product 'Synfosium' has shown excellent result in improving intestinal dysbiosis (Segarra *et al.*, 2016) [11].

As the treatment of IBD is life long, pet parents will be responsible for palliative care which not only improve the quality of life of affected dogs but also fasten the recovery from the disease.

Conclusions

Canine idiopathic IBD denotes a heterogeneous group of chronic, relapsing inflammatory disorders of the GI tract that are immunologically mediated. The major clinical signs of IBD in dogs are vomiting, diarrhea and weight loss, along with histopathologic inflammatory changes in stomach and intestinal mucosa. The grading and therapeutic response in IBD can be best evaluated based on CIBDAI. The elevated CRP and subnormal Folate, Cobalamin estimation will be useful for primary screening and further multiple diagnostic modalities are required to be applied for confirmative diagnosis of IBD. Symptomatic treatment should be targeted with prebiotics/probiotics, immunosuppressive therapy and antibiotics, if required.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Allenspach K, Wieland B, Grone A, Gaschen F. Chronic enteropathies in dogs: Evaluation of risk factors for negative outcome. *J Vet Intern Med.* 2007;21(4):700-708. DOI: 10.1111/j.1939-1676.2007.tb03011.x
2. Arslan HH. Inflammatory bowel disease and current treatment options in dogs. *Am J Anim Vet Sci.* 2017;12(3):150-158. DOI: 10.3844/ajavsp.2017.150.158
3. Bhavani SM, Kavitha S, Vairamuthu S, Vijayarani K, Bhat A. Clinical signs, activity indices and prognostic indicators in dogs with idiopathic inflammatory bowel Disease. *Indian J Anim Res.* 2023;57(11):1544-1549. DOI: 10.18805/IJAR.B-4399.
4. Burton EN, O'Connor E, Ericsson AC, Franklin CL. Evaluation of fecal microbiota transfer as treatment for postweaning diarrhea in research-colony puppies. *J Am Assoc Lab Anim Sci.* 2016;55(5):582-587.
5. German AJ, Hall EJ, Day MJ. Chronic intestinal inflammation and intestinal disease in dogs. *J Vet Intern Med.* 2003;17(1):8-20. DOI: 10.1111/j.1939-1676.2003.tb01318.x
6. Jergens AE, Simpson KW. Inflammatory bowel disease in veterinary medicine. *Front Biosci (Elite Ed).* 2012;4(4):1404-1419. DOI: 10.2741/470
7. Jergens AE, Crandell JM, Evans R, Ackermann M, Miles KG, Wang C. A clinical index for disease activity in cats with chronic enteropathy. *J Vet Intern Med.* 2010;24(5):1027-1033. DOI: 10.1111/j.1939-1676.2010.0549.x
8. Kaplan GG, Windsor JW. The four epidemiological stages in the global evolution of inflammatory bowel disease. *Nat Rev Gastroenterol Hepatol.* 2021;18(1):56-66.
9. Kimmel SE, Waddell LS, Michel KE. Hypomagnesemia and hypocalcemia associated with protein-losing enteropathy in Yorkshire terriers: Five Cases (1992-1998). *J Am Vet Med Assoc.* 2000;217(5):703-706. DOI: 10.2460/javma.2000.217.703
10. Ruaux CG, Steiner JM, Williams DA. Relationships between low serum cobalamin concentrations and methylmalonic acidemia in cats. *J Vet Intern Med.* 2009;23(3):472-475. DOI: 10.1111/j.1939-1676.2009.0308.x
11. Segarra S, Subiela MS, Cuellar CM, Puig MD, Prieto MA, Franco RF, *et al.* Oral chondroitin sulphate and prebiotics for the treatment of canine Inflammatory Bowel Disease: A randomized, controlled clinical trial. *BMC Vet Res.* 2016;12:49. DOI: 10.1186/s12917-016-0676-x
12. Suchodolski JS, Markel ME, Mazcorro GJF, Unterer S, Heilmann RM, Dowd SE, *et al.* The fecal microbiome in dogs with acute diarrhea and idiopathic inflammatory bowel disease. *PLOS One.* 2012;7(12):e51907. DOI: 10.1371/journal.pone.0051907