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Salil Kumar Pathak

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Amita Tiwari

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Amita Dubey

Department of Veterinary
Pathology, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Devendra Gupta

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Brejesh Singh

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Aditya Pratap

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Shivangi Sharma

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Rakesh Saindla

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Pooja Dawar

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Corresponding Author:

Salil Kumar Pathak

Department of Veterinary
Medicine, College of Veterinary
Science & A.H., NDVSU,
Jabalpur, Madhya Pradesh, India

Clinical abnormalities pertaining to renal disorders in canines

Salil Kumar Pathak, Amita Tiwari, Amita Dubey, Devendra Gupta, Brejesh Singh, Aditya Pratap, Shivangi Sharma, Rakesh Saindla and Pooja Dawar

Abstract

The present study was conducted to record the clinical abnormalities of dogs affected with renal disorders. For this study, a total of 2974 dogs presented at V.C.C., College of Veterinary Science and Animal Husbandry, Jabalpur, were screened from April-2022 to September-2022. Out of 2974 cases, 79 dogs were confirmed for renal disorders on the basis of clinical signs pertaining to renal disorders, renal function markers and nephrosonographic examination. Among these, 26 were having acute renal failure and 53 dogs were having chronic renal failure. The most prevalent clinical signs observed in renal disorders were inappetence/anorexia (100%), followed by vomiting (82.27%), weight loss (53.16%), poor oral health/halitosis (41.77%), haematuria (15.18%), polyuria (18.98%), polydipsia (18.98%), oligouria/anuria (11.39%), dribbling of urine (15.18%), ascites/odema (17.7%), malena/haematochezia (22.7%) and anaemia (53.16%). A total of 12 dogs (4 with ARF and 8 with CRF) having renal disorders.

Keywords: Renal disorders, acute renal failure, chronic renal failure, clinical signs

1. Introduction

Renal insufficiency is a clinical disorder characterized by alterations in homeostasis of water, electrolyte, acid-base, hormonal, haematological and cardiovascular functions. In recent years, renal failure is the third leading cause of death in young and older dogs. The incidence of renal disorders in dogs is up to 2-5%, in the form of renal failure viz. acute renal failure and chronic renal failure (Katoch *et al.*, 2018) [8].

The term renal disorders was used to denote the presence of renal lesions which is classified in dogs as acute renal failure (ARF) and chronic renal failure (CRF) depends upon the nature and onset of the disease. ARF is a clinical disease linked to the sudden onset of failure of hemodynamic, filtration and excretory mechanisms of the kidneys with subsequent accumulation of metabolic (uremic) toxins and dysregulation of fluid, electrolyte and acid balance (Cowgill and Elliott, 2000) [5]. Acute kidney injury represents a spectrum of acute diseases, encompassing a continuum of functional and parenchymal damage. The resultant renal injury will depend on the functional origin, severity and duration of the conditions inciting renal failure. Chronic renal failure (CRF) is characterized by the progressive and irreversible decline in a number of functional and structural nephrons (Bartges, 2012) [1] of one or both kidneys that have been present for an extended period, usually 3 months or longer. It may be characterized by a wide spectrum of diseases, ranging from a minor structural lesion in a single kidney to extensive loss of nephrons affecting both kidneys (Polzin, 2011) [16].

Early diagnosis is essential to stabilize renal function and prevent the rapid progression of the disease. Because of the differences in the diagnostic, therapeutic and prognostic implications, AKI and CKD must be diagnostically discriminated. Diagnosis is usually based on the combination of compatible history, physical examination, laboratory examination and imaging studies. However, it is very necessary to give prime attention to the clinical signs that are variedly appeared in different conditions of renal disorders.

2. Materials and Methods

For this study, a total of 2974 dogs presented at Veterinary Clinical Complex, College of Veterinary Science & A.H., Jabalpur (M.P.) were screened for a period of six months i.e. from April 2022 to September 2022. The dogs were screened for the presence of clinical symptoms viz. Inappetence, polydipsia, polyuria, anuria, malena, vomiting, ascites, halitosis, weight loss,

distended abdomen, oedema and duration of illness etc. Approximately 2 ml blood was collected in clot activator vials, aseptically from a cephalic vein or saphenous vein of dogs suspected for renal disorder. Serum was harvested after centrifugation, frozen and stored at -20 °C until further biochemical analysis.

Out of 2974 dogs, 79 dogs were found to be confirmed for the renal disorder. Confirmation was done on the basis of renal function markers i.e., creatinine (>1.4 mg/dl) and BUN (>27 mg/dl) and nephrosonography. After confirmatory diagnosis, these 79 cases were further classified as acute renal failure and chronic renal failure on the basis of the nature and duration of the illness.

3. Results and Discussion

3.1 Classification of renal disorder in affected dogs

A total of 79 dogs were affected with renal disorders and broadly classified into acute renal failure and chronic renal. Out of 79 affected dogs, 26 dogs were classified as having acute renal failure i.e. 32.91 per cent and 53 dogs were classified as having chronic renal failure i.e. 67.09 per cent. The maximum number of dogs were affected with chronic renal failure as compared to acute renal failure (Figure 01).

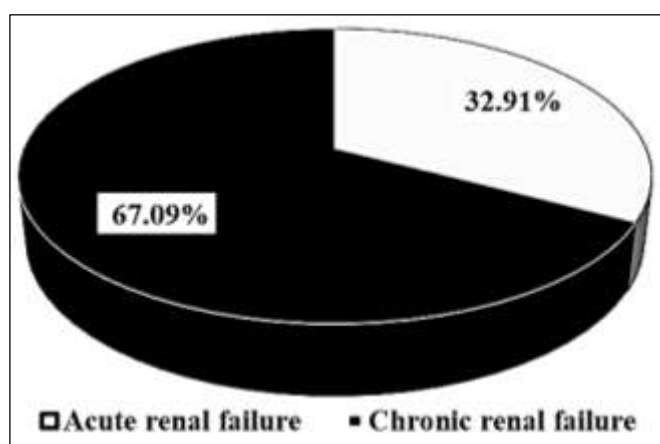


Fig 1: Distribution of renal disorders in dogs at VCC Jabalpur

Renal failure is a reversible and irreversible physio-pathological phenomenon. It is the most serious issue into the canine and around 2-5% of dogs suffer to these problems (Lund *et al.*, 1999) [11]. Renal failure classified into acute and chronic renal failure on the basis of clinical signs, duration of illness, haemato-biochemical parameters and urinary protein markers. The results of this study in accordance to Chaitanya *et al.* (2020) [3] who reported 18.24% dogs suffered with ARF where as 81.76% dogs were suffered with CRF. However, Tufani *et al.* (2015) [18] reported that i.e., acute renal failure was observed in 58% and chronic renal failure in 42% dogs. The occurrence of chronic renal failure was higher in the present work due to the progressive nature and ability of compensatory mechanism. The renal disease developed at any age of life which was diagnosed in later life of aged dogs as CRF. However, acute renal failure was due to sudden loss of nephron which can be under diagnosed and might be due to decreased blood flow to the kidneys, loss of filtering cells, impaired resorption processes in the nephrons, decrease in concentrating ability, morphological changes of nephrons and deprived immunity with the advancement of periods leads to CRF (Brown *et al.*, 2015) [12].

Diagnosis of renal failure is typically based on a consistent history, physical examination, laboratory data, and imaging studies, all of which play an important role in distinguishing acute from chronic renal failure. As a result, the initial diagnostic workup in acute renal failure in dogs is aimed at identifying the underlying cause, so that the latter can be eliminated and further kidney injury can be minimised to become a chronic condition (Tufani *et al.*, 2017) [19].

3.2 Clinical abnormalities of renal disorders in affected dogs

During the study of renal disorders in dogs, various clinical abnormalities were observed among the affected dogs. All the affected dogs have shown the signs of anorexia/inappetence followed by vomiting, weight loss, pale mucus membrane, poor oral health, Malena/haematochezia, polyuria, polydipsia, Ascites/odema, dribbling of urine, Haematuria and Oligouria/anuria (Table 02 and Figure 02).

Table 2: Clinical abnormalities in dogs with renal disorders at VCC, Jabalpur

Clinical abnormalities	ARF (n=26)	CRF (n= 53)	Total Frequency (n=79)
Anorexia/ inappetence	26 (100.00%)	53 (100.00%)	79 (100.00%)
Vomition	23 (88.46%)	42 (79.53%)	65 (82.27%)
Weight loss	04 (15.38%)	38 (71.69%)	42 (53.16%)
Pale mucus membrane	18 (69.23%)	24 (45.28%)	42 (53.16%)
Poor oral health/halitosis	01 (03.84%)	32 (60.37%)	33 (41.77%)
Malena/haematochezia	00 (00.00%)	18 (33.96%)	18 (22.7%)
Polyuria	03 (11.53%)	12 (22.64%)	15 (18.98%)
Polydipsia	03 (11.53%)	12 (22.64%)	15 (18.98%)
Ascites/odema	00 (00.00%)	14 (26.41%)	14 (17.7%)
Haematuria	08 (30.76%)	04 (07.54%)	12 (15.18%)
Dribbling of urine	08 (30.76%)	04 (07.54%)	12 (15.18%)
Oligouria/anuria	07 (26.92%)	02 (03.77%)	09 (11.39%)

The clinical abnormalities in renal disorders affected dogs in this study corroborate well with the findings of various scientists Chew *et al.* (2011) [4], Kumar *et al.* (2011) [9], O'Neill *et al.* (2013) [15], Mshelbwala *et al.* (2016) [13], Tufani *et al.* (2017) [18], Nakang *et al.* (2019) [14], Karunanithy *et al.* (2019) [7] and Subapriya *et al.* (2020) [17] who also reported varying clinical abnormalities viz. anorexia, inappetence, chronic vomiting, halitosis, oral ulcerations, melena,

diarrhoea, edema of hind limbs, urine abnormalities like polyurea, polydipsia, oliguria/anuria and progressive weight loss followed by weakness with variable physical activity.

The variable frequency of different clinical signs in renal disorders depends upon the degree of renal impairment, azotemia and health status of affected dogs. Deprived appetite and decreased feed intake may result in anorexia and weakness. vomiting may be due to the stimulation of the

medullary emetic chemoreceptor trigger zone by uraemic toxins which ultimately leads to gastroenteritis (Grauer, 2007) [6]. Weight loss and weakness may be outcomes of the presence of uremic catabolism and intestinal malabsorption (Liao *et al.*, 2012) [10]. Anaemia is seen due to renal damage which may lead to the deficiency of erythropoietin hormone and haemolysis of blood, produce haematuria that may occur

due to any infection. Polyuria and polydipsia may be a result of reduced medullary concentration ability and systemic hypertension (Bartges, 2012) [1]. Halitosis and poor oral health may result from vomiting and gastritis or cause by the effect of uraemic toxins, which altered the oral flora of the gastric mucosa and produce ammonia gas (Grauer, 2007; McGrotty, 2008) [6, 12].



Fig 2: Clinical signs in dogs affected with renal disorders (a) Pale mucosa (b) Edematous face (c) Ascites (d) Cachectic/ weight loss (e) Poor oral health (f) Haematochezia (g) Malena (h) Haematuria

4. Conclusions

Several modern techniques can be used to quickly diagnose renal failure, but due to the sophistications and complexities in the nephrosonographic examinations, urinalysis and biochemical estimations are making the process of diagnosis more difficult and time taking. Clinical manifestations of the disease are also crucial in diagnosing renal-affected dogs. There are several renal-specific syndromes that can be easily identified by clinicians and confirmed by advanced diagnostic tools, allowing renal patients to be managed. The most frequently observed clinical signs in dogs with renal disorders were anorexia/inappetence (100%) followed by vomiting (82.27%), weight loss (53.16%) and pale mucus membrane (53.16%).

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