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Original Research Paper

General Surgery

HYPONATREMIA AS A MARKER OF COMPLICATED APPENDICITIS

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KEYWORDS :

INTRODUCTION:

Appendicitis is the most common cause of acute surgical abdomen. Acute appendicitis severity ranges from mild inflammation to severe gangrene with perforation and local or widespread intraabdominal complication. Complicated appendicitis includes perforation of the appendix, empyema or abscess formation and finally fecal peritonitis. Appendiceal rupture is associated with increased risk of developing postoperative complications such as ileus, intra-abdominal abscess or wound infection as well as prolonged hospitalization. Thus, early preoperative identification and surgical intervention in patients with perforated appendicitis has important clinical implications. Several variables are used as diagnostic marker for complicated appendicitis. In the present study simple easily available low cost test serum sodium levels is used to diagnose the occurrence of complicated appendicitis.

Aim:

To study efficacy of preoperative hyponatremia in the prediction of complicated appendicitis.

Objectives:

1. To study serum sodium levels in patients who underwent appendicectomy.
2. To evaluate the occurrence of complicated and non complicated appendicitis.
3. To study association of preoperative hyponatremia with complicated appendicitis.

MATERIALS AND METHODS:

Study design : Retrospective cohort study
Study period : 11 months (January 2023 to November 2023)
Sample size : 50 patients
Source of the data : Patients who underwent appendicectomy in tertiary care hospital

Inclusion criteria:

1. All the patients who underwent appendicectomy during January 2023 to November 2023
2. Patient age between 15-60 yrs
3. All patients who were diagnosed clinically and histopathologically as acute appendicitis or appendicular perforation or gangrene were taken.

Exclusion Criteria:

1. Patients with missing history ,lab reports - preop serum sodium values, histopathological reports.
2. All patients with liver disease,chronic kidney disease, nephrotic syndrome.
3. All patients with SIADH.
4. Patients with hypothyroidism.

Methodology:

Retrospectively reviewed the medical files of all patients who satisfied selection criteria operated for acute appendicitis from January 2023 to June 2023. Patients case reports taken and case history, preop laboratory investigations, intraop findings and the histopathological report data were taken.Patients were classified into 2 groups: the complicated appendicitis group and the noncomplicated appendicitis group.Retrospectively reviewed the medical files of all patients who satisfied selection criteria operated for acute appendicitis from January 2023 to June 2023.Patients case reports taken and case history, preop laboratory investigations, intraop findings and the histopathological report data were taken.Patients were classified into 2 groups: the complicated appendicitis group and the noncomplicated appendicitis group.

RESULTS:

Out of 50 patients who underwent appendicectomy 34 (68%)had non complicated appendicitis and 16(32%) had complicated appendicitis.The mean serum sodium levels among all patients who underwent appendicectomy was 137.1mEq/l.Patients with complicated appendicitis had a mean sodium levels of 129.06 mEq/l which is lower compared to mean value of 140.88 mEq/l of noncomplicated appendicitis.The specificity of hyponatremia for complicated appendicitis was 85.29 % and sensitivity was 81.25%.

	Complicated appendicitis	Non complicated appendicitis
S.Na < 135 mg/dl	13	5
S.Na > 135 mg/dl	3	29
Total (50)	16	34

Positive predictive value is 72.2% and the Negative predictive value came out as 90.6%.The odds ratio is 25, signifies strong association between hyponatremia and complicated appendicitis.Chi square test is done and p value calculated which is 0.00001 indicating that the study is significant.

DISCUSSION:

Acute appendicitis is the most common cause of " acute abdomen" in young adults.Appendicectomy is the most frequently performed emergency abdominal operation.The peak incidence of acute appendicitis is in the second and third decade of life. Pathophysiological relationship between

hyponatremia and severe inflammation is not well understood.

Several studies have demonstrated that the development of hyponatremia in severe inflammation cases is a process which probably involves proinflammatory cytokines such as interleukin IL and IL-6 as well as antidiuretic hormone (ADH) secretion.Pro-inflammatory cytokines, including IL-6, are released by damaged and inflamed tissues. Circulating IL-6 is then either transported or diffuses across the blood-brain barrier. From here, it appears that IL-6 activates the subfornical organ and the organum vasculosum, resulting in thirst and also acting as a non-osmotic stimulus for release of antidiuretic hormone (ADH) from the supraoptic nucleus and paraventricular nucleus of the hypothalamus. ADH then acts upon the distal convoluted tubule and the collecting duct of nephrons within the kidney by inserting aquaporins.These aquaporins increase free water reabsorption, leading to a dilutional hyponatremia.

The present study demonstrated that preoperative hyponatremia was found more frequently in patients that proved to have complicated appendicitis than in those with non complicated appendicitis . Since complicated appendicitis is usually associated with unfavorable outcome, identification of preoperative hyponatremia, a low-cost, routine laboratory examination, could indicate increased possibility of appendiceal gangrene and/or perforation. This finding could potentially affect the course of patient management, leading to earlier operative intervention and abandonment of observational or nonoperative strategy.Considering that early detection of cases with CA would benefit from prompt surgical management, we investigated the relationship between the severity of acute appendicitis and the presence of preoperative hyponatremia.

CONCLUSION:

We conclude that there is a association between hyponatremia and complicated appendicitis.Hyponatremia is a better laboratory marker associated with complicated appendicitis in patients with clinical diagnosis of acute appendicitis.Therefore simple evaluation of serum sodium levels preoperatively helps in diagnosing complicated appendicitis.

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