



STUDY OF SERUM ELECTROLYTES IN ACUTE INTESTINAL OBSTRUCTION IN ADULT SOUTH KASHMIRI POPULATION.

Biochemistry

Dr. Nadeem Rashid Department of Surgery, Government Medical College, Anantnag.

Dr. Sadaf Ali* Department of Biochemistry, Government Medical College, Srinagar. *Corresponding Author

Dr. Bilal Ahmad Pahalwan Department of Surgery, Government Medical College, Anantnag.

ABSTRACT

This study was conducted in order to assess changes in levels of serum electrolytes in acute intestinal obstruction. This was an observational study carried out at GMC Anantnag from March 2019 to Jan 2020. For the purpose of this study 50 diagnosed cases of acute intestinal obstruction participated willingly. Serum electrolytes (sodium, potassium, chloride), levels of blood urea and bicarbonate were compiled. It was found that duration of intestinal obstruction did not affect potassium levels significantly and remained almost constant. However, the levels were relatively decreased around five days after onset of obstruction in some patients. Hypochloremia was observed in earlier stages of obstruction. Most of the patients developed acidosis and relative elevation of blood urea levels.

KEYWORDS

Blood urea, Electrolytes, Hypochloreaemia, Obstruction.

INTRODUCTION:

Acute intestinal obstruction is a surgical emergency commonly seen in surgical practice. It may be partial or complete obstruction of the bowel resulting in blockage of the passage of intestinal contents. Obstruction may take place either in small or large bowel.¹ Various common surgical conditions may lead to acid base disorders due to disturbances in the respiratory and metabolic components in our body. Therefore, frequent monitoring of serum electrolytes and other metabolic parameters like arterial blood gas analysis in these patients is indispensable in order to prevent further complications. Patients usually present with abdominal pain, vomiting, abdominal distension and constipation.^{2,3} Strangulation is one of the serious complications of acute intestinal obstruction that requires an emergency laparotomy. Bowel ischemia is another issue that significantly increases mortality rates associated with intestinal obstruction.⁵

Patients who underwent intestinal surgeries are at risk of fluid and electrolyte imbalance. Therefore, assessment of patients in post operative state is helpful to prevent complications such as electrolyte imbalance and fluid overload.⁶ There are changes in fluid and electrolytes in response to trauma and sepsis also.⁴ Fluid and electrolytes are important for homeostasis and allow maintenance of cardiovascular perfusion, normal functioning of organ system and other cellular mechanisms in response to surgical illnesses. Changes in the serum sodium levels affects functioning of body cells mainly because of water shifts between ECF and ICF. The most common investigation for diagnosing intestinal obstruction is a plain abdominal radiograph taken in erect posture. Patients with bowel obstruction require intravenous fluids and electrolytes. Some may require gastrointestinal aspiration and nasogastric tube along with broad spectrum antibiotics followed by appropriate surgery in order to rectify of the cause of intestinal obstruction.⁷

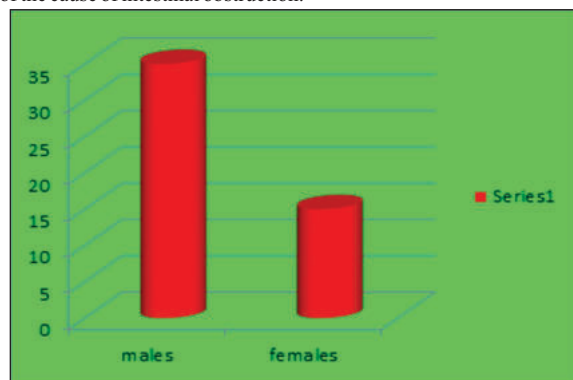


Fig.1: Distribution Of Cases Of Intestinal Obstruction Among Males And Females

MATERIALS AND METHODS:

For the purpose of this study a total of 50 patients participated and were diagnosed cases of acute intestinal obstruction admitted in the surgery ward in GMC Anantnag. The study was conducted from March 2019 to Jan 2020. Clinical history and demographic parameters were noted in each participant. Blood samples were taken with all aseptic precautions for routine investigations and the levels of serum electrolytes, bicarbonate and blood urea was measured in Biochemistry laboratory.

RESULTS AND DISCUSSION:

According to our study results, mean age of patients was 46 years; 70% were males and 30% were females. It was observed that bowel obstruction was more common in males as compared to females. The youngest patient was 32 years old and the oldest was 70 years of age.

Table 1: Causes Of Intestinal Obstruction In Our Study Population

Cause of intestinal obstruction	No. of cases	Percentage
Post operative Adhesions	20	40%
Inflammatory	16	32%
Strictures	10	20%
Malignancy	2	4%
External Hernia	2	4%

Table 2: Mean Serum Electrolytes, Bicarbonate And Blood Urea Levels (Day Wise) During Hospital Stay.

Laboratory parameters	Serum levels Day 1	Serum levels Day 3	Serum levels
Serum Sodium mEq/L	127	134	124
Serum Potassium mEq/L	4.1	4.5	4.0
Serum Chloride mEq/L	85	90	92
Bicarbonate levels mEq/L	19	20	22
Blood urea mg/dL	48	60	43

Individual serum sodium levels in this series ranged from 124 mEq/L to 134 mEq/L. Serum potassium ranged from 4.0 mEq/L to 4.5 mEq/L. Serum chloride ranged from 85 mEq/L to 92 mEq/L. Bicarbonate values in this series ranged from 19 to 22 mEq/L. In this series the mean values of urea ranged from 43 to 48 mg/dL.

Normal values: Sodium: 136-146 mEq/L, Potassium: 3.5-4.5 mEq/L, Chloride: 96-106 mEq/L, Blood Urea: 15-40 mg/dL

According to this study the most common cause of intestinal obstruction was postoperative adhesions. Patients presented with persistent hyponatremia. Although serum potassium levels remained relatively constant but hypokalemia was found around day 5 after onset of acute intestinal obstruction in some patients. Hypochloreaemic

acidosis was also present in these patients and this was also associated with increase in levels of blood urea persistently especially after day 3 of obstruction.

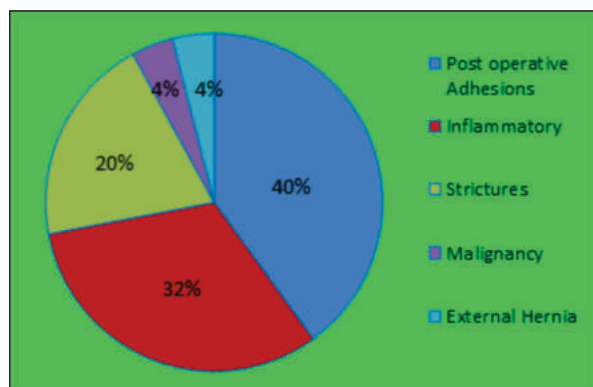


Fig.2: Causes Of Intestinal Obstruction In Our Study Participants

DISCUSSION:

This was an observational study in which 50 diagnosed cases of acute intestinal obstruction participated willingly. The patients were followed during their hospital stay and the levels of serum electrolytes, bicarbonate and blood urea levels were noted on day 1, day 3 and day 5 of their hospital stay. The underlying cause of obstruction was evaluated. In order to understand the patho-physiology of intestinal obstruction it is mandatory to correct fluid and electrolyte balance and deliver broad spectrum antibiotics to the patient and also to take appropriate decision for patients who require intensive care support and surgery to rectify the cause of obstruction.⁷

CONCLUSION:

This study concludes that patients of intestinal obstruction are at high risk of development of metabolic abnormalities and electrolyte imbalance. Therefore, it is essential to monitor these patients carefully and focus on management of fluid balance and electrolyte abnormalities symptomatically. In addition to this it is mandatory to prevent infections in these patients that may complicate the condition further. At the same time to identify the underlying cause and surgical correction at appropriate time if needed.

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