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STUDY ON EVALUATION OF SERUM ELECTROLYTES IN PATIENTS WITH ACUTE INSTESTINAL OBSTRUCTION

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ABSTRACT

Introduction: Acute intestinal obstruction occurs when there is an interruption in the forward flow of intestinal contents. This interruption can occur at any point along the length of the gastrointestinal tract, and clinical symptoms often vary based on the level of obstruction. Intestinal obstruction is most commonly caused by intra-abdominal adhesions, malignancy, or intestinal herniation. The mainstay of treatment in intestinal obstruction includes gastro duodenal suction, intravenous fluid administration and operative correction. This study was undertaken to identify the different electrolytic changes in adults with intestinal obstruction.

Objectives Of The Study: To measure serum electrolyte levels in patients with Acute Intestinal Obstruction.

Materials And Methods: Source Of Data And Study Design: A observational study was conducted at Dept. of Surgery, NC Medical College & Hospital, Israna (Dt), Panipat, Haryana from September 2019 to August 2020.

Results & Discussion: In our study, we evaluated serum sodium levels from day 1 to day 7 or more, we found the values ranging from 119.8 to 129.5 mEq/L in comparison to Eggleston series which ranged from 130.5 to 138.7 mEq/L. Further we evaluated serum potassium, chloride and urea levels, we found the values ranging from 3.8 to 5.2 mEq/L, 86.2 to 91.3 mEq/L and 42.1 to 68.8 mg/dL in comparison to Eggleston series which ranged from 4.03 to 4.45 mEq/L, 90.5 to 98.2 mEq/L and 60.9 to 120.1 mg/dL respectively.

Conclusion: We noted persistent hyponatremia, remarkably constant serum potassium, low chloride levels and elevated blood urea levels. There was improvement in mortality and morbidity rates due to early diagnosis and treatment despite presenting late to the hospital. Dehydration, electrolyte changes and septicaemia are the important causes of death.

KEYWORDS : Acute Intestinal Obstruction, Sodium, Potassium, Chloride and Dehydration

INTRODUCTION:

Acute intestinal obstruction occurs when there is an interruption in the forward flow of intestinal contents. This interruption can occur at any point along the length of the gastrointestinal tract, and clinical symptoms often vary based on the level of obstruction. Intestinal obstruction is most commonly caused by intra-abdominal adhesions, malignancy, or intestinal herniation. The clinical presentation generally includes nausea and emesis, colicky abdominal pain, and a failure to pass flatus or bowel movements. The classic physical examination findings of abdominal distension, tympani to percussion, and high-pitched bowel sounds suggest the diagnosis. Radiologic imaging can confirm the diagnosis, and can also serve as useful adjunctive investigations when the diagnosis is less certain. Although radiography is often the initial study, non-contrast computed tomography is recommended if the index of suspicion is high or if suspicion persists despite negative radiography. Management of uncomplicated obstructions includes fluid resuscitation with correction of metabolic derangements, intestinal decompression, and bowel rest. Evidence of vascular compromise or perforation, or failure to resolve with adequate bowel decompression is an indication for surgical intervention. Electrolytes are salts in the body that conduct electricity and are found in the body fluid, tissue and blood. Examples are chloride, calcium, magnesium, sodium and potassium. Na+ is concentrated in ECF and K+ is concentrated in ICF. Proper balance is essential for muscle co-ordination, heart function, fluid absorption and excretion and nerve function. Bowel obstruction describes the failure of progression of intestinal contents. Based on nature, severity, location and etiology several terms are used to describe bowel obstruction e.g. functional, mechanical etc. Simple mechanical obstruction is the compromise of lumen of bowel without compromise of its vascular supply. In simple obstruction, important and progressive changes take place in the bacteriologic content of obstructed bowel, in the amount and composition of gas in the gut above obstruction, in circulation in the distended bowel and in the complex fluid and electrolyte fluxes that takes place across it. When strangulation complicates the picture, these pathological changes are compounded by the progressive vascular changes in the affected intestine and its mesentery and eventually leads to toxaemia associated with actual death of gut wall.

Eggleston et al in his study, noted that there is a persistent hyponatremia, a gradual drop in serum sodium levels beginning 5 days after onset of obstruction, a progressive decrease in chloride level over first week followed by a rise in urea level for a week and an initial tendency towards acidosis gradually replaced by alkalosis. The mainstay of treatment in intestinal obstruction includes gastro duodenal suction, intravenous fluid administration and operative correction.

OBJECTIVE OF THE STUDY:

To measure serum electrolyte levels in patients with Acute Intestinal Obstruction.

MATERIALS AND METHODS:

Source of data and Study design: A observational study was conducted at Dept. of Surgery, NC Medical College & Hospital, Israna (Dt), Panipat, Haryana from September 2019 to August 2020.

Inclusion Criteria:

Only acute cases treated surgically and diagnosis of obstruction proved at the time of operation were included in the study.

Exclusion Criteria:

Patients with external hernia in which only omentum was found & Patient with adynamic or post-operative ileus were excluded.

RESULTS:

There were total of 32 patients who were diagnosed with acute intestinal obstruction out of 540 patients who were admitted in the surgical ward during this period. The various causes for Intestinal Obstruction include: Adhesions (Postoperative, Inflammatory, Congenital band), External Hernia, Strictures, Malignancy, Intussusception & Internal Hernia. Sodium, potassium, chloride and urea levels were measured in all these patients on daily basis from day 1 to 7 days of admission, the results are shown in table 1, 2,3 & 4 respectively.

Table 1: Shows The Sodium Levels On Daily Basis

Duration	Present Series	Eggleston Series
1	129.3	131.6
2	132.4	135.7
3	128.8	132.7
4	125.3	130.6
5	121	134.9
6	119.8	130.5
7 days or more	129.5	138.9

Table 2: Shows The Potassium Levels On Daily Basis

Duration	Present Series	Eggleston Series
1	4.3	4.39

2	4.12	4.28
3	5.2	4.45
4	4.7	4.32
5	4.3	4.29
6	4.81	4.18
7 days or more	3.8	4.03

Table 3: Shows The Chloride Levels On Daily Basis

Duration	Present Series	Eggleston Series
1	86.7	98.2
2	88	98
3	86.2	95.5
4	90.2	90.5
5	91.3	91.2
6	88	90.2
7 days or more	90	97

Table 4: Shows Blood Urea Levels On Daily Basis

Duration	Present Series	Eggleston Series
1	51.3	73.8
2	42.1	60.9
3	35.2	93.9
4	57.3	103.5
5	68.8	100.1
6	43.7	120.1
7 days or more	51.7	69.4

DISCUSSION:

We included a total of 32 patients who were admitted for acute intestinal obstruction in our study. Most of the patients has presented between 2nd and 4th day. The longest duration of the presentation was 12 days. The prognosis of intestinal obstruction was considerably improved when the extent of associated water and electrolyte loss and need for intravenous replacement were recognized.

We had undertaken this study to highlight the importance of knowing and correcting the fluid and electrolyte imbalance in patients with intestinal obstruction. In our study, we evaluated serum sodium levels from day 1 to day 7 or more, we found the values ranging from 119.8 to 129.5 mEq/L in comparison to Eggleston series which ranged from 130.5 to 138.7 mEq/L. Further we evaluated serum potassium, chloride and urea levels, we found the values ranging from 3.8 to 5.2 mEq/L, 86.2 to 91.3 mEq/L and 42.1 to 68.8 mg/dL in comparison to Eggleston series which ranged from 4.03 to 4.45 mEq/L, 90.5 to 98.2 mEq/L and 60.9 to 120.1 mg/dL respectively. Our study showed the following features, persistent hyponatremia but with no relation to duration of obstruction, serum potassium levels remained remarkably constant, chloride levels were low and showed elevated blood urea levels especially after 3 days of obstruction. In comparison to Egglestone series, which showed persistent hyponatremia, a gradual drop in serum potassium level beginning 5 days after onset of obstruction and a progressive decrease in serum chloride levels over the first week followed by a rise.

CONCLUSION:

We studied 32 patients presented with acute intestinal obstruction out of 540 patients admitted to the surgical ward. We noted persistent hyponatremia, remarkably constant serum potassium, low chloride levels and elevated blood urea levels. There was improvement in mortality and morbidity rates due to early diagnosis and treatment despite presenting late to the hospital. Dehydration, electrolyte changes and septicaemia are the important causes of death. Better prognosis is attributed to better anaesthetic techniques, better knowledge of fluid and electrolyte replacement, efficient blood transfusion services and introduction of antibiotics and gastro duodenal suction.

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