

To Study Serum Electrolyte Levels in Patients with Irritable Bowel Syndrome: An Institutional Based Study

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Abstract

Background: Irritable bowel syndrome is a gastrointestinal condition that normally has an altered bowel habits in addition to abdominal discomfort without the presence of any detectable structural and biochemical alterations. Few studies have found that statistically significant betterment in abdominal pain is seen amongst the clinical trials with electrolyte supplements were provided. The present study was conducted with the aim to determine the serum electrolytes level amongst patients with irritable bowel syndrome. **Materials and Methods:** The present observational case-control study was performed in the Department including 108 subjects between the age group of 25–60 years of age amongst them 50% were cases and 50% were controls. Blood was made to clot and serum was separated at 5000 rpm for 10 minutes and estimated for the level of potassium, chloride and sodium using direct electrolyte analyser. All the data thus obtained was arranged in tabulated form and analysed using SPSS software. Student t test was used for statistical analysis and p value of less than 0.05 was considered as significant. **Results:** Amongst males, there were 21 cases and 30 controls. There were 33 females amongst cases and 24 controls. The sodium level amongst the cases was 138.21 ± 3.14 mEq/L and amongst the controls were 139.31 ± 3.77 mEq/L. There was no significant difference amongst the cases and controls. **Conclusion:** The present study showed no significant difference in the electrolyte levels amongst the cases and controls. Studies need to be conducted with larger sample size to study the significance of dyselectrolytemia.

Keywords: Dyselectrolytemia, Potassium, Sodium, Chloride

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Introduction

Irritable bowel syndrome is a gastrointestinal condition that normally has an altered bowel habits in addition to abdominal discomfort without the presence of any detectable structural and biochemical alterations[1]. It is one of the most common, multifactorial, complex and heterogeneous disease that effects around 1 in 5 people during their lifetime. It also carries a significant medical and socioeconomic effect that reduces quality of life of subject and it also carries a significant burden to the healthcare status of a country[2]. The etiopathology is poorly understood and various factors are involved in the causation. Understanding its pathogenesis is crucial as today's newer drug agents are starting to target the known pathophysiologic alterations in irritable bowel syndrome[3]. The diagnosis and treatment of this condition could be challenging. Various pathogenic factors have been found responsible like genetic and environmental reasons, alterations in digestive responses, hypersensitivity of viscera, inflammatory and post-infectious conditions, psychological factors, and bacterial overgrowth amongst others. Whereas, not any of it has clearly explained the real method that trigger this syndrome[4]. Subjects diagnosed with this condition have "lower-grade of

intestinal inflammatory responses", and elevated intestinal with alters the intestinal microbiota[5]. Present studies with respect to irritable bowel syndrome have found controversial results in the level of serum electrolyte. Few studies have found that statistically significant betterment in abdominal pain is seen amongst the clinical trials with electrolyte supplements were provided[6]. The present study was conducted with the aim to determine the serum electrolytes level amongst patients with irritable bowel syndrome.

Materials and Methods

The present Observational case-control study was performed in the Department of Biochemistry, Teerthanker Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh (India) including 108 subjects between the age group of 25–60 years of age amongst them 50% were cases and 50% were controls. All the subjects were informed about the study and a written consent was obtained from them in their vernacular language. Subjects with pain of discomfort in abdomen for more than 3 days a month in the last three months were included in the study. Subjects with known cause of diarrhoea or any anatomical evidence were excluded from the study. Subjects with any associated co morbidities like diabetes, hypertension etc were also not included. Patients on medications that alter the level of sodium, chloride or potassium were excluded from the study. In a pre-designed proforma, a detailed personal history of the subjects was obtained along with their symptoms, duration of disease, chief complaint etc. Under complete aseptic condition, 5 ml of venous blood was withdrawn. Blood was made to clot and serum was separated at 5000 rpm for 10 minutes and estimated for the level of

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potassium, chloride and sodium using direct electrolyte analyser. All the data thus obtained was arranged in tabulated form and analysed

using SPSS software. Student t test was used for statistical analysis and p value of less than 005 was considered as significant.

Table 1: Age distribution amongst the subjects

Age (years)	Cases (frequency)	Controls (frequency)
<30	18	22
31-40	16	8
41-50	13	7
51-60	7	17

Table 2: Gender distribution amongst the subjects

Gender	Cases (frequency)	Controls (frequency)
Male	21	30
Female	33	24

Table 3: Electrolytes level amongst cases and controls

Serum electrolytes	Cases	Controls	P value
Sodium (mEq/L)	138.21 ± 3.14	139.31 ± 3.77	0.15
Potassium (mEq/L)	4.18 ± 0.23	4.25 ± 0.35	0.20
Chloride (mEq/L)	103.40 ± 5.21	101.09 ± 7.89	0.01

Results

Table 1 shows the age distribution amongst the subjects. There were 18 cases and 22 controls that were less than 30 years of age. There were 16 cases and 8 controls between 31-40 years of age. There were 13 cases and 7 controls between 41-50 years of age. There were 7 cases and 17 controls between 51-60 years of age.

Table 2 shows the gender distribution of the subjects amongst the study. Amongst males, there were 21 cases and 30 controls. There were 33 females amongst cases and 24 controls.

Table 3 shows the electrolytes level amongst cases and controls. The sodium level amongst the cases was 138.21 ± 3.14 mEq/L and amongst the controls were 139.31 ± 3.77 mEq/L. There was no significant difference amongst the cases and controls. The potassium level amongst the cases was 4.18 ± 0.23 mEq/L and amongst the controls were 4.25 ± 0.35 mEq/L. There was no significant difference amongst the cases and controls. The chloride level amongst the cases was 103.40 ± 5.21 mEq/L and amongst the controls were 101.09 ± 7.89 mEq/L. There was a significant difference amongst the cases and controls.

Discussion

The etiopathogenesis of irritable bowel syndrome has seen a rapid evolution along with scientific improvements, but it was reported and recognized around 150 years ago. In the year 1849, Cumming wrote that, "The bowels are at a certain time constipated, and at another lax, in the person affected with IBS. How can the disease have two different clinical presentations I fail to explain"[7]. Irritable Bowel syndrome is a usual bowel disease that produces a considerable health care economic burden and can drastically impair life's quality and is the frequently diagnosed gastrointestinal disease. The etiology is fairly understood and many different factors are involved. Understanding of the etiopathogenesis of bowel syndrome is crucial as today's newer drugs are starting to target some known pathophysiologic reasons of bowel syndrome. Impaired GI motility, post infectious reactivity, visceral hypersensitivity, brain-intestine interactions, change in fecal micro flora, overgrowth of bacteria, sensitivity of food, malabsorption of carbohydrate and inflammation of intestine all have been found in the pathogenesis of the condition[3]. However, the commonly observed symptoms from these systems consist of pain or discomfort in abdomen, diarrhea, bloating and constipation. Not all symptoms are related to GI system, for example, fatigue is very frequent amongst those. Medical treatment has focused on symptomatic management of the individual symptoms. Serotonin is primarily seen in the enterochromaffin cells of the gut and is a prime regulator of the peristaltic reflex mechanism and sensory relays amongst the gut[8]. There are two types of

evidence that support the view that serotonin levels are abnormal in the disease[9]. In the present study, the sodium level amongst the cases was 138.21 ± 3.14 mEq/L and amongst the controls were 139.31 ± 3.77 mEq/L. There was no significant difference amongst the cases and controls. The potassium level amongst the cases was 4.18 ± 0.23 mEq/L and amongst the controls were 4.25 ± 0.35 mEq/L. There was no significant difference amongst the cases and controls. The chloride level amongst the cases was 103.40 ± 5.21 mEq/L and amongst the controls were 101.09 ± 7.89 mEq/L. There was a significant difference amongst the cases and controls. Available surveys related to irritable bowel syndrome have found controversial reports amongst the serum electrolyte levels. Some researchers have found a statistically significant improvement in the discomfort or pain of abdomen when clinical studies with electrolyte supplementation were provided to subjects[10]. Although diarrhea is the commonest bowel dysfunction amongst one-third of subjects with the disease, it is not clear whether it is a specific condition of intestinal fluid or electrolyte dysfunction in the syndrome, as there is no established evidence since now[11]. Diarrhea in the disease is normally regarded secondary to the accelerated colon transit and decreased volume of proximal colon[12]. The functional disease is normally related with considerable emotional distress, impairment in health-associated quality of life, disability and high costs of health care[13].

Conclusion

Although, no single aetiology of irritable bowel syndrome has been pin pointed, several mechanisms have been contributed to the intestinal secretion. The present study showed no significant difference in the electrolyte levels amongst the cases and controls. Studies need to be conducted with larger sample size to study the significance of dyselectrolytemia.

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