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Epidemiology of Recurrent Abdominal Pain among Bangladeshi Adolescents

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Abstract
Introduction: *The recurrent abdominal pain has become a common disease specially among the adolescents in Bangladesh. A study in Bangladesh reported that about 11.5% adolescent aged 9-15 years are the sufferer of recurrent abdominal pain and in Sri Lanka it was 10.5%. In developed countries about 10-12% of school going adolescents had recurrent abdominal pain. Most of the studies found that, in comparison with the boys, girls are more affected****Objectives:*** *The aim of this study was to assess the relationship between the demographic characteristics of recurrent abdominal pain with other factors.****Materials and Methodology:****This study is a prospective cross-sectional study was conducted in a department of pediatrics in Enam Medical College Hospital. The study period was from 24th October 2019 to 1st August 2021. In this study, sample size required was 40. The inclusion criteria in this study were the adolescents who were aged between 11-18 years and had been suffering from recurrent abdominal pain. The exclusion criteria were students who did not answer or fill in the data completely and clearly on the questionnaire and could not be reached to clarify the incomplete or unclear data.* ***Result:*** *the age group 11-13 had the highest the prevalence of recurrent abdominal pain. 48.33% had deffuse abdominal pain, 21.67% had pain in periumbilical area, 6.67% had in Pelbic, 5% had in epigastric, 5% had in left flank, 5% had in right iliac fossa, 3.33% had in right flank, 1.67% had in left iliac fossa, 1.67% had in left hypochondrium, 1.67% had in right hypochondrium.* ***Conclusion:*** *The recurrent abdominal pain has become a common problem among the adolescents. The health professionals, the parents of the adolescents, the schools and the health authorities should take necessary steps regarding this matter.*
Key words: *Recurrent abdominal pain; etiology; localization; abdominal ultrasounds.*

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I. Introduction

The recurrent abdominal pain has become a common disease specially among the adolescents in Bangladesh.[1] The recurrent abdominal pain can be defined as "at least three episodes of abdominal pain, severe enough to affect their activities over a period longer than three months".[2]This is the pain which occurs between the chest and pelvic regions. This pain most commonly can be crampy, achy, dull, intermittent or sharp. It's also called a stomachache. Intestines (small and large), kidneys, appendicitis (a part of the large intestine), spleen, stomach, gallbladder, liver, pancreas are the major organs located in the abdomen area.[3-5] Some studies show the prevalence of recurrent abdominal pain varies by age and gender, genetic reason, life-style, food habit, other diseases, mental stress among adolescents, parents educational level etc.[3-5]A study in Bangladesh reported that about 11.5% adolescent aged 9-15 years are the sufferer of recurrent abdominal pain and in Sri Lanka it was 10.5%.[4-6] The recent studies in Malaysia on the prevalence of abdominal pain showed in rural area 10.2% adolescents aged 11-16 years were the sufferer and in urban area it was 9.6% among the adolescents aged 9-15.4,5.[7,8]In developed countries about 10-12% of school goer adolescents had recurrent abdominal pain.[3,4]Most of the studies found that, in comparison with the boys, girls are more affected.[9]The exact factors of recurrent abdominal pain among the adolescents are hard to find. Though different studies are trying to find the exact cause and mechanism of recurrent abdominal pain among the adolescents but the results are not sufficient

enough to claiming the exact causes.[9]In this study several hypotheses made to explain the occurrence of recurrent abdominal pain, including visceral hyperalgesia, dysmotility, interaction of the 'brain-gut', inflammation, immunity, genetics, stress conditions, and biopsychosocial.[7-9]In a study it is found that, the major causes of severe abdominal pain include:organ rupture or near-rupture (such as a burst appendix, or appendicitis, gallbladderstones (known as gallstones), kidneystones, kidney infection.[5,9]

II. Objective

The objective of this study was to found the association between the demographic characteristics with recurrent abdominal pain, localization of abdominal pain, signs of accompanying abdominal pain, results of abdominal ultrasounds and etiologies of intense abdominal pain.

III. Materials & Methodology

This study is a prospective cross-sectional study was conducted in a Department of Pediatrics in Enam Medical College Hospital. The study period was from 24th October 2019 to 1st August 2021. In this study, sample size required was 40 and they were school goers and were selected randomly, while the subjects were recruited in consecutive sampling method. The inclusion criteria in this study were the adolescents who were aged between 11-18 years and had been suffering from recurrent abdominal pain.The exclusion criteria were students who did not answer or fill in the data completely and clearly on the questionnaire and could not be reached to clarify the incomplete or unclear data. All the data were collected from the semi-structured questionnaire and the medical history were collected from the record of the medical reports. A detailed history about presenting complaints, signs, and demographic characteristics, personal and family history were recorded carefully. Surgical and other specialist consultation was taken from the appropriate consultant whenever it was required. The data were analyzed using the SPSS software version 24 and MS Excel-2016.

IV. Results

The table I shows the distribution of the study people in accordance with sociodemographic characteristics. The sample size (N) was 40. Here among the 40 participants the age group of study people shows that the age group 11-13 had the highest participation of 38.33%. The participation of age group 13-15 was 30%, 15-17 was 20% and 17-18 was 11.67%. The majority of the study people were girls 56.67% and the boys were 43.33%. Among the 40 participants, 61.67% were the urban dwellers and 38.33% were from the rural areas. Assessing the father's educational level it was found that 63.33% of them had graduated, 26.67% had secondary level education and 10% of them had primary educational background. On the other hand, assessing the mother's educational qualification, it was found that 51.67% of them had graduated, 35% had secondary education and 13.33%) of them were from primary educational background. The family income of 13.33%) was less than 10000, 36.67% had 10000-20000, 38.33%) had 20000-30000 and 11.67% had more than 30000. Figure I shows the localization of abdominal pain. 29(48.33%) had deffuse abdominal pain, 13(21.67%) had pain in periumbilical area, 4 (6.67%) had in Pelvic, 3(5%) had in epigastric, 3(5%) had in left flank, 3(5%) had in right iliac fossa, 2(3.33%) had in right flank, 1(1.67%) had in left iliac fossa, 1(1.67%) had in left hypochondrium, 1(1.67%) had in right hypochondrium. Table -II shows the signs of abdominal pain. 15(25%) had fever, 21(35%) had vomiting, 19(31.67%) had diarrhea, 9(15%) had general alteration, 7(11.67%) had constipation, 5(8.33%) had abdominal distension, 3(5%) had rhinorrhea, 2(3.33%) had cough, 2(3.33%) had headache, 2(3.33%) had hematuria, 2(3.33%) had dysuria, 2(3.33%) had had polyarthralgias, 2(3.33%) had others sign and 2(3.33%) had had no sign. Here the table III shows the results of the abdominal ultrasound and the frequencies of abnormalities found in the abdominal ultrasound. In 17(28.33%) cases had adentis, in 9(15%) cases had hepatomegaly, in 8(13.33%) had intestinal abnormalities, in 4(6.67%) cases had ascites, in 3(5%) had splenomegaly, in 2(3.33%) had gallbladdler abnormalities, in 1(1.67%) had appenditis, and 12(20%) cases were found normal. This table represents the etiologies of intense abdominal pain. Under etiologies, 18(30%) had bacterial infection and under this there were some pathological cases. 27(45%) had acute pyelonephritis, 14(23.33%) had pneumonia, 1(1.67%) had pleuropneumonia, 6(10%) had acute hepatic abscess, 6(10%) had acute bacterial gastroenteritis, 6(10%) and had acute cholecystitis. In 16(26.67%) cases had parasitic and under this 49.32(82.20%) had malaria, 4(6.67%) had intestinal ameobiasis, 4(6.67%) had chronic bilharzia, 2(3.33%) had ascariasis. 6(10%) cases had viral infections and under this, 30(50%) had gastroenteritis (rota virus), 18(30%) had viral disease, 12(20%) had hepatitis B. 4(6.67%) cases had surgical history and under this 34(56.67%) had appendix surgery, 9(15%) had chronic Hirschsprung's disease, 9(15%) had intestinal occlusion, 9(15%) had chronic hydro- salpingite. 4(6.67%) had constipation and 23(38.33%) had acute and 37(61.67%) had chronic constipation. 3(5%) had vaso occlusive crisis and under this 30(50%) had acute and 30(50%) had chronic. Under other 3(5%) cases, 20(33.33%) had chronic gastric ulcer, 10(16.67%) had still's disease, 10(16.67%) had rental disease, 10(16.67%) had nephritic colic, 10(16.67%) had chronic dysmenorrhea. And 4(6.67%) cases were unknown and among these 51(85%) were chronic cases.

Table-I: Demographic Characteristics of the study people (N=40)

Demographic Characteristics		N	%
Age	11-13	16	38.33
	13-15	12	30.00
	15-17	8	20.00
	17-18	4	11.67
Gender	Female	23	56.67
	Male	17	43.33
Residential	Urban	25	61.67
	Rural	15	38.33
Father Educational level	Primary	4	10.00
	Secondary	11	26.67
	Graduate	25	63.33
Mother Educational level	Primary	5	13.33
	Secondary	14	35.00
	Graduate	21	51.67
Family Income	<10000	5	13.33
	10000-20000	15	36.67
	20000-30000	15	38.33
	>30000	5	11.67

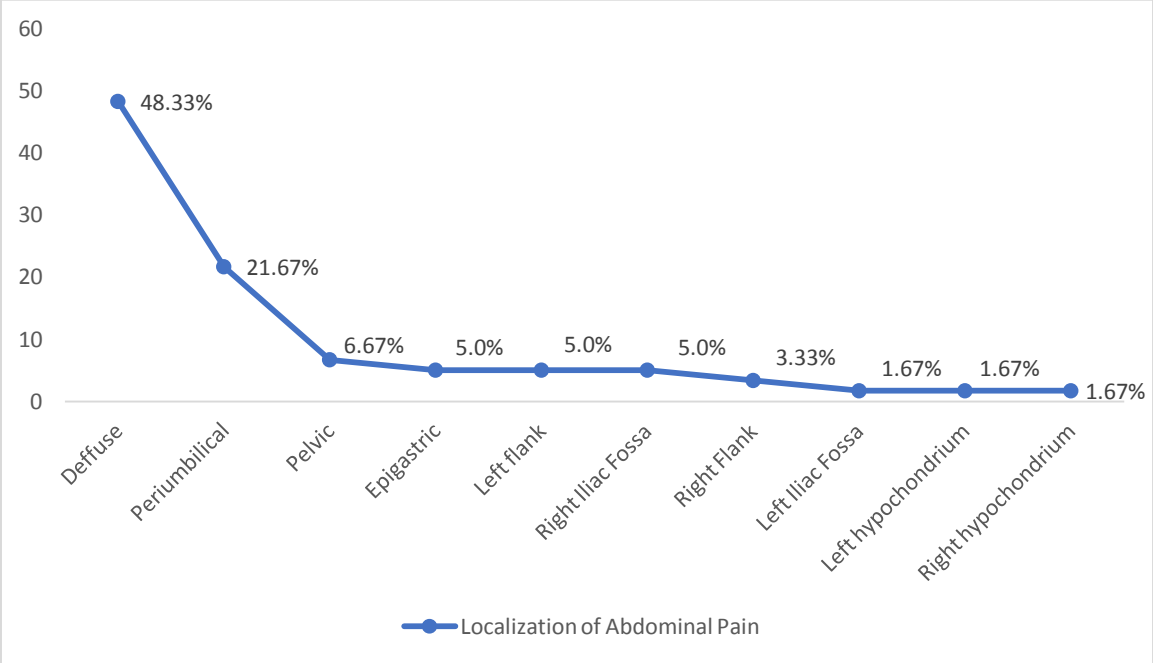

Figure-I: Localization of Abdominal Pain (N=40)

Table-II: Signs Accompanying Abdominal Pain (N=40)

Signs Accompanying Abdominal Pain	N	Percentage
Fever	10	25.00
Vomiting	14	35.00
Diarrhea	13	31.67
General Altaration	6	15.00
Constipation	5	11.67
Abdominal Distension	3	8.33
Rhinorrhea	2	5.00
Cough	1	3.33
Headache	1	3.33
Hematuria	1	3.33
Dysuria	1	3.33
Polyarthralgias	1	3.33
Others	1	3.33
No Sign	1	3.33

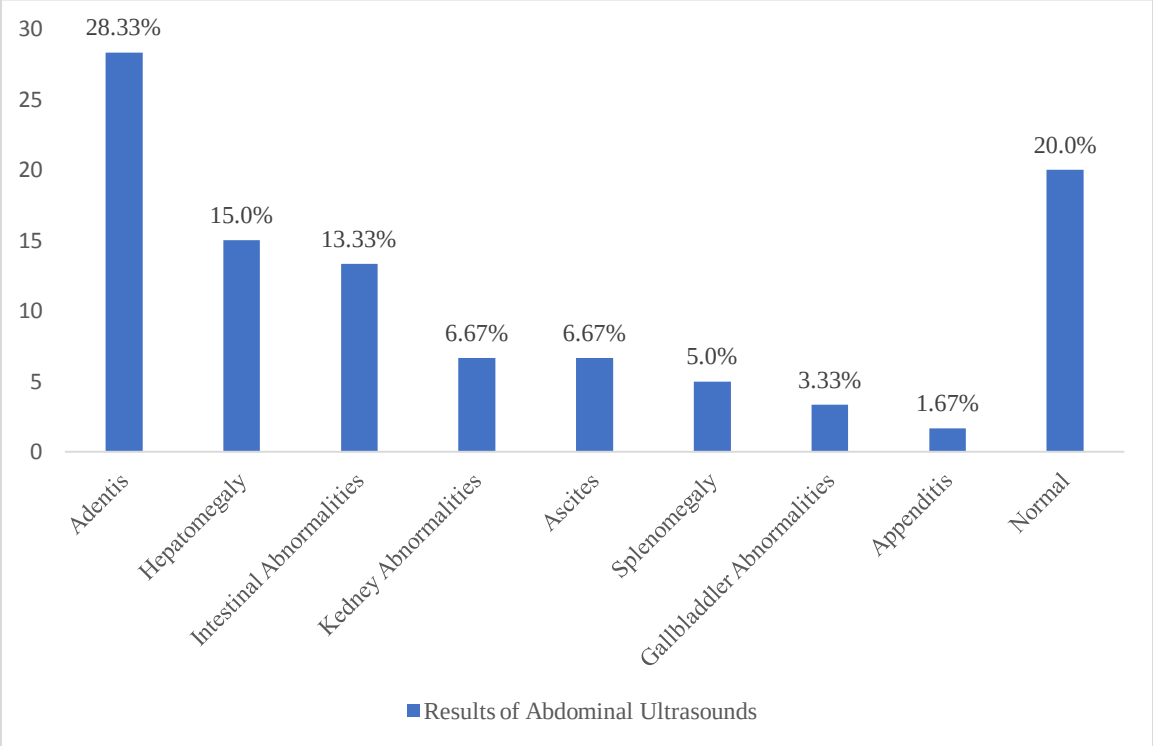

Figure II: Results of Abdominal Ultrasound

Table-III: Etiologies of Intense Abdominal Pain (N=40)

Etiologies		Acute Pains		Chronic Pains	
	Pathologies	N	%	N	%
Bacterial 18 (30%)	Pyelonephritis	18	45.00		
	Pneumonia	9	23.33		
	Pleuropneumonia	1	2.5		
	Bacterial gastroenteritis	4	10.00		
	Acute cholecystitis	4	10.00		
Parasitic 16 (26.67%)	Intestinal amoebiasis	4	6.67		
	Ascariasis			2	3.33
Viral Infections 6 (10%)	Gastroenteritis	30	50.00		
Surgical 4(6.67%)	Appendix	2	5.0		
Constipation 4(6.67%)		15	38.33	24	61.67
Other 3(5%)	Gastric ulcer			13	33.33
	Dysmenorrhea			1	16.67

V. Discussion

In this study the age group 11-13 had the highest the prevalence of recurrent abdominal pain and it was 38.33% and the age group 17-18 had the lowest participant of 11.67%. This prevalence is higher than the prevalence of recurrent abdominal pain in school-age children who are mostly adolescent in developed countries which are 10-12%.[10,11] Some similar epidemiological studies which was conducted in some developed countries in Asia showed similar results. A recent study conducted in Bangladesh in children aged 7-15 years where the prevalence was 11.5%, in comparison to the prevalence in Sri Lanka in children aged 5-15 years which was 10.5%.[3,4,6]. Another study Malaysia on age group 11-16 years resulted prevalence of 10.2% (rural) and age group 9-15 years was 9.6% (urban).[7,8] In this study, among the 40 participants, 48.33% had deffuse abdominal pain, 21.67% had pain in periumbilical area, 6.67% had in Pelbic, 5% had in epigastric, 5% had in left flank, 5% had in right iliac fossa, 3.33% had in right flank, 1.67% had in left iliac fossa, 1.67% had in left hypochondrium, 1.67% had in right hypochondrium. In this study, girls were more sufferer of recurrent abdominal pain (56.67%) than boys (43.33%). Similar result was found in a study conducted in Australia, where girls experienced more recurrent abdominal pain (52%) than boys (35%).[12] In this study, there were many signs of recurrent abdominal pain like 25% had fever, 35% had vomiting, 31.67% had diarrhea, 15% had general alteration, 11.67% had constipation, 8.33% had abdominal distantion, 5% had rhinorrhea, 3.33% had cough, 3.33% had headache, 3.33% had hematuria, 3.33% had dysuria, 3.33% had had polyarthralgias, 3.33% had others sign and 3.33% had

had no sign. Analyzing these sign it can be assumed that vomiting was the most common sing among these all. Under the abdominal ultrasound and the frequencies of abnormalities it was found that in 28.33% cases had adentis, in 15% cases had hepatomegaly, in 13.33% had intestinal abnormalities, in 6.67% cases had ascites, in 5% had splenomegaly, in 3.33% had gallbladdler abnormalities, in 1.67% had appenditis, and 20% cases were found normal Under etiologies, 30% had bacterial infection and under this there were some pathological cases. 45% had acute pyelonephritis, 23.33% had pneumonia, 1.67% had pleuropneumonia, 10% had acute hepatic abscess, 10% had acute bacterial gastroenteritis, 10% and had acute cholecystitis. In 26.67%cases had parasitic and under this 82.20% had malaria, 6.67% had intestinal ameobiasis, 6.67% had chronic bilharzia, 3.33% had ascariasis. 10% cases had viral infections and under this, 50% had gastroenteritis rota virus, 30% had viral disease, 20% had hepatitis B.6.67% cases had surgical history and under this 56.67% had appendix surgery,15% had chronic Hirschsprung's disease, 15% had intestinal occlusion, 15% had chronic hydro- salpingite.6.67% had constipation and 38.33% had acute and 61.67% had chronic constipation. 5% had vaso occlusive crisis and under this 50% had acute and 50% had chronic. Under other 5% cases, 33.33% had chronic gastric ulcer, 16.67% had still's disease, In a study byFrank at al. of age group 3 to 15 years old with recurrent abdominal pain and 48% had H. pylori, 52% had diffuse abdominal pain, and 14% vomiting.[13] However, the discussion above shows the severity of recurrent abdominal pain among the adolescents.[14] This is high time, we should come forward to overcome the situation.

Limitation of the study:

There were some limitations in this study. The exact cause of recurrent abdominal pain was not found clearly, limited study people, no sign found in 3.33% cases. Although this study has some limitations, the results are expected to provide an overview of the prevalence, localizations, signs, and etiologiesfor recurrent abdominal pain in adolescents with similar demographic characteristics.

VI. Conclusion

To conclude it can be said that, recurrent abdominal pain has become a common problem among the adolescents. Studies had also proved the severity of recurrent abdominal pain. So, the health professionals should give advice regarding this issue. Besides, the parents of the adolescents should also be more conscious. Schools can play a vital role here by arranging seminars and awareness program regarding this issue.

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