



Observational study of incidence and clinical patterns of Mesenteric lymphadenopathy among children in RVM hospital

Abstract

Background

In this study, the objective was to estimate the incidence and observe the presenting complaints, and clinical patterns of mesenteric lymphadenopathy with and without abdominal pain in children.

Methodology

An observational study has been conducted on outpatients and inpatients of pediatrics in RVM Hospital (Laxmakkapally, Mulugu, Siddipet, Telangana). Total patients of 101 with mesenteric lymphadenopathy were recruited in the study and all of them were treated with the antibiotic drug metronidazole. The ML was diagnosed using the USG abdomen and Wong Bakers' pain scale.

Results

From the results obtained, we hereby conclude that the incidence rate of abdominal pain in ML was 100%. the incidence rate of ML in patients who were admitted with abdominal pain was 17%. the ML was diagnosed predominantly in females.

Keywords: Mesenteric lymphadenopathy, abdominal pain, incidence, reoccurrence, metronidazole.

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Introduction

Recurrent Abdominal Pain (RAP) in children is defined as the presence of at least three episodes of abdominal pain severe enough to affect their activities over a period longer than three months [1,2]. Abdominal pain is the most common among chronic pains in younger children and the second most common chronic symptom after headache in older children and adolescents.

Abdominal pain is the most common among chronic pains in younger children and the second most common chronic symptom after headache in older children and adolescents [3]. The most common surgical disease in children with acute abdominal pain admitted to the emergency department is Acute Appendicitis (AA). Diagnostic discrimination between AA and Acute Mesenteric Lymphadenitis (AML) may sometimes be difficult as a result of the physical examination and laboratory studies after excluding other diagnoses such as diarrhea, urinary infection, intussusception,

and gastroenteritis [4,5]. Acute mesenteric lymphadenitis causes Right Lower Quadrant (RLQ) pain as in AA and its etiology may be due to primary (idiopathic) or secondary (infection, malignancy, etc.) reasons [6].

Although AML brings about abdominal pain, it does not cause any abnormalities in many healthy children with enlarged mesenteric lymph nodes. Wang et al. asserted in an ultrasound-guided clinical study that the mesenteric lymph nodes increase with age until 6 years and then decrease. Moreover, they supposed that AML with a short axis diameter larger than 8 mm could be related to abdominal pain [7].

Also, in another study, the short axis diameter of larger than 8 mm and even 10 mm was suggested for the definition of the pathologic mesenteric lymph node in children [8].

The consensus regarding the radiological and laboratory parameters which may be consistent with AML in the literature is still controversial

[9, 10].

The most common gastrointestinal complaints in AML are abdominal pain, nausea-vomiting, fever, and loose stools, respectively. The clinical and laboratory results of AA and AML may create uncertainty about what differential diagnosis will be made for most practitioners. While establishing a relationship between the clinic picture and mesenteric lymphadenitis (ML), patients with the short axis diameter of ML greater than 10 mm were excluded from the study in some studies; the others accepted that ML with a short-axis diameter of 8 mm or more constituted AML [8, 11, 12].

Erect Abdominal Radiographs (EAR) can provide supportive findings in the differential diagnosis of intestinal obstruction or ileus in children [13].

However, no study has made a differential diagnosis by establishing a relationship between EAR and the AML or AA patients' clinical characteristics. This study aimed to evaluate the clinical and laboratory parameters of patients with symptomatic AML and to compare them with those of AA patients, and also to further investigate those parameters based on lymph node size. Also, we examined which parameters should be taken into account regarding whether the AML patient should be hospitalized or discharged.

Methodology

An observational study has been conducted on outpatients and inpatients of pediatrics in RVM Hospital (Laxmakkapally, Mulugu, Siddipet, Telangana). Total patients of 101 with mesenteric lymphadenopathy were recruited in the study and all of them were treated with the antibiotic drug metronidazole.

Children of age below 18 years visiting the hospital with abdominal pain who are given metronidazole as their primary drug in the treatment were included in this study.

Children presented with significant mesenteric lymphadenopathy due to surgical causes. Children admitted with abdominal pain but no significant mesenteric lymphadenopathy on USG abdomen. Children joined in the hospital with the signs and symptoms other than mesenteric lymphadenopathy were excluded from the study.

■ Collection of data

- Data is collected by taking prescriptions. To collect the data, a carbon copy of the

original prescription will be collected by the investigator.

- Patients with complaints of abdominal pain will be completely evaluated by data collected through complete medical history, complete blood picture, USG abdomen (size), reoccurrence pattern, Patient interaction, questionnaire, and telephonic follow-ups.

■ Ethical committee approval

The ML was diagnosed using the USG abdomen and Wong Bakers' pain scale.

The Institutional Human Ethical Committee of GCPK approved the study. The code is given-GCPK/IEC/NOV2021-22/B05.

■ Statistical analysis

Descriptive statistics presentation of data in Bar chart, Pie chart values are expressed as Frequency, percentage, mean, SD, and SE. Comparison of mean wong baker faces scale values pre and post administration of a drug by using paired t-test and chi-square test for association between reoccurrence of abdominal pain and risk factors, all analysis, $P < 0.05$ was considered to be significant. All statistical analyses were performed using SPSS statistical software, version 22.

Results

A sum of 101 patients who met the study's eligibility criteria was enrolled. The patients were recruited from both Outpatient and In-patient Departments (TABLE 1)(FIGURE 1).

■ Incidence rate

$$\text{Incidence rate} = \frac{\text{Number of sick person in 6 months}}{\text{Total Number of observed person during 6 months}} + 1000$$

$$IR = \frac{101}{582}$$

$$= 0.173 \times 1000$$

$$\cong 173 \text{ per thousand person approx.}$$

Discussion

In this study, 101 pediatric patients attended the RVM Hospital and are identified with mesenteric lymphadenopathy (TABLES 2-6) (FIGURES 2-6).

Out of them, 39 males and 62 females were

TABLE 1. Gender distribution of patients.

Gender	Frequency	Percent
Male	39	39
Female	62	62
Total	101	100

joined with ML, showing predominance in females. All 101 patients were joined with C/C/O abdominal pain, hence, the incidence rate of abdominal pain in ML is observed to be

100 percent (TABLE 7-14)(FIGURES 7-14).

About 54 patients had a C/C/O of vomiting, 22 patients had a fever, 6 patients with constipation, 6 patients with loose stools, 10 patients with loss of

FIGURE 1. Ratio of gender distribution of the patients.

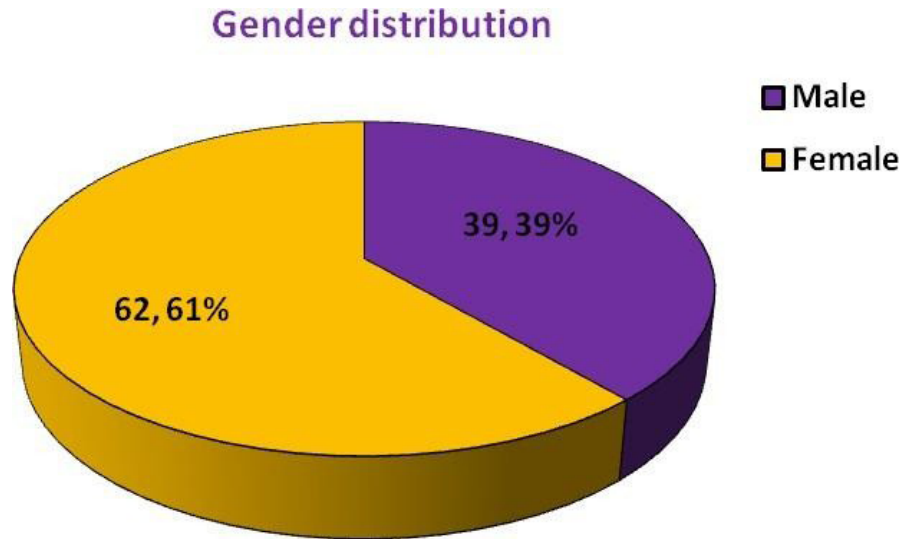


TABLE 2. Age details of the recruited patients.

Parameter	N	Minimum	Maximum	Mean	SD
Age	101	2	18	12.08	4.05

TABLE 3. Age distribution of patients.

Age(years)	Frequency	Percent
Less than 5	6	5.9
5 to 10	22	21.8
11 to 15	57	56.4
More than 15	16	15.8
Total	101	100

FIGURE 2. Ratio of age distribution of the patients.

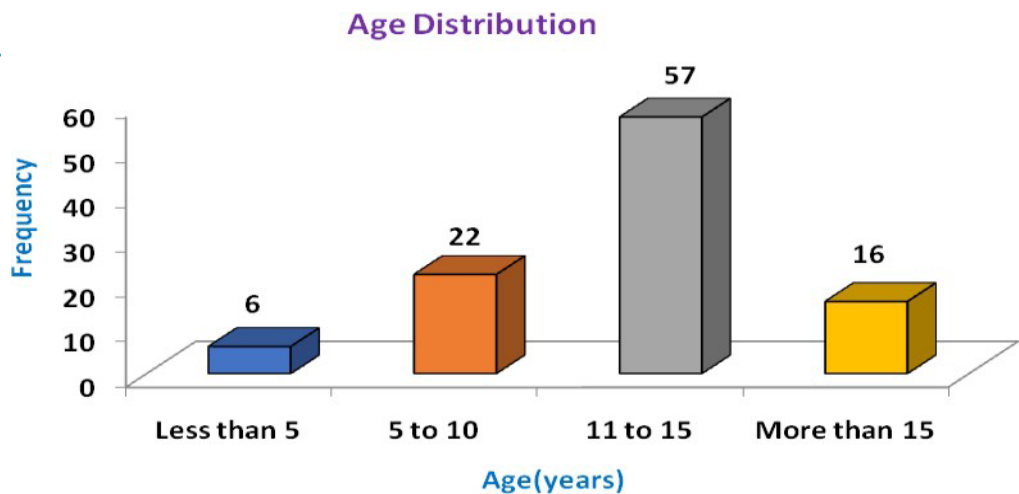


TABLE 4. Patients with c/c/o abdominal pain.

Complaint of abdominal pain	Frequency	Percent
Present	101	100
Absent	0	0
Total	101	0

ABDOMINAL PAIN

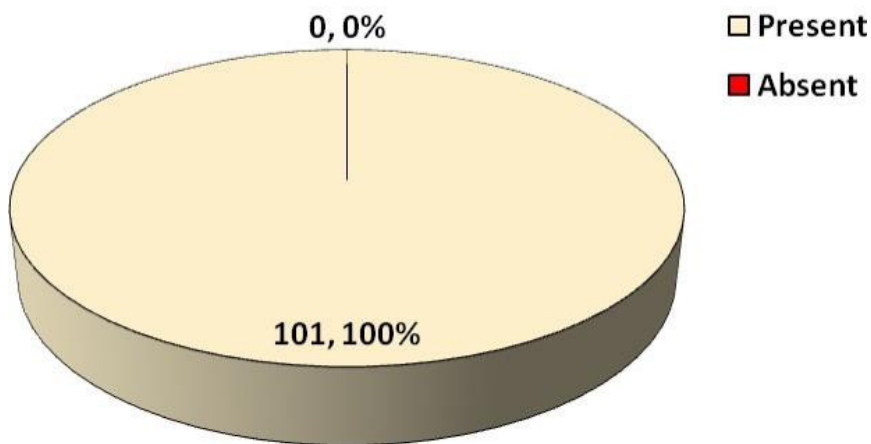


FIGURE 3. Ratios of patients with abdominal pain.

TABLE 5. Patients with c/c/o vomiting.

Vomitings	Frequency	Percent
Present	54	53.5
Absent	47	46.5
Total	101	100

VOMITINGS

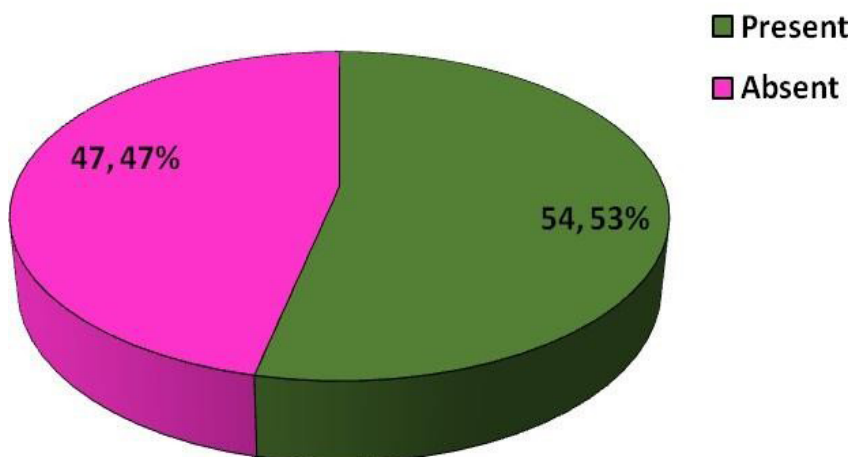


FIGURE 4. Ratio of c/c/o vomiting in the patients.

TABLE 6. Patients with c/c/o fever.

Fever	Frequency	Percent
Present	22	21.8
Absent	79	78.2
Total	101	100

FEVER

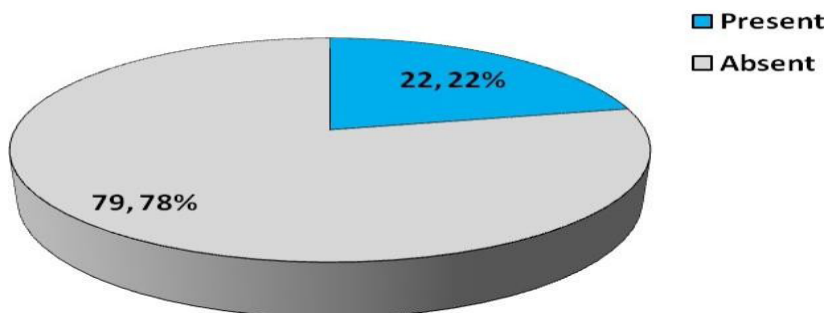


FIGURE 5. Ratio of c/c/o fever in the patients.

TABLE 7. Patients with c/c/o headache.

Headaches	Frequency	Percent
Absent	101	100
Present	0	0
Total	101	100

FIGURE 6. Ratio of c/c/o headache in the patients.

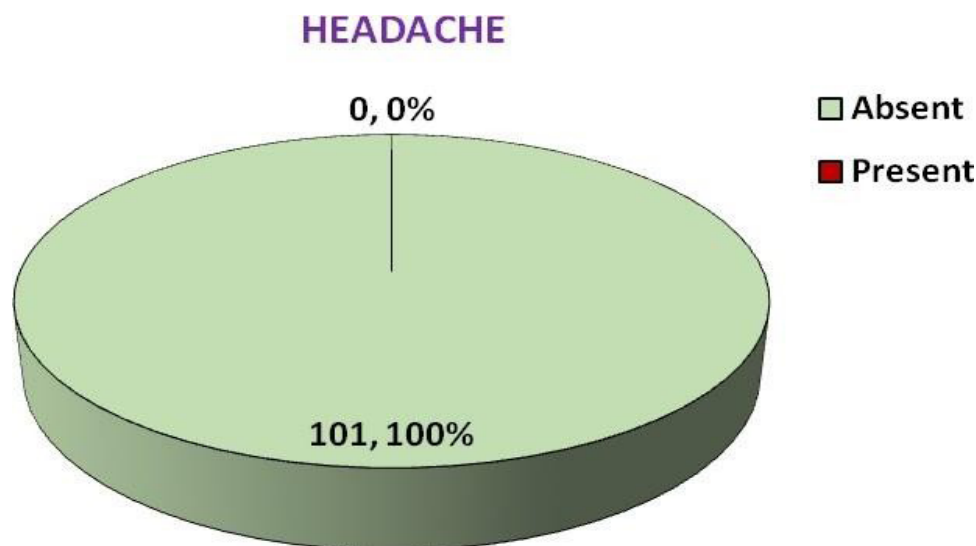


TABLE 8. Duration of the hospital stay details among the patients.

Parameter	N	Minimum	Maximum	Mean	SD
Duration of hospital stay	101	1	9	4.42	1.81

TABLE 9. Patients with other c/c/o.

Other C/C/O	Frequency	Percent
Constipation	6	5.9
Loose stools	6	5.9
Loss of appetite	10	9.9
Nausea	5	5
Absent	74	73.3
Total	101	100

FIGURE 7. Ratio of other c/c/o in the patients.

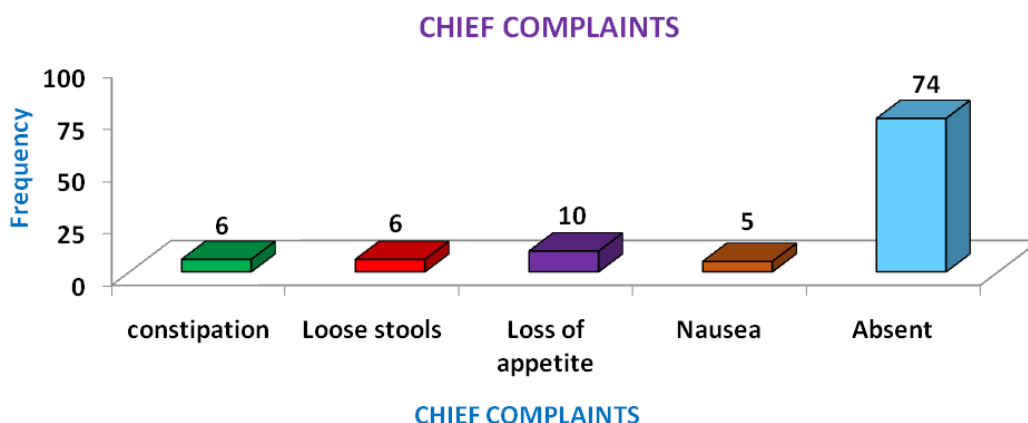


TABLE 10. Patients with c/c/o pallor.

Pallor	Frequency	Percent
Present	11	10.9
Absent	90	89.1
Total	101	100

PALLOR

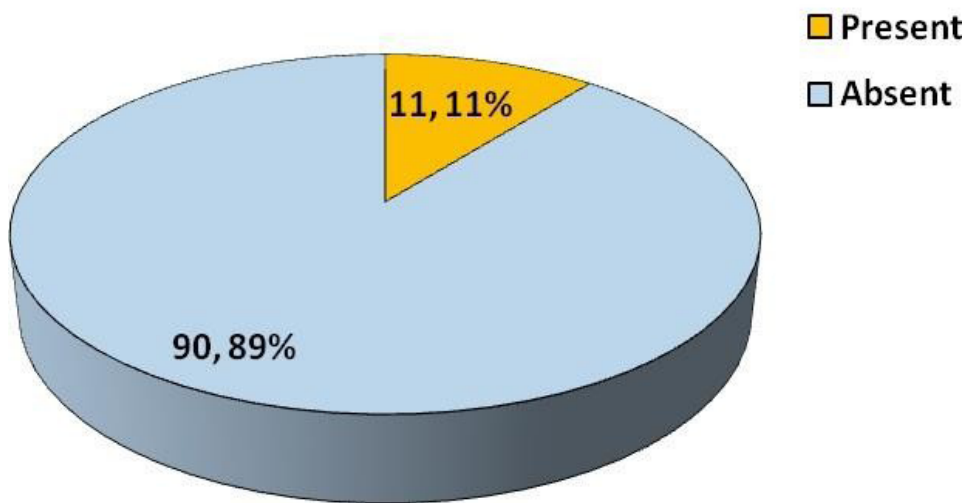


FIGURE 8. Ratio of c/o pallor in the patients.

TABLE 11. Abdominal tenderness among patients.

Abdominal tenderness	Frequency	Percent
Localized	75	74.3
Diffused	26	25.7
Total	101	100

ABDOMINAL TENDERNESS

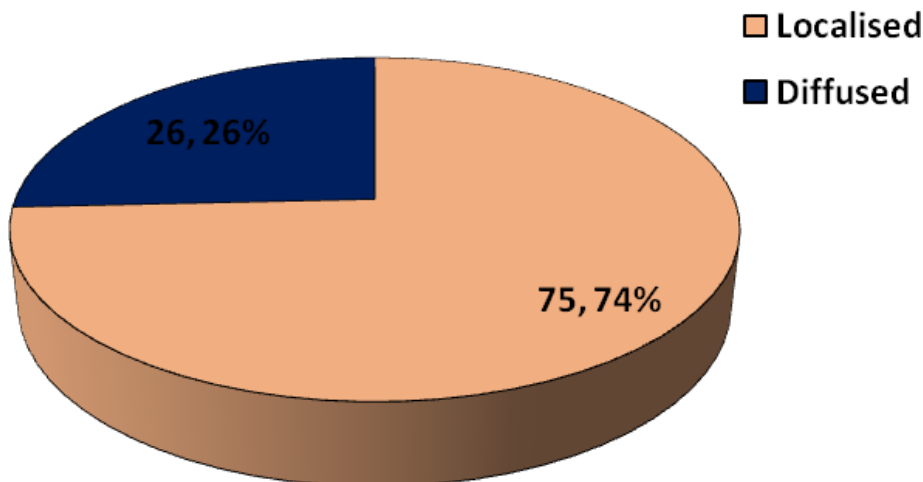


FIGURE 9. Ratio of abdominal tenderness among the patients.

TABLE 12. USG Abdominal (size) distribution of patients.

USG abdomen	Frequency	Percent
5 cm to 10 cm	46	45.5
11 cm to 20 cm	23	22.8
More than 20 cm	6	5.9
Multiple nodes	26	25.7
Total	101	100

appetite, and 5 patients with nausea.

Anemia is one of the underlying causes of ML. The common sign of anemia is pallor and in the above study, 11 patients were presented with pallor (TABLES 15-21)(FIGURES 15-18).

In the data collected, 75 patients had localized abdominal tenderness and 26 patients had diffuse abdominal tenderness.

The diagnosis of the ML is mainly based on the USG abdomen. The size of the MLN above 5

FIGURE 10. Ratio of usg abdomen of the patients.

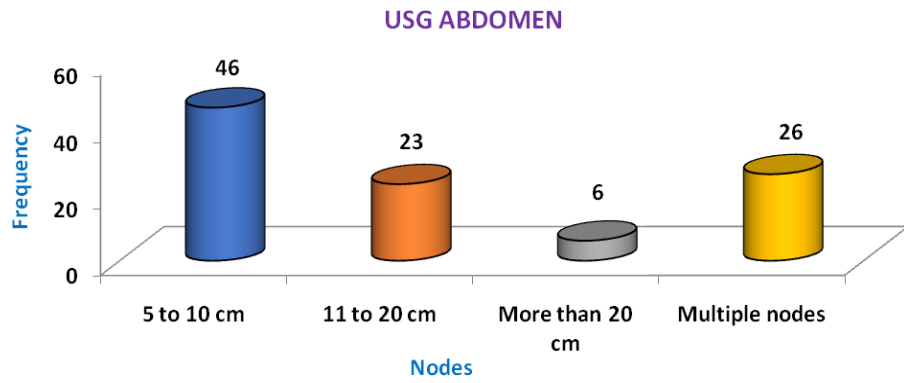


TABLE 13. Pain scale among the patients (before treatment).

Wong-baker faces scale (before)	Frequency	Percent
Normal	0	0
Mild	0	0
Moderate	31	30.7
Severe	70	69.3
Total	101	100

TABLE 14. Pain scale among the patients (after treatment).

Wong-baker faces scale (after)	Frequency	Percent
Normal	70	69.3
Mild	26	25.7
Moderate	5	5
Severe	0	0
Total	101	100

FIGURE 11. Ratio of pain scale among the patients (before and after therapy).

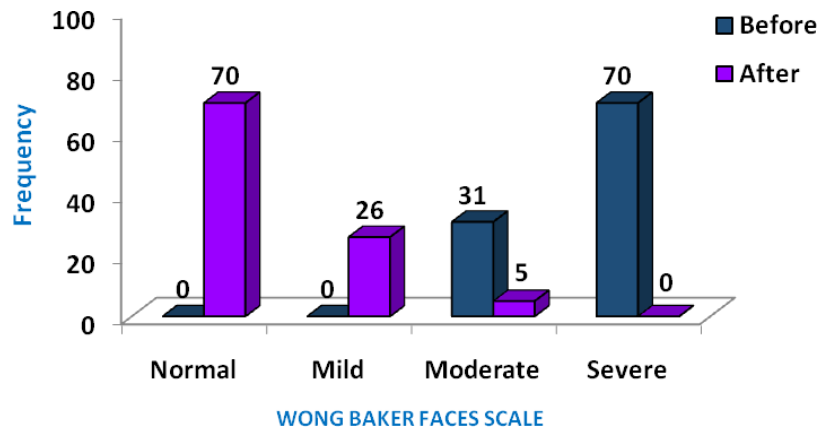


TABLE 15. Antibiotics administered among the patients.

Antibiotics	Frequency	Percent
Metronidazole	101	100

FIGURE 12. Ratio of antibiotic therapy among the patients.

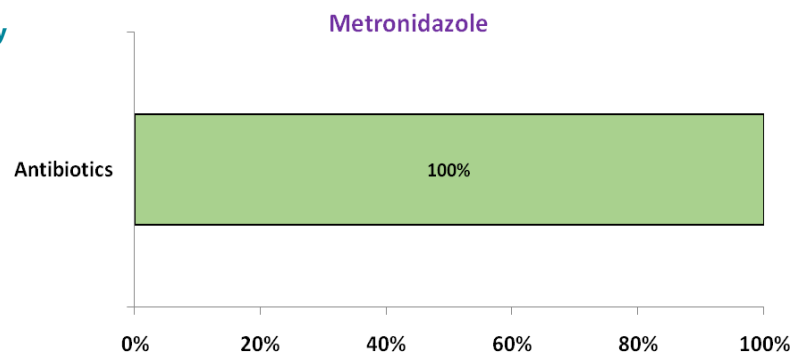


TABLE 16. Reoccurrence pattern among the patients.

Reoccurrence	Frequency	Percent
Present (1 week)	5	5
Present (2 weeks)	5	5
Present (3 weeks)	5	5
Present (1 Month)	16	15.8
Absent	70	69.3
Total	101	100

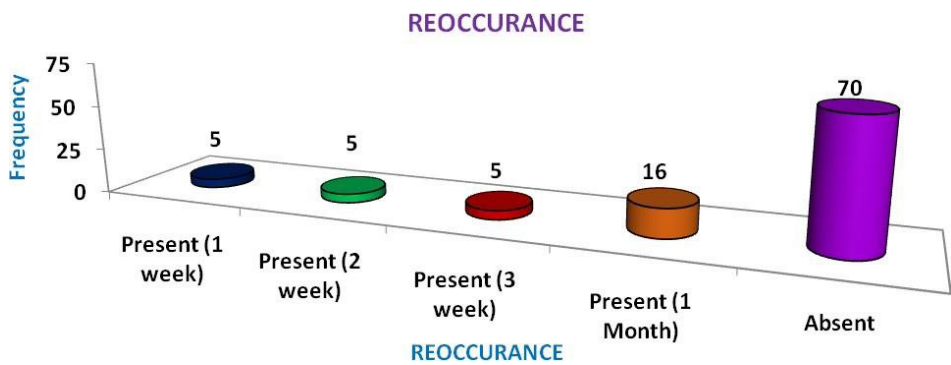


FIGURE 13. Ratio of reoccurrence pattern of the patients.

TABLE 17. Antacids administered among the patients.

Antacids	Frequency	Percent
Pantop	62	61.4
Rantac	39	38.6
Total	101	100

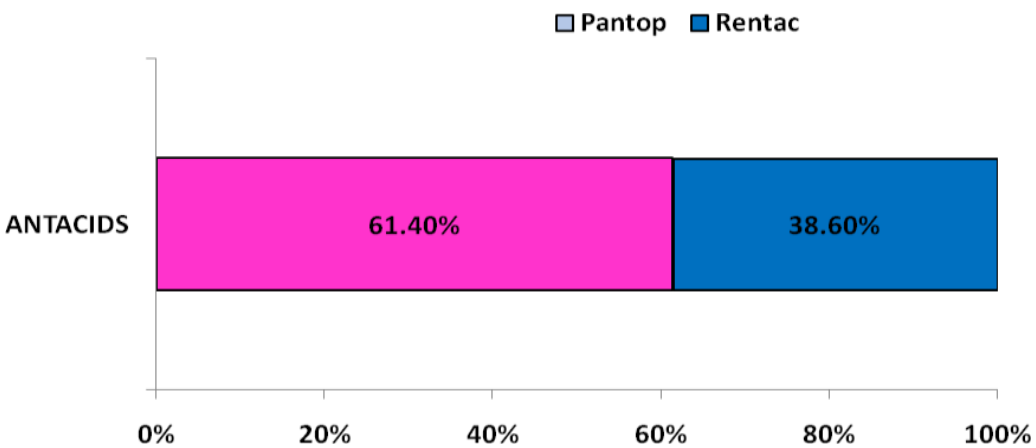


FIGURE 14. Ratio of antacids administered among the patients.

Table 18. Anthelmintics administered among the patients.

Anthelmintic	Frequency	Percent
Albendazole	27	26.7
Nil	74	73.3
Total	101	100

FIGURE 15. Ratio of antihelminthic therapy among the patients.

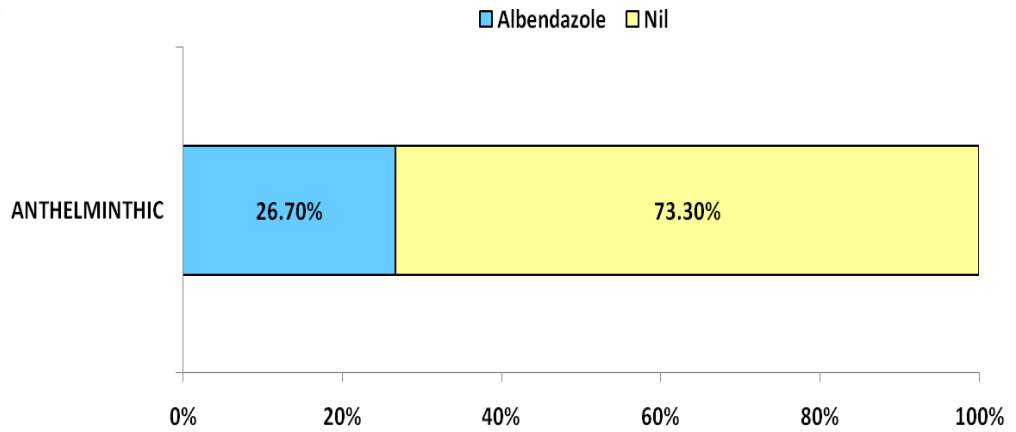


TABLE 19. Details of the milk intake in the patients.

Intake of milk	Frequency	Percent
Yes	35	34.7
No	66	65.3
Total	101	100

FIGURE 16. Ratio of milk consumption among the patients.

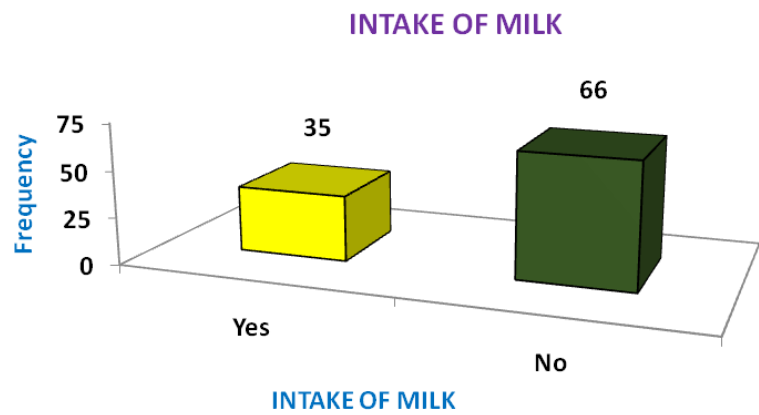


TABLE 20. Details of the water source among the patients.

Water source	Frequency	Percent
Groundwater	36	35.6
Filter water	65	64.4
Total	101	100

FIGURE 17. Ratio of water source among the patients.

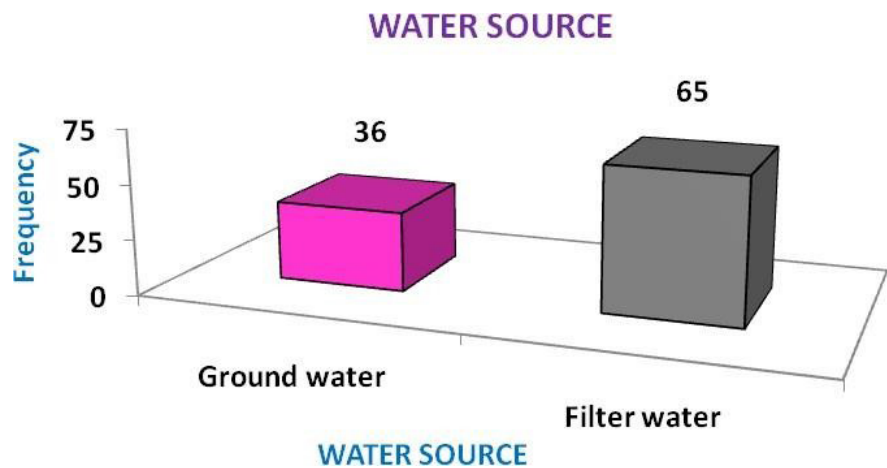


TABLE 21. Pain scale details among the patients.

Wong-baker faces a scale	Mean	Mean difference	t- value	Significance
Before	7.05 ± 1.26	6.45	36.5	0.0001*
After	0.60 ± 1.11			

*- P<0.05; mean Pain score values are statistically significant between before and after by using paired student t-test.

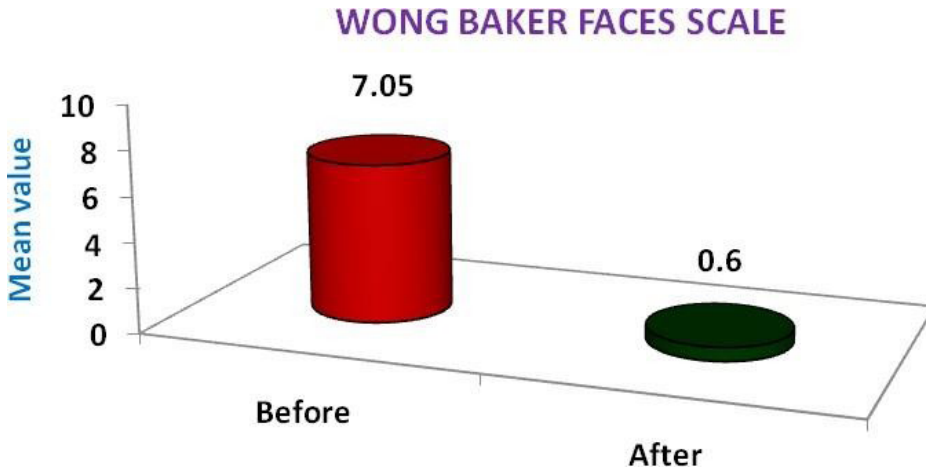


FIGURE 18. Ratio of pain scale among the patients.

TABLE 22. Reoccurrence pattern for intake of milk.

Crosstab					
		Intake of milk		Total	
		Yes	No		
Reoccurrence	Present	Count	24	7	31
		% within REOCCURANCE	77.40%	22.60%	100.00%
	Absent	Count	11	59	70
		% within REOCCURANCE	15.70%	84.30%	100.00%
Total	Count	35	66	101	
	% within REOCCURANCE	34.70%	65.30%	100.00%	

TABLE 23. Chi-square tests.

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	36.125 ^a	1	0	0	0	
Continuity Correction	33.452	1	0			
Likelihood Ratio	36.341	1	0	0	0	
Fisher's Exact Test				0	0	
Linear-by-Linear Association	35.768 ^c	1	0	0	0	0
N of Valid Cases	101					

*- P<0.05 there is a significant association between intake of milk and reoccurrence by using the chi-square test.

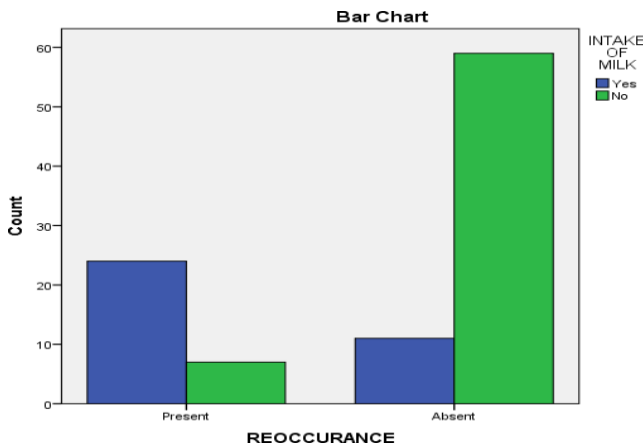


FIGURE 19. Reoccurrence of intake of milk.

mm or more is diagnosed as ML. In the study, 46 patients were diagnosed with 5 mm-10 mm, 23 patients were diagnosed with 11 mm-20 mm, 6 patients were diagnosed with >20 mm, 26 patients were diagnosed with inflammation of multiple nodes (FIGURES 19 and 20)

The presenting complaint of abdominal pain was categorized based on the facial expressions using

the Wong-bakers face scale (FIGURE 21).

Before the initiation of treatment, about 70 patients and 31 patients suffering from severe and moderate abdominal pain, respectively.

The ML patients were primarily treated with antibiotics. The primary drug given to the patients in our study is metronidazole. All 101

TABLE 24. Reoccurrence pattern for water source.

Crosstab					
		Water source			Total
		Groundwater	Filter water		
Reoccurrence	Present	Count	22	9	31
		% within reoccurrence	71.00%	29.00%	100.00%
	Absent	Count	14	56	70
		% within reoccurrence	20.00%	80.00%	100.00%
Total		Count	36	65	101
		% within reoccurrence	35.60%	64.40%	100.00%

TABLE 25. Chi-square test.

	Value	df	Asymp. Sig. (2- sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	24.331	1	0	0	0	
Continuity Correction	22.16	1	0			
Likelihood Ratio	24.163	1	0	0	0	
Fisher's Exact Test				0	0	
Linear-by-Linear Association	24.090	1	0	0	0	0
N of Valid Cases	101					

*- P<0.05 there is a significant association between water source and reoccurrence by using the chi-square test.

FIGURE 20. Reoccurrence of water source.

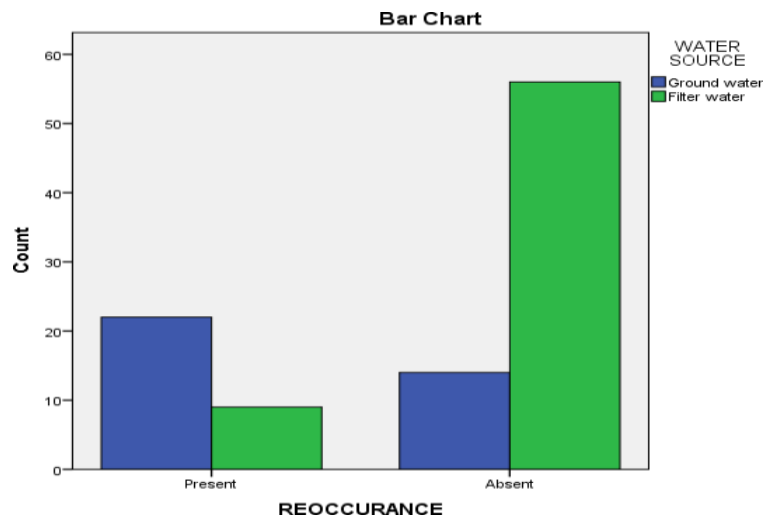
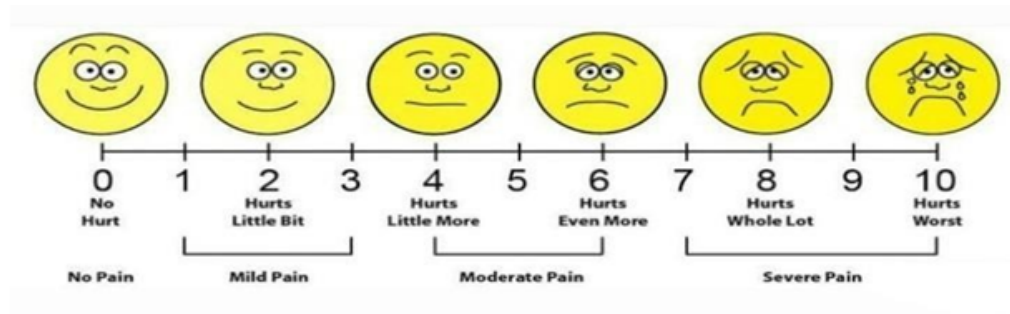


FIGURE 21. Facial expressions using the Wong-bakers face scale.



patients were given metronidazole.

The secondary drugs used in the treatment of ML are antacids and anthelmintics. 62 patients were treated with pantop and 39 patients with rantac, and 27 patients were with albendazole (TABLES 22 and 23)(FIGURES 19 and 20).

After the therapy, the pain was again assessed using the Wong bakers faces scale, in 70 patients the pain got reduced, 5 patients are suffering from moderate pain, and 26 patients are suffering from mild pain.

The reoccurrence was seen among 5 patients in 1st week, 5 patients in 2nd week, 5 patients in 3rd week, and 16 patients in 1st month. The reoccurrence was not found among 70 patients.

The reoccurrence was present in 24 patients whose diet consists of milk intake and 7 patients whose diet doesn't include milk intake.

The reoccurrence was absent in 11 patients whose diet consists of milk intake and 59 patients whose diet doesn't include milk intake.

The reoccurrence was present in 22 patients who consume groundwater and 9 patients who consume filter water.

The reoccurrence was absent in 14 patients who consume groundwater and 56 patients who consume filter water (TABLES 24 and 25).

Conclusion

The ML was predominantly seen in females. The average age of this condition in children is 12 years. The abdominal pain was relieved after the use of metronidazole and the reoccurrence rate was found to be less. Metronidazole has good efficacy in patients with mesenteric lymphadenopathy. Patients with milk intake have more reoccurrence rate than compared to patients without milk intake. The reoccurrence was less in patients who consumed filter water compared to groundwater consumption.

Strengths and limitations

Strengths

- The assessment of the presenting complaints and reoccurrence patterns has added the greatest strength to our study.
- Secondly, the follow-ups of the patients have immensely helped in gathering their medication adherence and relieving abdominal pain.
- In our study, lifestyle modifications play a very major role in ML such as milk intake and water source,
- It also enabled us to educate them regarding the medication, diet plan, and lifestyle modifications such as milk intake and water source as they play a major role in ML.
- From this study, the incidence rate of ML among patients with abdominal pain had been calculated.

Limitations

- There are certain limitations to our study, which firstly include, the small size of the subjects of 101 patients.
- Secondly, Short term evaluation of the reoccurrence pattern for only 1 which would oversee the fluctuations in the reoccurrence of abdominal pain and also increase of the lymph node size which is rare and could be easily affected by the diet, lifestyle & also the level of medication adherence, which limited our ability to reach a clear conclusion in our subjects.

Funding

None

Conflict of interest

The authors declare that there is no conflict of interest.

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