



ORIGINAL ARTICLE

Prospects of mesenteric lymphadenopathy in children with chronic abdominal pain (CAP).

Sahar Javed¹, Khurram Nadeem², Muhammad Zahid³

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ABSTRACT... Objective: To evaluate the incidence rate and severity of mesenteric lymphadenopathy in children presenting with CAP in comparison with healthy counterparts. **Study Design:** Prospective Cross-sectional study. **Setting:** Department of Pediatric, Nishtar Medical University & Hospital Multan. **Period:** June 2020 to June 2021. **Material & Methods:** The prospective cross-sectional study included children aged between 5 to 15 years who were divided into two groups: the study group included children who presented with CAP and the control group included the ones who visited the hospital to undergo abdominal sonography for other reasons. All the study population underwent analysis through abdominal ultrasonography. The existence of enlarged nodules, their size, location, and other related findings was assessed. Baseline characteristics were analyzed in both groups through descriptive statistics whereas Pearson's Chi-square test was performed for comparison of categorical variables. **Results:** After passing through the study criteria, a total of 80 cases were compared with 110 controls. No significant difference was between the two genders in terms of the occurrence of mesenteric lymphadenopathy. 62 (77.5%) cases were found positive for mesenteric lymph nodes (MLN) by ultrasonography as compared to 19 (17.2%) positive controls. Among them, 42 CAP (52.5%) cases had significant MLN (>10mm long axis or ≥5 mm short axis) while 8 (7.2%) controls were found to have significant MLN ($p < 0.001$). The mesenteric lymph nodes were most commonly located in the right iliac fossa (82%) and peri-umbilical region (75.1%). **Conclusion:** Mesenteric lymphadenopathy is a significant finding in children with chronic abdominal pain.

Key words: Chronic Abdominal Pain, Lymph Nodes, Mesenteric Lymphadenopathy.

INTRODUCTION

Chronic abdominal pain (CAP) is a persistent, intermittent pain that has lasted for at least 1 month.¹ It has been found to have several etiologies. However, only a few organic disturbances are found to be associated with CAP in children in imaging studies.^{2,3} CAP is prevalent in school-age children with an incidence rate of about 10–12%.^{4,5}

Reportedly, a high proportion of children with CAP present with non-specific mesenteric lymphadenopathy (MLA).⁶ Non-specific or primary MLA is usually characterized as right-sided lymphadenopathy with unknown underlying etiology. These patients have very limited unusual findings on imaging modalities such, for instance, few cases were reported to have a slight swelling

on the last segment of the ileum or cecum.⁷ Radiologically, MLA is diagnosed in subjects with 3 or >3 lymph nodes sized larger than 5mm on the short axis.^{2,8}

Abdominal ultrasound (US) is a reliable diagnostic modality with high diagnostic and prognostic value in children with CAP. Given the limited known organic causes, CAP has become a diagnostic challenge. Moreover, although MLA is common in children, due to limited findings in imaging analysis the prevalence of MLA in children with CAP can't be established. Therefore, the study is designed to evaluate the incidence rate and severity of mesenteric lymphadenopathy in children presenting with chronic abdominal pain (CAP) in comparison with controls.

1. MBBS, FCPS, Senior Registrar Pediatric, Children Hospital Lahore.
2. BDS, MCPS, Associate Professor Oral Medicine, Lahore Medical & Dental College, Lahore.
3. MBBS, FCPS, Senior Registrar Pediatric Medicine, Nishtar Hospital Multan.

Correspondence Address:
Dr. Muhammad Zahid
Department of Pediatric Medicine
Nishtar Hospital Multan.
drzahid33@yahoo.com

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MATERIAL & METHODS

A Prospective, Observational study was conducted at the Pediatric Department of Nishtar Medical University & Hospital Multan for 1 year from June 2020 to June 2021. The study consisted of two groups: study group and controls. The study group included children aged between 5 to 15 years who presented with chronic abdominal pain and underwent abdominal ultrasonography whereas the control group included children who were referred to undergo abdominal sonography for symptoms other than chronic abdominal pain. Children with diagnosed causes of MLN such as rheumatic disorders, abdominal tuberculosis, malignancy, and gastroenteritis and those with known reasons for CAP like renal calculi, abdominal TB, dysmenorrhoea, and pancreatitis were excluded from both study groups. Baseline data and findings on physical examination were collected from both groups. Abdominal ultrasonography was performed on all the participants by an experienced radiologist and the existence of enlarged nodes, their size, location, and other significant characteristics were observed. Each lymph node was assessed in 2 dimensions: short and long axis. A lymph node $\geq 5\text{mm}$ on a short axis or $> 10\text{mm}$ on the long axis was significantly important.

SPSS (version 18) was used for statistical analysis. Baseline characteristics were analyzed in both groups through descriptive statistics whereas Pearson's Chi-square test was performed for comparison of categorical variables. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 160 children were included in the study. Among them, 80 were cases of CAP while 110 were control. Abdominal sonography was performed in controls for ruling out multiple disorders such as genetic malformations, renal and hepatic disorders, and miscellaneous syndromes. CAP had a higher incidence among male children but the difference in incidence rate was not considered among the two genders. CAP was more commonly presented among younger children as the majority of CAP cases (69.5%)

were in between 5-10 years. Children in the study group had a mean weight of 22.87 ± 7.34 while children in the control group had 24.11 ± 9.12 (Table-I).

Patient history revealed that 55 children with CAP were experiencing the pain for a mean period of 3 months (range: 2-6 months). Table-II presents that vomiting and constipation were the major symptoms besides abdominal pain. Whereas, abdominal tenderness and pallor were the major signs in such children.

Ultrasonography revealed that MLNs were found in 62 (77.5%) CAP cases and 19 (17.2%) controls. Among these subjects with visualized MLNS, 42 (52.5%) CAP cases had significant MLN as compared to 8 (7.2%) controls. The difference in the incidence rate of visualized MLNs and significant MLNs between the two groups was statistically significant (Table-III).

Table-IV demonstrates the location of MLNs in both groups. It was found out that the mesenteric lymph nodes were most commonly located in the right iliac fossa and peri-umbilical region in both groups. This finding complies with the physical findings as the abdominal tenderness was also more in the right iliac fossa and peri-umbilical region in the children with CAP.

Variables	Study group (n=80)	Control group (n=110)
Sex		
Male	47	48
Female	33	64
Age (years)		
5-10	57 (69.5%)	71 (64.5%)
10-15	23 (28.7%)	39 (35.4%)
BMI (kg/m²)		
Less than 3 centile	36 (45%)	42 (38.1%)
More than 3 centile	44 (55%)	68 (61.8%)
Weight (kg)	22.87 ± 7.34	24.11 ± 9.12
Height (cm)	132.44 ± 15.2	126.33 ± 19.52

Table-I. Baseline characteristics of the participants (n=190)

Variables	n (%)
Vomiting	18 (22.5%)
Constipation	9 (11.2%)
Fever	7 (8.75%)
Pallor	19 (23.7%)
Abdominal tenderness	18 (22.5%)
Hepatomegaly	5 (6.25%)

Table-II. Sign and symptoms in the study group (n=80)

Mesenteric Lymph Nodes	Study Group (n=80)	Control Group (n=110)	P-Value
Visualized	62 (77.5%)	19 (17.2%)	<0.001
Not visualized	18 (22.5%)	91 (82.7%)	
Significant MLN	42 (52.5%)	8 (7.2%)	<0.001

Table-III. Mesenteric lymph nodes

Location	Study Group (n=62)	Control Group (n=19)
RIF	15	7
Peri-umbilical	13	4
Peri-umbilical + RIF	21	6
Epigastric, Peri-umbilical, RIF, and LIF	11	2
Peri-umbilical, RIF, LIF	2	0

Table-IV. Mesenteric lymphadenopathy on basis of location
RIF= right iliac fosa, LIF= left iliac fosa

DISCUSSION

John Apley, a British pediatrician, defined Recurrent abdominal pain (RAP) as "pain that waxes and wanes, occurring at least 3 times over a period longer than 3 months and severe enough to affect a child's activities".⁹ Later, in 2005, the American Academy of Paediatrics (AAP) Subcommittee on Chronic Abdominal Pain replaced the terminology RAP with CAP and described the chronic pain as "long-lasting intermittent or constant abdominal pain that is either functional or organic". Precisely, an abdominal pain that persists for more than one or two months is considered chronic.¹⁰ Although both CAP and RAP are part of medical literature CAP remains the preferred term as it includes the idea of RAP as well. CAP is prevalent among children with an incidence rate of 0.5 to 19%.¹¹ Boey et al. Investigated Malaysian school children and found

10.2% of the participants were suffering from CAP.¹² The incidence peak is usually observed in two age brackets: between 4-6 years and between 7-12 years.¹¹⁻¹³ In the present study, CAP was more common in children aged between 5-10 years with male dominance; however, the gender difference was not considerable. Whereas, many previous studies have documented female predominance.¹¹

The studies believe in only 10% of CAP cases, the underlying pathology is evident or can easily be identified. An India-based study concluded intestinal parasitic infections as one of the major causes of CAP.^{13,14} Whereas, in developed states, constipation and gastroesophageal reflux disease also play a major role in causing CAP.^{15,16} There is also a hypothesis that H.pylori is significantly associated with CAP but this notion can still not be proved.¹⁴ Lastly, social and family triggering agents such as school issues, domestic violence, and parental separation have been associated with CAP.¹⁷

Abdominal ultrasonography is considered a reliable diagnostic tool to investigate the underlying organic pathology. MLN is commonly reported in CAP presenting children in abdominal ultrasonograph, but literature is scarce on its significance. Our study has found a significantly greater incidence of MLNs in children with CAP as compared to controls. 77.5% of the analyzed cases were found to be positive MLNs.

The study results are similar to a recently published study in India who found that 74.29% of children aged between 2-10 years suffering from CAP had mesenteric lymphadenopathy.¹⁸ We have considered lymph nodes greater than 5mm on the short axis as significant but recent literature suggests that short-axis diameter > 8mm of at least 1 lymph node is considered considerable.¹⁹ In our study, MLNS are majorly found in the periumbilical and right iliac fossa but an earlier study reported right lower abdomen was home to 79% of MLNs.

Our study has however failed to explore the underlying etiology of the CAP and only

established the association of CAP and MLN. Similarly, children were not followed up for clinical conditions which is a major limitation of the disease.

CONCLUSION



Mesenteric lymphadenopathy is a significant finding in children with chronic abdominal pain.

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REFERENCES

1. Toro Monjaraz EM, Vichido Luna MA, Montijo Barrios E, Cervantes Bustamante R, Zárata Mondragón F, Huante Anaya A, et al. **Blastocystis hominis and chronic abdominal pain in children: Is there an association between them?** Journal of tropical pediatrics. 2018; 64(4):279-83.
2. Nadeem U, Anjum N, Farooq F, Gillani S. **A sonographic evaluation of pediatric acute abdominal pain: A systematic review.** Biological and Clinical Sciences Research Journal. 2021; 2021(1).
3. Van der Meer S, Forget P, Arends J, Kuijten R, Van Engelshoven J. **Diagnostic value of ultrasound in children with recurrent abdominal pain.** Pediatric radiology. 1990; 20(7):501-3.
4. Rajindrajith S, Zeevenhooven J, Devanarayana NM, Perera BJC, Benninga MA. **Functional abdominal pain disorders in children.** Expert review of gastroenterology & hepatology. 2018; 12(4):369-90.
5. Abbott RA, Martin AE, Newlove-Delgado TV, Bethel A, Whear RS, Coon JT, et al. **Recurrent abdominal pain in children: Summary evidence from 3 systematic reviews of treatment effectiveness.** Journal of pediatric gastroenterology and nutrition. 2018; 67(1):23-33.
6. Balakrishnan VS, Aroor S, Kumar S, Kini PG, Saseendran A. **Mesenteric lymphadenopathy in children with chronic abdominal pain.** Sri Lanka Journal of Child Health. 2018; 47(4):348-53.
7. Otto M, Nagalli S. **Mesenteric adenitis.** Stat Pearls [Internet]. 2021.
8. Uinarni H, Tanjung C, Putra AP, Sukmana BI, Wahyudi H, Zuhair A, et al. **The importance of ultrasound findings in children with acute abdominal pain to prevent unnecessary surgery.** Systematic Reviews in Pharmacy. 2020; 11(4):377-83.
9. Apley J, Naish N. **Recurrent abdominal pains: A field survey of 1,000 school children.** Archives of disease in childhood. 1958; 33(168):165.
10. Reust CE, Williams A. **Recurrent abdominal pain in children.** American family physician. 2018; 97(12):785-93.
11. Devanarayana NM, de Silva DGH, de Silva HJ. **Recurrent abdominal pain syndrome in a cohort of Sri Lankan children and adolescents.** Journal of tropical pediatrics. 2008; 54(3):178-83.
12. Boey CCM, Goh KL. **Predictors of recurrent abdominal pain among 9 to 15-year-old urban school children in Malaysia.** Acta Paediatrica. 2001; 90(3):353-5.
13. DEVANARAYANA N, Rajindrajith S, De Silva HJ. **Recurrent abdominal pain in children.** Indian pediatrics. 2009; 46(5).
14. Shoaib M, Abdullah MM, Sharif K. **Helicobacter pylori infection with recurrent abdominal pain in children: helicobacter pylori infection with recurrent abdominal pain.** The International Journal of Frontier Sciences. 2021; 5(2).
15. Eidlitz-Markus T, Mimouni M, Zeharia A, Nussinovitch M, Amir J. **Occult constipation: A common cause of recurrent abdominal pain in childhood.** Isr Med Assoc J. 2004; 6(11):677-80.
16. Adeniyi OF, Odeghe EA, Lawal MA, Olowu AO, Ademuyiwa A. **Recurrent abdominal pain and upper gastrointestinal endoscopy findings in children and adolescents presenting at the Lagos University Teaching Hospital.** PloS one. 2019; 14(5):e0216394.
17. Chitkara DK, Rawat DJ, Talley NJ. **The epidemiology of childhood recurrent abdominal pain in Western countries: A systematic review.** Official journal of the American College of Gastroenterology| ACG. 2005; 100(8):1868-75.
18. Singh IK. **Mesenteric lymphadenopathy: A common cause of chronic abdominal pain in children.** International Journal. 2020; 3(1):28.
19. Karmazyn B, Werner EA, Rejaie B, Applegate KE. **Mesenteric lymph nodes in children: what is normal?** Pediatric radiology. 2005; 35(8):774-7.

AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Tasleem Bano	Review, Data collection and analysis.	
2	Sughra Zulfiqar	Proof reading, Concept and Data analysis.	
3	Taimur Khalil Shiekh	Manuscript writing, Editing and Collection data.	