Quality of Life in Children With Recurrent Abdominal Pain Caused by Helicobacter Pylori Infection in Bandung, Indonesia

Dwi Prasetyo¹, MD, PhD; Yudith Setiati Ermaya¹, MD; Eddy Fadlyana², MD, PhD; Kusnandi Rusmil², MD, PhD

1 Division of Gastrohepatology Pediatric, Department of Child Health, Faculty of Medicine Padjadjaran University, Dr. Hasan Sadikin General Hospital Bandung, West Java, Indonesia; 2 Division of Growth Development-Social Pediatric, Department of Child Health, Faculty of Medicine Padjadjaran University, Dr. Hasan Sadikin General Hospital Bandung, West Java, Indonesia.

Conflict-of-interest statement: The authors declare that there is no conflict of interest regarding the publication of this paper.

Open-Access: This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/

Correspondence to: Dwi Prasetyo, Professor, MD, PhD, Pediatrician, Consultant of Gastrohepatology, Department of Child Health, Faculty of Medicine Padjadjaran University, Dr. Hasan Sadikin General Hospital, Bandung 40161, West Java, Indonesia. Email: dpras2016@gmail.com Telephone: + (62) (022)2035957 Fax: + (62) (022)2035957

Received: October 8, 2020
Revised: November 18, 2020
Accepted: November 23, 2020
Published online: December 21, 2020

ABSTRACT

AIM: Recurrent abdominal pain (RAP) is a common problem among children. Currently Helicobacter pylori (H. pylori) infection is one of the largest organic causes in children with RAP. Several studies reported the associations between quality of life (QOL) and RAP remained controversial. Our study aimed to determine QOL in children with RAP caused by H. pylori infection.

METHODS: A cross-sectional study was conducted on junior and senior high school students age ranged from 12 to 18 in Bandung at 2017, who were presenting RAP with H. pylori infection. Analysis of QOL between positive and negative H. pylori infection using chi square test and p value ≤ 0.05 was considered statistically significant.

RESULTS: The number of children who experience RAP there were 439 out of 2,538 school children (17.3%). Those who met the inclusion criteria in this study were 149 children with 46 were positive for H. pylori infection (30.9%). There was no significant association QOL with H. pylori infection in children with RAP (p = 0.043).

CONCLUSIONS: Our study found there was a tendency bad QOL in children infected with H. Pylori more than good QOL, nevertheless no significant differences among both H. pylori-infected and non-infected children.

Key words: Children; Helicobacter pylori; Recurrent abdominal pain; Quality of life

© 2020 The Authors. Published by ACT Publishing Group Ltd. All rights reserved.

Prasetyo D, Ermaya YS, Fadlyana E, Rusmil K. Quality of Life in Children With Recurrent Abdominal Pain Caused by Helicobacter Pylori Infection in Bandung, Indonesia. Journal of Gastroenterology and Hepatology Research 2020; 9(6): 3389-3392 Available from: URL: http://www.ghrnet.org/index.php/joghr/article/view/3007

INTRODUCTION

Recurrent abdominal pain is a common problem one of the most prevalent conditions in children and adolescents population worldwide. Recurrent abdominal pain in children is defined as at least three episodes of pain that occur over at least three months and affect the child’s ability to perform normal activities. Chronic or recurrent episodes of abdominal pain can be explained as symptom of an underlying organic disease or can be defined as functional abdominal pain. When infectious, inflammatory, structural, or biochemical processes are absent. Abdominal pain is often an alarming symptom which leads to frequent healthcare consultation. Few studies conducted in children with abdominal pain, have reported healthcare consultation of 39% to 93% in affected children.

Recurrent abdominal pain may responsible for 2% to 4% of pediatric outpatient clinic. Many researchers had shown an association between H. pylori infection and RAP. The frequency of H. pylori infection in RAP children from various studies in China, Saudi Arabia, Pakistan, Indonesia and Egypt ranged from 18.6% to 67.5%.
**Helicobacter pylori** infection is a major cause of various gastroduodenal disorders such as peptic ulcer, duodenal ulcer, adenocarcinoma of gastric and mucosa associated lymphoid tissue lymphoma (MALT lymphoma) in adulthood and autoimmune gastritis[15].

Quality of life is a term used to refer to an individual’s total well-being. This includes all emotional, social and physical aspects of an individual’s life[6]. It appears to account for 2% to 4% of all pediatric office visits. One study suggested that 13% of middle school students and 17% of high school students experience weekly abdominal pain. In the latter study, it was also noted that approximately 8% of all students had seen a physician for evaluation of abdominal pain in the previous year. Quality of life in adult patients with chronic abdominal pain is substantially poorer than that of the general population[13]. As in other chronic diseases, *H. pylori* infection in adult might sub clinically impair various mental and physical aspects of a patient’s QOL[14]. This research aimed to determine quality of life in children with RAP positive *H. pylori* infection.

**METHODS**

A cross sectional study in children with RAP was held in junior high school and senior high school in Bandung Indonesia at 2017. The subjects of this study met the inclusion criteria’s: the age ranged from 12 to 18 years old, had symptoms of RAP, and the parents agreed their children to participate in this study. Exclusion criteria were children who didn’t come during blood sample taking.

The children who fulfilled the inclusion criteria filled the informed consent to have blood sample taking and informed their parents and to be examined the serum anti *H. pylori* IgG using BioM pylori kit (local antigen of Mataram, Indonesia) that had a sensitivity of 95% and specificity of 92%[15]. The result from the examination was divided into two groups, positive and negative *H. pylori* group. The characteristic and QOL of both groups were recorded. Recurrent abdominal pain was defined as at least three separate episodes of abdominal pain that occurred in a 3-month period, severe enough to affect daily activities. The *H. pylori* infection was positive if serum IgG was positive. Quality of life were assessed by Pediatric Quality of Life (PedsQL) and defined good (PedsQL score > 70) and bad (PedsQL score ≤ 70).

**Ethics statements**

Ethical approval of this study was obtained from the Ethical Committee of Faculty of Medicine Padjadjaran University. N0: 818UN5C.10 PN2017.

**Statistical analysis**

The significant test in QOL of the two study groups used chi-square test. The criteria of significance used was p value ≤ 0.05 was considered significant statistically. The data obtained was recorded in a special form and then processed with SPSS version 21.0 for Windows.

**RESULTS**

There were 439 (17.3%) of 2,538 students accompanied by complaints of RAP, who fulfilled the inclusion criteria for 149 children, because some children did not get approval from parents, refused to take blood samples and were not present at the time of blood collection. There were 46 (30.9%) subjects with positive *H. pylori*.

We found characteristics of subjects with RAP, girls more frequent then boys with RAP, while for age, mother and father education are relatively the same for all groups, and family income is obtained most in high income groups (Table 1).

Our study showed that the relationship between characteristics RAP in children with *H. pylori* infection and RAP, there are no significant difference in sex, age, mother’s and Father’s education, economic status, bed sharing, and number of occupant (Table 2).

### Table 1 Characteristics of children with RAP.

| Variable | Total | % |
|----------|-------|---|
| **Children** | | |
| Sex | | |
| Boys | 21 | 14.1 |
| Girls | 128 | 85.9 |
| Age (years) | | |
| 12-14 | 71 | 47.4 |
| 15-18 | 78 | 52.3 |
| **Parents** | | |
| Mother’s education | | |
| Low | 50 | 33.6 |
| Middle | 59 | 39.6 |
| High | 40 | 26.8 |
| Father’s education | | |
| Low | 41 | 27.5 |
| Middle | 56 | 37.6 |
| High | 52 | 34.9 |
| Economic status | | |
| Low | 45 | 30.2 |
| Middle | 43 | 28.9 |
| High | 61 | 40.9 |

### Table 2 Relationship between RAP in Children and *H. pylori* infection.

| Characteristics | *H. pylori* infection | p value* |
|-----------------|----------------------|---------|
| **Sex** | | |
| Boys | Positive (%) 8 (38.1) | Negative (%) 13 (61.9) | 0.44 |
| Girls | 38 (29.7) | 90 (70.3) |
| **Age (years)** | | |
| 12-14 | Positive (%) 17 (23.9) | Negative (%) 54 (76.1) | 0.081 |
| 15-18 | 29 (37.2) | 49 (62.8) |
| **Mother’s education** | | |
| Low | Positive (%) 12 (24.0) | Negative (%) 38 (76.0) | 0.432 |
| Middle | 20 (33.9) | 39 (66.1) |
| High | 14 (35) | 26 (65.0) |
| **Father’s education** | | |
| Low | Positive (%) 12 (29.3) | Negative (%) 29 (70.7) | 0.767 |
| Middle | 16 (28.6) | 40 (71.4) |
| High | 18 (34.6) | 34 (65.4) |
| **Economic status** | | |
| Low | Positive (%) 15 (33.3) | Negative (%) 30 (66.7) | 0.858 |
| Middle | 12 (27.9) | 31 (72.1) |
| High | 19 (31.1) | 42 (68.9) |
| **Bed sharing** | | |
| Alone | Positive (%) 29 (31.9) | Negative (%) 62 (68.1) | 0.742 |
| Two or more | 17 (29.3) | 41 (70.7) |
| **Number of occupants** | | |
| Median | 4.5 | 5 | 0.082** |
| Rate | 3 – 7 | 2 – 14 |

*) Chi-square or Fisher exact test, **) Mann-Whitney test.

### Table 3 Relationship between *H. pylori* infection and quality of life.

| Variable | *H. pylori* infection (n=149) | p value* |
|----------|-----------------------------|---------|
| Quality of life | | |
| Bad | Positive (%) [n=46 (30.9)] | Negative (%) [n=103 (69.1)] | 0.343 |
| Good | 15 (26.3) | 42 (73.7) |

*) Chi-square.
In this study it was found that there is a tendency bad QOL in children infected with *H. Pylori* more than good QOL, nevertheless no significant differences among both *H. pylori*-infected and non-infected children (p = 0.343) (Table 3).

**DISCUSSION**

Recurrent abdominal pain is most often considered functional (non-organic) abdominal pain, but an organic cause is found in 5% to 10% of cases. If RAP is not associated with an anatomic, metabolic, infectious, inflammatory, or neoplastic disorder, it is considered functional (nonorganic) abdominal pain[21]. In Apley’s original study, the prevalence of recurrent abdominal pain in a population of school children was 10%. In subsequent studies from using his criteria the prevalence ranged from 11% to 45%[19]. In total, 149 children with RAP, 21 boys (14.1%) and 128 (85.9%) girls, aged 12-14 and 15-18 year(s) were enrolled. The prevalence of RAP in this study was 17.3%. This result is the same as previous research globally.

In our study, the prevalence of *H. pylori* infection in children with RAP was 30.9%. Previous studies by Etukudo OM et al, Duque X et al, Dattoli VCC et al and Jafri W have been reported *H. pylori* in children in other developing countries (17-63%)[12-20] and East Asian countries (9-11%) from Tam YH et al and Lin DB et al[21-22]. Our finding is lower than previous similar studies in Indonesia, Jakarta (54.8%) and Bandung (56.4%) by Soelaeman EJ et al and Prasetyo D et al[23,24].

The gender of boys found to be more infected with *H. pylori*, gender of the children showed no significant difference with *H. pylori* infection. *Helicobacter pylori* infection in the 15-18 age group was higher than the 12-14 year age group, but there was no statistically significant difference. These finding in gender and age are in line with study conducted from Mahmud S et al[8]. In other studies from Dattoli VCC et al and Jafri W et al, different results showed that children infected with *H. pylori* were significantly associated with increasing age. The reasoning about age was associated with *H. pylori* infection, still unknown, that was show in the studies conducted by Dottali VCC et al and Jafri W et al[19,20].

We demonstrated the educational status of parents no significant difference in children with *H. pylori* infection, similar reported by Awuku YA et al[23]. Socioeconomic status of a family has been no implicated as a risk factor for higher incidence of HP infections, different from those in previous studies from Mahmud S et al[8].

Bed sharing and number of occupants no significant differences among both *H. pylori* infected and non-infected children. In the present study shows that different with previous research sharing a bed or bedroom with an infected sibling in early childhood increases significantly the risk of childhood *H. pylori* infection. Crowding in households and increasing household contact have been linked as risk factors of *H. pylori* infection. This provides evidence from Awuku YA et al and Farrell S et al to support horizontal transmission of *H. pylori* among siblings[21,22].

Recurrent abdominal pain is associated with school absences. The abdominal pain is commonly associated with other symptoms, including headaches, recurrent limb pains, pallor, and vomiting and can continue into adulthood. Recurrent abdominal pain can cause significant anxiety in parents and carers found in a study from Abbott RA[23].

Research on quality of life in children with recurrent abdominal pain caused by *H. Pylori* is still rare. Some studies by Buzas GM and Moayyedi P et al have suggested that *H. pylori* impacts quality of life in patients with dyspepsia and peptic ulcer disease[24,25]. Our findings indicate that there is a tendency for bad quality of life in children infected with *H. pylori* to be more than good quality of life, but there is no significant relationship in quality of life between RAP children with positive and negative *H. pylori* infections. Based on research in adults from Taguchi H et al *H. pylori* infections might impair patient’s quality of life and the eradication of *H. pylori* improved the QOL[14-5] and successful *H. pylori* eradication improved the QOL of patients with functional dyspepsia, in particular *H. pylori*-positive patients with ulcer-like functional dyspepsia or dysmotility-like functional dyspepsia shows by study from Suzuki H et al[89].

In conclusion, our study found there was a tendency bad QOL in children infected with *H. Pylori* more than good QOL, nevertheless no significant differences among both *H. pylori*-infected and non-infected children

**ACKNOWLEDGMENTS**

We want to thank to all participant and Professor Kusnandi Rusmil MD, PhD. This work was funding by an Academic Leadership Grant (ALG) from Padjadjaran University. Professor Kusnandi Rusmil MD is the recipient of ALG from Padjadjaran University.

**REFERENCES**

1. Korkertik JJ, Diederen K, Benninga MA, Tabbers MM. Epidemiology of pediatric functional abdominal pain disorders: a meta-analysis. *PLoS ONE.* 2015; 10(5): e0126982. [PMID: 25992621]; [DOI: 10.1371/journal.pone.0126982]
2. Reust CE, Williams A. Recurrent abdominal pain in children. *Am Fam Physician.* 2018; 97(12): 785-793. Available from https://www.aafp.org/2018/0615/p785.html.
3. Di Lorenzo C, Colletti RB, Lehman HP, Boyle JT, Gerson WT, Hyams JS, Squires RH, Walker LS. Chronic abdominal pain in children: A clinical report of the American Academy of Pediatrics and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. *JPIV.* 2005; 40(3): 245-248. [PMID: 15735473]; [DOI: 10.1097/01.mpg.0000155367.44628.21]
4. Devanarayana NM, Rajindrajith S, Benninga MA. Quality of life and health care consultation in 13 to 18 year olds with abdominal pain predominant functional gastrointestinal diseases. *BMC Gastroenterol.* 2014; 14: 150. [PMID: 25145589]; [DOI: 10.1186/1471-230X-14-150]
5. Pace F, Zuan G, Di Giacomo S, Molteni P, Casini V, Fontana M, Porro GB. Family history of irritable bowel syndrome is the major determinant of persistent abdominal complaints in young adults with a history of pediatric recurrent abdominal pain. *World J Gastroenterol.* 2006; 12 (24): 3874-3877. [PMID: 16804973]; [DOI: 10.3748/wjg.v12.i24.3874]
6. Abu-Zekry MA, Hashem MES, Ali AA, Mohamed IS. Frequency of Helicobacter pylori infection among Egyptian children presenting with gastrointestinal manifestations. *J Egypt Public Health Assoc.* 2013; 88: 74-78. [PMID: 23963085]; [DOI: 10.1097/01.epx.0000430598.09388.0e]
7. Shu X, Ping M, Yin G, Jiang M. Investigation of Helicobacter pylori infection among symptomatic children in Hanzhou from 2007 to 2014: a retrospective study with 12,796 cases. *Peer J.* 2017; 5: 1-13. [PMID: 28168109]; [DOI: 10.7717/peerj.2937]
8. Telmesani AMA. Helicobacter pylori prevalence and relationship with abdominal pain in school children in Makkah City, Western Saudi Arabia. *Saudi J Gastroenterol.* 2009; 15(2): 100-103. [PMID: 19568573]; [DOI: 10.4103/1319-3767.45359]
9. Mahmud S, Shah SAUH, Ali S. Frequency of Helicobacter pylori (hp) infection in children with recurrent abdominal pain (rap). *Pak Armed Forces Med J.* 2015; 65(3): 358-362. Cited 2019-09-24. Available from: https://www.pafmj.org/index.php/PAFMJ/article/
10. Soelaeman EJ, Purnomo B, Merati SW, Soehardjo HN, Digdowirogo HS (2016) Infeksi Helicobacter pylori di RSAB Harapan Kita. Sari Pediatri 2016; 5 (4): 178-180. Cited 2019-08-26. Available from: https://saripediatri.org/index.php/sari-pediatri/article/view/917/850 [Article in Indonesia]

11. Prasetyo D, Garna H, Firmanasyah A, Idradini P. Scoring system for Helicobacter pylori infection in children with recurrent abdominal pain. J Indonesian Med Assoc. 2013; 62 (8): 295-300 [Article in Indonesia]

12. Ali AM, Elkhatif WB. Potential complications of Helicobacter pylori infection in children of a non-urban community. Arch Pediatr Infect Dis. 2015; 3(2): e23510 1-6. [DOI: 10.5812/pedinfect.23510]

13. Pacifico L, Anancia C, Osborn JF, Ferraro F, Chiesa C. Consequences of Helicobacter pylori infection in children. World J Gastroenterol. 2010; 16(41): 5181-5194. [PMID: 2049552]; [DOI: 10.3748/wjg.v16.i41.5181]

14. Taguchi H, Kanmura S, Maeda T, Iwaya H, Arima A, Sasaki H. Research report: examination of the role played by intrafamilial bed sharing. Pediatr Infect Dis J. 2005; 24(2): 149-152. [PMID: 15702044]; [DOI: 10.1097/MD.00000000000001922]

15. Muttanin Z, Gunawan S, Soemohardjo S. Serum antibody for Helicobacter pylori (ICT) antibodies using local antigens. Mataram: Mataram Hospital Biomedical Research Unit. 2004 [Article in Indonesia]

16. Pfunkett A, Beattie RM. Recurrent abdominal pain in childhood. J R Soc Med. 2005; 98(3): 101-106. [PMID: 15738551]; [DOI: 10.1258/jrsm.98.3.101]

17. Etukudo OM, Ikpeme EE, Ekanem EE. Seroepidemiology of Helicobacter pylori infection among children seen in a tertiary hospital in Uyo, southern Nigeria. Pan Afr Med J. 2012; 12(39): 1-9 [PMID: 22891097]

18. Duque X, Vilchis J, Mera R, Trejo-Valdivia B, Goodman KJ, Mendoza ME, Navarro F, Roque V, Moran S, Torres J, Correa P. Natural history of Helicobacter pylori infection in Mexican schoolchildren: incidence and spontaneous clearance. JPGN. 2012; 55(2): 209-216. [PMID: 22227999]; [DOI: 10.1097/MPG.0b013e3182488777]

19. Dattoli VCC, Veiga RV, da Cunha SS, Pontes-de-Carvalho LC, Barreto MCL, Alcantara-Neves NM. Seroprevalence and potential risk factors for Helicobacter pylori infection in Brazilian children. Helicobacter. 2010; 15(4): 273-278. [PMID: 20633188]; [DOI: 10.1111/j.1523-5378.2010.00766.x]

20. Jafri W, Yakoob J, Abid S, Siddiqui S, Nizami SASQ. Helicobacter pylori infection in children: population-based age-specific prevalence and risk factors in a developing country. Acta Paediatr. 2010; 99(2): 279-282. [PMID: 19839955]; [DOI: 10.1111/j.1651-2227.2009.01542.x]

21. Tam YH, Yeung CK, Lee KH, Sihoe JD, Chan KW, Cheung ST, Mou JW. A population based study of Helicobacter pylori infection in Chinese children resident in Hong Kong: prevalence and potential risk factors. Helicobacter. 2008; 13(3): 219-224. [PMID: 18466397]; [DOI: 10.1111/j.1523-5378.2008.00603.x]

22. Lin DB, Lin JB, Chen CY, Chen SC, Chen WK. Seroprevalence of Helicobacter pylori infection among schoolchildren and teachers in Taiwan. Helicobacter. 2007; 12: 258-264. [PMID: 17493007]; [DOI: 10.1111/j.1523-5378.2007.00496.x]

23. Awuku YA, Simpong DL, Alhassan IK, Tuoyire DA, Afaa T, Adu P. Prevalence of Helicobacter pylori infection among children living in a rural setting in Sub-Saharan Africa. BMC Public Health. 2017; 17(1): 360: 1-6. [PMID: 28438158]; [DOI: 10.1186/s12889-017-4274-z]

24. Farrell S, Doherty GM, Millichen I, Shield MD, McCallion WA. Risk factors for Helicobacter pylori infection in children: an examination of the role played by intrafamilial bed sharing. Pediatr Infect Dis J. 2005; 24(2): 149-152. [PMID: 15702044]; [DOI: 10.1097/MD.00000000000001922]

25. Abbott RA, Martin AE, Newlove-Delgado TV, Bethel A, Wheat RS, Thompson Coon J, Logan S. Recurrent Abdominal Pain in Children. JPGN. 2018; 67(1): 23-33. [DOI: 10.1097/MPG.0000000000001922]

26. Buzás GM. Quality of life in patients with functional dyspepsia: short- and long-term effect of Helicobacter pylori eradication with pantoprazole, amoxicillin, and clarithromycin or ciprofloxacin therapy: a prospective, parallel-group study. Curr Ther Res Clin Exp. 2006; 67(5): 305-320. [PMID: 24678104]; [DOI: 10.1016/j.curtheres.2006.11.001]

27. Moayyedi P, Feltbower R, Brown J, Mason S, Mason J, Nathan J, Richards IDG, Dowell AC, Axon ATR. Effect of population screening and treatment for Helicobacter pylori on dyspepsia and quality of life in the community: a randomised controlled trial. Lancet. 2000; 355(9196): 1665-1669. [PMID: 10905240]; [DOI: 10.1016/S0140-6736(00)02236-4]

28. Suzuki H, Masaoka T, Sakai G, Ishii H, Hibi T. Improvement of gastrointestinal quality of life scores in cases of helicobacter pylori-positive functional dyspepsia after successful eradication therapy. J gastroenterol hepatol. 2005; 20(11): 1652-1660. [PMID: 16246181]; [DOI: 10.1111/j.1440-1746.2005.04039.x]