

Effect of lansoprazole on quality of life in adolescents with recurrent abdominal pain

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Abstract

Background Recurrent abdominal pain (RAP) is one of the most common complaints in adolescents. Treatment for RAP depends on the etiology. Lansoprazole has been shown to be effective on gastroesophageal reflux disease (GERD), but further study is needed to assess the effects of lansoprazole on RAP.

Objective To assess quality of life (QoL) of RAP patients who received lansoprazole compared to placebo treatment.

Methods This randomized, clinical trial was conducted in the Secanggang District, Langkat Regency, North Sumatera, from August to October 2009. Patients who met the Apley criteria for RAP diagnosis were enrolled in the study. Subjects were divided into two groups: those who received 30 mg lansoprazole daily and those who received placebo, for 14 days. Quality of life was assessed using the Pediatrics Quality of Life (PedsQL) version 4.0 before administration of lansoprazole/placebo and reassessed 30 days after treatment. Efficacy of treatment was assessed by comparing the QoL before and after treatment in the two groups.

Results A total of 98 adolescents, aged 12 – 18 years, were enrolled in the study and divided into two groups: lansoprazole and placebo. There was no significant difference QoL in physical health (mean differences 95%CI -109.19 to 1.02; $P=0.054$), emotional health (mean differences 95%CI -29.26 to 45.48; $P=0.666$), social functioning (mean differences 95%CI -42.91 to 31.69; $P=0.766$), and school functioning (mean differences 95%CI -56.97 to 24.32; $P=0.430$), before and after treatment in the two groups.

Conclusion There is no significant difference in QoL between the two groups of adolescents with RAP before and after lansoprazole treatment. [*Paediatr Indones.* 2013;53:99-103.].

Keywords: Recurrent abdominal pain, quality of life, lansoprazole

Recurrent abdominal pain has been defined in the pediatric literature as at least 3 episodes of abdominal pain occurring over a period of at least 3 months that are severe enough to affect the activities of the child.¹ Recurrent abdominal pain is common, affecting 7 - 25% of school-aged children and adolescents, and more common in girls.²

Recurrent abdominal pain often interferes with activities of daily living, including school, social functioning, physical activity, as well as family responsibilities and relationships.³ The treatment of RAP is usually directed toward symptom improvement and restoration of good quality of life. Nonetheless, many therapies from placebo to drugs to psychological intervention have been associated with symptom improvement. Recurrent abdominal pain is often treated with acid-reducing medications, such as H₂-receptor antagonists and proton pump inhibitors. Lansoprazole has been reported to have better efficacy than H₂-receptor inhibitors in reducing gastric acid

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secretion and in the treatment of gastrointestinal ulcers and esophagitis in some studies.^{4,6} However, few studies have reported on the use of lansoprazole for RAP treatment. Several studies have reported that children with RAP have reduced quality of life, sleep disorders, decreased academic achievement, significantly increased number of school absences and require child health services.⁷ This study was designed to assess differences in quality of life (QoL) in RAP patients before and after lansoprazole treatment.

Methods

We conducted a double-blind randomized trial from August to October 2009, at five junior/senior high schools in the Langkat Regency. Subjects were adolescents with a history of abdominal pain. Our inclusion criteria were adolescents aged 12 to 18 years, who met the diagnostic criteria for RAP (Apley's criteria), and had good nutritional status. We excluded patients who used other medications for abdominal pain, and those with malnutrition, chronic diarrhea, constipation, bloody stools, urinary tract infection, anemia, parasitic infection, or dysmenorrhea.

We divided subjects into two groups of 49 each by simple randomization. Group I received 30 mg of lansoprazole once daily in the morning for fourteen days. Group II received placebo in the same manner.

All subjects filled the *PedsQL™ 4.0 (Pediatric quality of Life inventory™ Version 4.0)* questionnaire. The 23-item *PedsQL™ 4.0 Generic Core Scales encompass*: 1) physical functioning (8 items), 2) emotional functioning (5 items), 3) social functioning (5 items), and 4) school functioning (5 items). The instrument took approximately 5 minutes to complete. A 5-point response scale was utilized in the child's self-report for ages 8–18 years. The parent proxy-report utilizes a 4-point scale (0 = never a problem; 1 = almost never a problem; 2 = sometimes a problem; 3 = often a problem; 4 = almost always a problem). To further ease the use for young children's self-report (ages 5–7 years), the response scale was reworded and simplified into a 3-point scale (0 = not at all a problem; 2 = sometimes a problem; 3 = a big problem), with each response choice anchored to a happy-to-sad faces scale. Items were reverse-scored and linearly

transformed to a 0–100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0), so that higher scores indicated better health-related quality of life (HRQOL). Scale scores were computed as the sum of the items divided by the number of items answered (this method limits the effects of missing data). If more than 50% of the items in the scale were missing though, the scale score was not computed.⁸ Quality of life was assessed twice, before starting the medication and 30 days after.

Anthropometric measurements were made at the beginning of the study. Weight was measured using *Camry®* scales (sensitivity 0.1 kg) and height was measured using a stature meter 2M (sensitivity 0.5 cm). Nutritional status was defined by body weight (BW) per body height (BH) (%) and plotted on the Centers for Disease Control and Prevention (CDC) growth charts 2000. Obesity was defined as BW/BH > 120%, overweight for BW/BH 110% - 120%, good nutritional status for BW/BH 90% - < 110%, underweight for BW/BH 70% - < 90% and poor nutritional status for BW/BH < 70%. We performed physical and laboratory examinations.

Both lansoprazole and placebo were packed in capsules of similar color and shape. Researchers and patients did not know which drugs were given. If abdominal pain continued, patients were allowed to take 500 mg paracetamol every 8 hours. Subjects and parents provided written, informed consent before the study began. This study was approved by the Research Ethics Committee of the University of North Sumatera Medical School.

T-test was used for the *PedsQL™ 4.0* questionnaire data analysis. P values < 0.05 were considered to be statistically significant with 95% confidence interval. The study design was intention-to-treat. The collected data was processed, analyzed and presented with the *Statistical Package for the Social Sciences (Windows version 15.0; SPSS Inc, Chicago)*.

Results

From the 548 students surveyed, 240 had RAP (43.79%). Of these, 101 students did not meet the inclusion criteria and 41 refused to participate, leaving 98 subjects in our study, consisting of 50 males (51%) and 48 females (49%). There were 49 subjects in each group, receiving either lansoprazole or placebo. After

three months of follow up, no subjects dropped out of either group (Figure 1).

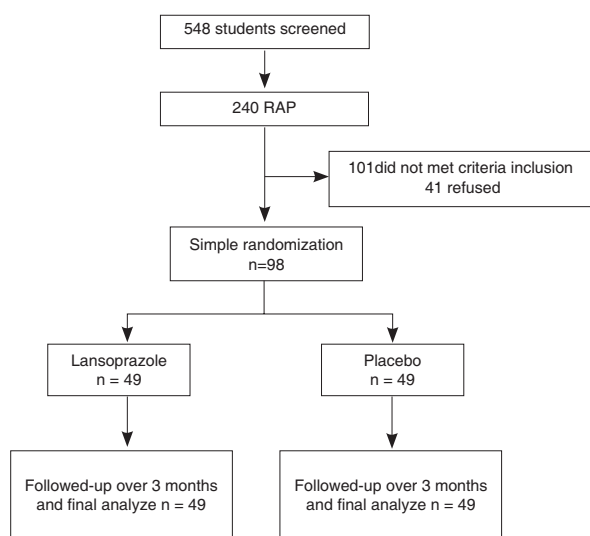


Figure 1. Study profile

There were more males than females in the lansoprazole group, but the opposite was true of the placebo group. Most subjects were in the normoweight range. The quality of life before administration of lansoprazole and placebo were similar in both groups (Table 1).

As shown in Table 2, there was no significant QoL differences between groups after administration of lansoprazole or placebo for 14 days.

Discussion

In the Langkat Regency, the site of our study, we noted that the prevalence of RAP was high (43.79%). Subjects' mean ages were 13.1 (SD 0.86) years in the lansoprazole group and 14.1 (SD 1.58) years in the placebo group. The highest prevalence of symptoms

Table 1. Baseline characteristics of subjects

Characteristics	Lansoprazole n=49	Placebo n=49
Mean age (SD), years	13.1 (0.86)	14.1 (1.58)
Sex, n (%)		
Male	28 (57)	22 (45)
Female	21 (43)	27 (55)
Mean body weight (SD), kg	38.6 (7.46)	40.0 (6.16)
Mean body height (SD), cm	147.0 (7.92)	148.4 (7.87)
Nutritional status, n (%)		
Obese	1 (2)	2 (4)
Overweight	8 (16)	2 (4)
Normoweight	30 (61)	38 (78)
Mild malnutrition	6 (13)	7 (14)
Moderate malnutrition	4 (8)	0 (0)
Mean QoL at study onset (SD), score		
Physical health	578.5 (169.79)	668.8 (119.74)
Emotional health	371.9 (100.21)	363.2 (95.48)
Social functioning	392.8 (93.96)	395.4 (87.3)
School functioning	357.6 (109.24)	382.9 (111.83)

Table 2. The quality of life difference in subjects after treatment

Quality of life parameters	Quality of Life		95% CI Mean differences	P value
	Lansoprazole (n=49)	Placebo (n=49)		
Mean physical health (SD), score	615.3 (139.99)	669.3 (128.92)	-109.19 to 1.02	0.054
Mean emotional health (SD), score	392.8 (96.55)	371.9 (89.94)	-29.26 to 45.48	0.666
Mean social functioning (SD), score	386.7 (97.78)	392.3 (87.98)	-42.91 to 31.69	0.766
Mean school functioning (SD), score	380.1 (104.08)	396.4 (98.56)	-56.97 to 24.32	0.430

of RAP in other studies occurred in children aged 4 - 6 years and 7 - 12 years.⁵ In contrast, another study demonstrated a progressive rise in RAP symptoms in children below 12 up to 15 years of age.⁶ An American study involving 507 adolescents had average ages of 12.6 years for junior high students and 15.6 years for high school students, where abdominal pain was experienced by 13 - 17% of students and interfered with activities in 21% of the adolescents.⁷

In our study, RAP was more frequently observed in adolescent boys (51%) than in adolescent girls (49%). Similar incidences between girls and boys have been reported in those up to age 9 years.⁷ After 9 years of age, the incidence of RAP increased in girls, at a reported male : female ratio of 1:1.5.^{3,9,10}

Quality of life parameters were not significantly different between the lansoprazole and placebo treatment groups. It was unclear whether quality of life did not, in fact, improve, or whether improvement occurred, but was not detected in the lansoprazole treatment group. Other studies have found the *PedsQL*[™] to be sensitive to treatment effects in clinical populations, so it was unlikely that a lack of responsiveness in the measure could account for the present findings.¹¹⁻¹³ Other factors, such as the inclusion of a community rather than a referred sample, or the moderately high quality of life scores at baseline, may have accounted for the lack of change in quality of life scores.¹⁴

We revealed that children with RAP have lower QoL of emotional health, social functioning, and school functioning than of children without RAP. The complex interaction of physiological, psychological, and social factors known to play a role in RAP may contribute to their lower QoL scores. Quality of life and functional impairment are important outcome dimensions that have been neglected in pediatric pain intervention trials. Moreover, QoL interventions may result in improved cost-effectiveness, accessibility, and patient satisfaction, thus potentially contributing to comprehensive treatment programs.¹⁵⁻¹⁷ Very few studies have been done so far to evaluate the impact of RAP on the education of affected children. Some studies have shown that the majority of children with RAP do not attend schools regularly, and school absenteeism is significantly higher among these children.¹⁸⁻²¹ Even though the general consensus regarding RAP is that it is most common among

high academic achievers, research data has failed to show any association between RAP and school academic performance or the child's participation in sports.^{22,23}

Lansoprazole, which is lipophilic, is a class of proton pump inhibitors (PPI) with a substituted benzimidazole. It can penetrate membrane and enter into canaliculus parietal cells. Under highly acidic conditions, the PPI will be activated to form covalent bonds with H⁺, K⁺-adenosine triphosphatase that inhibit acid secretion by parietal cells.^{7,24-27} Lansoprazole was reported to have better efficacy than H₂-receptor inhibitors in reducing gastric acid secretion as well as in the treatment of gastrointestinal ulcers and esophagitis in some studies,^{7,28,29} but there have been few studies on the use of lansoprazole for RAP.

A limitation in our study was that the RAP diagnostic criteria using Apley's criteria are often considered too broad in assessing specific disorders of RAP. The use of Rome criteria provides clearer operational limits, but it has limited use in research. In addition, parents' perceptions were not measured and the disparity in QoL assessments between parents and their children may be a factor in the psychosocial genesis of the disease process. Prospective epidemiologic studies focusing on the true prevalence of RAP in childhood and its effect on QoL, including psychological profiles, need to be performed.

In conclusion, lansoprazole treatment at 30 mg / day for 14 days in adolescents with RAP shows no significant difference in quality of life compared to placebo.

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