

# AN ASSOCIATION OF PSYCHOSOCIAL CHARACTERISTICS AND SEVERITY OF ULCERS IN ADOLESCENTS WITH CHRONIC PEPTIC ULCER DISEASE

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*The purpose of the study was to analyze various psychosocial characteristics and to examine their association with the severity of ulcers in adolescents with chronic peptic ulcer. A cross-sectional descriptive study, using interview questionnaires and psychological tests was conducted in 214 adolescents diagnosed with chronic peptic ulcer at 03 central hospitals in Hanoi. The results showed that adolescents with peptic ulcer often had neurotic personality traits (83.1%), had a habit of staying up late after 12 pm (21%), irregular eating (48.1%), and smoked e-cigarettes (18.2%). The majority of the study subjects had psychological trauma (92.1%). The rate of adolescents with peptic ulcer disease suffering from stress, anxiety and depression accounted for 63.6%, 47.2% and 52.8% respectively. Multivariate regression analysis showed that factors including age, s gender, family with separated/divorced parents, conflict with parents, combination of many psychological traumas, sleeping late after 11 pm, irregular eating are factors that increase the risk of peptic ulcer.*

**Keywords:** psychosocial, peptic ulcer, adolescent.

## I. INTRODUCTION

The prevalence of peptic ulcer disease in children is estimated at 5.4 – 22.4% and concentrated mainly in adolescents.<sup>1,2</sup> Defined by the United Nations as adolescents between the ages of 10 and 19, there are 3 stages - early stage (10 – 13 years), middle stage (14 – 16 years) and final stage (17 – 19 years). Adolescents has numerous physiological changes and emotional problems such as increased stress, anxiety and depression.<sup>3</sup> Since the discovery of *Helicobacter pylori* (*H. pylori*), the link between chronic peptic ulcer disease and mood and anxiety disorders has been largely disregarded. Evidence of this link comes from three main sources. First, data from several studies found the role of

psychosocial and emotional factors related to delayed healing of peptic ulcers through the mechanism of reducing blood flow to the mucosa gastrointestinal tract and increase gastric acid secretion.<sup>4,5</sup> Second, patients with anxiety and mood disorders have significantly high rates of gastrointestinal problems than the general population. Third, some studies have demonstrated an association between peptic ulcer disease and psychosocial, behavioral and infectious factors.<sup>4</sup> Bad habits such as irregular eating, staying up late, smoking, using stimulants such as alcohol, beer are thought to be etiologic factors for the development of peptic ulcer disease.<sup>5,6</sup> During adulthood, children often faced with stressful events, which can become psychological traumas leading to changes in their lives, especially during adolescence. Common psychological traumas are conflicts between children and parents, separation/divorce of parents, serious illness or death of family members or the child

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himself.<sup>3</sup> The relationship between life trauma and chronic peptic ulcer disease has also been reported in many studies.<sup>4,7,8</sup> In Vietnam, there have been many studies on peptic ulcers and *H. pylori* and non-steroidal anti-inflammatory drugs (NSADs). However, studies focused on the psychosocial domain in children with peptic ulcer disease are very sparse. Therefore, this study may add some knowledge to whether there is a link between stress and peptic ulcer in Vietnamese adolescents. The aim of this study was to describe psychosocial characteristics and investigate the relationship between psychosocial characteristics and the severity of ulcers in adolescents with chronic peptic ulcer disease.

## II. METHODS

### 1. Study population

This was a cross-sectional study conducted in 214 children aged 10 – 19 years (29 children at Bach Mai Hospital, 173 children at the National Children's Hospital and 12 children at Hanoi Medical University Hospital). Children were diagnosed with chronic peptic ulcer disease by esophagogastroduodenoscopy, *H. pylori* status was determined by rapid urease test. Children who did not consent to participate in the study or had a history of previous psychiatric disorders were excluded from the study.

### 2. Research instruments

Research question set; DASS-21 (Depression, Anxiety, Stress Scale-21) consists of 21 questions, including 3 issues: depression (7 questions), anxiety (7 questions) and stress (7 questions), the study subjects gave the answers about the state they felt within Last 1 week with 4 ratings: 0 - "This does not happen to me at all"; 1 - "This happens to me somewhat, or occasionally"; 2 - "This often happens to me, or many times"; 3 - "This happens very often, or

most of the time". The degree of disturbances was assessed by multiplying the total score of each issue twice (since this is a shortened version of the original 42 sentences). The total score ranges from 0 to 42 points corresponding to the level of each problem. Assessment results are classified into normal level and 4 levels of disturbance: mild, moderate, severe, and very severe. This scale was translated into Vietnamese by Thach Tran Duc and et al (2013), evaluated for sensitivity and specificity with the threshold for determining depression = 10, anxiety = 8 and stress = 14, Cronbach's alpha = 0.88 and has been widely used in stress, anxiety, and depression surveys; Eysenck Personality Inventory (EPI) to assess personality structure. According to Eysenck, personality structure has two main factors: extroversion - introversion (factor I) and neurotic - stable (N factor).<sup>9</sup> The test table consists of 57 questions (Appendix 3), answered "True" or "Not true", in which there are 24 questions about factor I, 24 questions about factor N and 9 questions testing the reliability of the test of the answers (S).<sup>10</sup>

**Sampling:** Convenient sampling; selecting patients aged 10 – 19 years who met the criteria for patient selection in 2019.

#### **Data processing**

Using statistical software SPSS 20.0 to analyze data to find OR, 95%CI, p, logistic regression coefficient to determine the relationship between problems.

### 3. Research ethics

Research subjects were informed and voluntarily participated in the study. Children were interviewed using a set of questions and psychological scales, without activities that interfered with the child's body. The information collected will be kept confidential and provided for research purposes. The study was approved by the Medical Ethics Committee of the National Children's Hospital.

### III. RESULTS

**Table 1. General characteristics of the study subjects**

	Characteristics (n = 214)	n	%
Age group	10 – 13 years	159	74.3
	14 – 19 years	55	25.7
Sex	Girl	96	44.9
	Boy	118	55.1
Habitat	City	148	69.2
	Countryside	66	30.8
Parents' marital status	Normal	182	85.0
	Divorce/separation	32	15.0
<i>H. pylori</i> infection	Negative	21	21.6
	Positive	76	78.4
Gastroduodenal injury	Non-ulcer chronic inflammation	117	54.7
	Chronic inflammation with ulcers	97	45.3

The mean age of the study group was 12.4 ± 1.9 years (10 – 19).

**Table 2. Psychological characteristics of research subjects**

Psychosocial characteristics (n = 214)	Girl (n = 96)	Boy (n = 118)	Total n (%)
Living habits, n (%)			
Sleep after 11pm	29 (30.2)	67 (56.8)*	96 (44.9)
Sleep after 12pm	13 (13.5)	32 (27.1)*	45 (21.0)
Smoking e-cigarettes	6 (6.3)	33 (28.0)*	39 (18.2)
Irregular eating	33 (34.4)	70 (59.3)*	103 (48.1)
Drink tea/coffee	13 (13.5)	20 (16.9)	33 (15.4)
Psychological trauma, n (%)			
No psychological trauma	14 (14.6)	3 (2.5)	17 (7.9)
Psychological trauma	82 (85.4)	115 (97.5)*	197 (92.1)
More than 2 psychological trauma	53 (55.2)	78 (66.1)	131 (61.2)
Contents of psychological trauma, n (%)			
Worry about illness	53 (55.2)	84 (71.2)	137 (69.5)
Study pressure	51 (53.1)	68 (57.6)	119 (60.4)
Conflict with parents	17 (17.7)	41 (34.7)*	58 (29.4)

Psychosocial characteristics (n = 214)		Girl (n = 96)	Boy (n = 118)	Total n (%)
Contents of psychological trauma, n (%)				
Being bullied at school		19 (19.8)	16 (13.6)	35 (17.8)
Failure in love		22 (22.9)	26 (22.0)	48 (24.4)
Personality traits				
Neurotic	Choleric	38 (39.6)	48 (40.7)	86 (40.2)
	Melancholic	39 (40.2)	53 (44.9)	92 (42.9)
Stable	Sanguine	11 (11.5)	8 (6.8)	19 (8.9)
	Phlegmatic	8 (8.3)	9 (7.6)	17 (7.9)
Stress, anxiety, depression (DASS-21), n (%)				
Stress		57 (59.4)	79 (66.9)	136 (63.6)
Anxiety		48 (50.0)	54 (45.8)	102 (47.7)
Depression		50 (52.1)	63 (53.4)	113 (52.8)
Stress + anxiety		40 (41.7)	53 (44.9)	93 (43.5)
Stress + anxiety + depression		35 (36.5)	51 (43.2)	86 (40.2)

\*p < 0.05 comparison between men and women

Inactive living habits, psychological trauma were more common in men than in women (p < 0.05).

**Table 3. Relationship of some psychosocial factors with chronic peptic ulcer**

Risk factor	Chronic peptic ulcer	
	Univariate analysis OR (95%CI)	Multivariate analysis OR (95%CI)
14 – 19 years	3.39 (1.77 – 6.49)	6.01 (4.02 – 8.67)
Boy	4.87 (2.69 – 8.80)	6.25 (3.24 – 9.00)
Live in a city	0.535 (0.29 – 0.98)	2.01 (0.15 – 3.26)
Parents divorced/separated	2.27 (1.05 – 4.93)	1.29 (1.03 – 4.21)
Conflict with parents	4.19 (6.13 – 8.23)	2.80 (1.25 – 4.51)
Study pressure	6.5 (2.82 – 14.9)	1.42 (0.32 – 2.63)
Worry about illness	2.08 (1.12 – 3.89)	1.57 (0.15 – 3.02)
Failure in love	1.58 (0.83 – 3.02)	2.99 (0.02 – 3.45)
more than two psychological trauma	2.00 (1.09 – 3.66)	3.09 (2.30 – 5.61)
Sleep after 11pm everyday	3.97 (2.24 – 7.03)	2.15 (1.09 – 5.34)
Sleep after 12pm everyday	4.52 (2.17 – 9.36)	4.502 (1.81 – 7.62)

Risk factor	Chronic peptic ulcer	
	Univariate analysis OR (95%CI)	Multivariate analysis OR (95%CI)
Irregular eating	3.28 (1.87 – 5.76)	3.26 (2.56 – 6.63)
Drink tea/coffee everyday	2.83 (1.29 – 6.18)	1.46 (0.13 – 3.01)
Smoking e-cigarettes	2.93 (1.41 – 6.09)	0.47 (0.09 – 2.82)
Depression	5.34 (2.95 – 9.65)	3.13 (1.29 – 6.31)
Anxiety	4.39 (2.47 – 7.81)	2.89 (1.41 – 5.38)
Stress	2.85 (1.58 – 5.16)	2.97 (1.91 – 6.00)
Stress + anxiety	4.50 (2.52 – 8.02)	3.72 (2.02 – 7.83)
Stress + anxiety + depression	5.68 (3.12 – 10.32)	10.67 (5.97 – 22.63)
Neurotic personality	3.64 (2.16 – 8.35)	7.59 (3.16 – 10.23)

Through univariate and multivariate analysis, a number of risk factors for chronic peptic ulcer disease were identified, including age, gender, family problems, conflict with parents, late sleeping habits, more than 2 psychological trauma, neurotic personality, stress, anxiety, and depression.

#### IV. DISCUSSION

Adolescence is an age with numerous great changes in terms of psychosocial; these fluctuations lead to changes in children's behaviours and life habits. Unhealthy habits in adolescents included irregular eating, sleeping late, smoking, using stimulants such as alcohol, beer and drugs. Studies on the pathogenesis of diseases of the digestive system have demonstrated that smoking, alcohol consumption and NSAIDs weaken the protective mechanisms of the gastrointestinal tract, and skipping meals or Irregular eating, shift work, and short sleep duration can increase the amount of acid in the stomach and duodenum.<sup>11</sup> Our study showed that the most common non-active living habit is irregular eating, accounting for 48.1%, of which 2/3 of

the children self-reported regularly skipping breakfast due to waking up late and having to go to school early. Sleeping late is a fairly common habit, accounting for 44.9%, where 21.0% of children sleep very late after 12 pm daily. Interestingly, we note that 18.2% of children smoked e-cigarettes. Research results show that most adolescents with chronic peptic ulcer have psychological trauma during the 3 months before being interviewed, accounting for 92.1%. The most common issue recorded in the study group was upsetting about their own illness (69.5%). During the interview process, the children shared that persistent abdominal pain caused wariness and fear of stomach cancer from infection of *H. pylori* thus increased their stress level; 60.4% of adolescents reported to be under school pressure, the most common age group in our study is about 12-13 years old, this is the period when children are preparing for the entrance exam to public high schools. Children set high goals for themselves, or parents had high expectation, which weigh heavily on children. 29.4% of adolescents have conflicts with their parents, especially males. This conflict often comes from two sides, children

want to assert themselves, demand freedom less less parents's supervision, are sensitive to things that affront their independence. Parents always want to control their children, stemming from concern for children well being. Failure in love accounts for 24.4%, children begin to be interested in love, but this affection often comes from spontaneous and neurotic emotions, so there is high rate of failure. These failures greatly affect the psychology, learning and health of children. 17.8% of children in the study self-reported that they were bullied at school in many ways. Long-term cases of bullying, in addition to having a negative impact on learning, also have a huge negative impact on a child's development, both socially and psychologically. During adolescence, the personality of each individual undergoes a lot of changes, instability, related to autonomy, self-assertion in family and society. Stemming from this point of view, we used the EPI personality classification scale to survey the personality characteristics of 214 adolescents with chronic peptic ulcer disease, showing that personality traits were mostly neurotic with 2 states of concern (40.2%) and temper (42.9%). This personality trait is also quite common in adolescence, which is a detrimental factor that promotes more psychological trauma, especially conflicts with parents, friends... creating an unbalanced state of mind, difficult to control, and motivates individuals to choose emotionally focused coping strategies when dealing with different types of trauma such as academic pressure, love failure, conflict with parents...

The digestive system and the brain are closely connected through the autonomic nervous system (the Gut-Brain axis). During stress, anxiety, depression, nervous function can be disturbed by increasing the secretion

of pepsin, stomach acid and causing mucosal damage. Psychological problems can alter cortisol secretion by affecting the hypothalamic-pituitary-adrenal axis. When stressed, cortisol levels are often elevated, leading to an increase in gastric acid secretion, which can cause an imbalance in the protective factor of the gastrointestinal mucosa. In addition, negative habits such as smoking, drinking alcohol, sleeping late, drinking coffee daily are common among people with psychological problems. Therefore, to determine this association, we compared 2 groups: the chronic gastritis group with ulcerative lesions and the chronic gastritis group without ulcerative lesions by univariate analysis and multivariate logistic regression. The results show that ulcerative lesions are seen mainly in the 14 – 19 aged group, the risk of occurrence is 6 times higher than the other group. Other studies have also noted the risk of developing peptic ulcers increases with age.<sup>2,12</sup> Research by Lee YB and et al showed that the rate of men with peptic ulcer was higher than that of women.<sup>7</sup> Our study also found that the risk of developing peptic ulcer in the male group was 6.3 times higher than in the female group. Our study subjects were noted to have a lot of psychological traumas and negative habits, thus we suggest it is the basis of our findings. Adolescents living in cities have a higher risk of developing chronic gastritis with ulcers than those living in rural areas, one hypothesis is that urban children are more inactive and have unhealthy lifestyles such as staying up late, smoking and using stimulants like coffee... Haider and et al found that more than 40% of children with peptic ulcers lived in broken families.<sup>13</sup> Our study also noted that the risk of developing ulcers in this group of children was 1.3 times higher than that of children living in normal families. Egbaria and et al indicated

that subjects with peptic ulcer disease often have many negative habits such as smoking, alcoholism, skipping breakfast, sleeping late, drinking coffee daily.<sup>2</sup> Indeed, our study also found that the above negative habits appeared in the ulcer group significantly more than in the non-ulcer group and increased the risk of ulceration from 2.1 to 4.5 time. Our results are consistent with many studies around the world.<sup>13,14</sup> The association between life trauma and peptic ulcer disease has been reported in many studies, and this association was again recognized in our study, especially when children have a combination of 2 or more psychological traumas, the risk of developing ulcers is 3.9 times higher.<sup>9</sup> At the same time, we found that subjects with symptoms of stress, anxiety, and depression had a significantly higher risk of developing ulcers, especially when combining these symptoms.

## V. CONCLUSION

Various factors including the 14 – 19 aged group, male, family problems, conflict with parents, combination of 2 or more traumas, sleep late after 11pm daily, sleep very late after 12pm daily, irregular eating habits are the ones that increase the risk of developing peptic ulcer lesions in adolescents. The results show that it is necessary to screen for stress, anxiety and depression in adolescents with chronic peptic ulcer disease to detect and promptly treat these psychological disorders.

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