

Pixu syndrome grading and its relationship with D-xylose and BT-PABA absorption in 183 patients

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Abstract

AIM: To study the grading of pixu (spleen deficiency) syndrome and the scientific basis of its relationship with absorption of D-xylose and BT-PABA.

METHODS: The present study included 115 cases of chronic superficial gastritis, 15 cases of chronic atrophic gastritis, 19 cases of peptic ulcer, and 34 cases of chronic colitis. All cases were diagnosed by endoscopy and biopsies. Chronic gastrointestinal diseases were categorized into the following six types: spleen and stomach asthenia syndrome (including asthenia and cold); disharmony between liver and stomach; damp and heat of spleen and stomach (bowel) syndrome; spleen-stomach-yin deficiency; blood stasis; and spleen-kidney-yang deficiency. Grading of these syndromes were made with concomitant estimation of D-xylose and BT-PABA tests.

RESULTS: Compared with healthy controls, the patients with chronic gastrointestinal diseases showed diminished urinary level of D-xylose and of BT-PABA ($P < 0.05$), with the exception of those with damp and heat of spleen-bowel syndrome. The excretory rate of D-xylose was nearly normal, while the levels of D-xylose and BT-PABA were lower than in the healthy controls ($P < 0.05-0.01$). In regard to the grading of spleen deficiency and the disharmony between liver and stomach syndromes, the excretory rate of D-xylose decreased gradually ($P < 0.01$) as the severity of symptoms increased; in patients with disharmony between liver and stomach syndrome, the excretory rate of BT-PABA also decreased ($P < 0.01$) as symptoms worsened. These data provide scientific evidence for appraisal of the pathophysiology of these syndromes.

CONCLUSION: Changes of D-xylose can reflect the specificity

of pixu syndrome, whereas changes of BT-PABA can reflect the specificity of disharmony between liver and stomach syndrome.

Key words: Spleen asthenia; Gastrointestinal diseases; D-xylose; BT-PABA

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INTRODUCTION

Patients with pixu (spleen deficiency) syndrome have lower levels of D-xylose and BT-PABA than healthy individuals^[1]. This finding indicates that these patients have functional impairment of absorption and assimilation. Systemic studies have not been carried out to elucidate the relationship between the symptoms of pixu syndrome, disharmony between liver and stomach syndrome and the levels of D-xylose and BT-PABA. We started such an investigation in 1990 and have now achieved some new enlightenment.

MATERIALS AND METHODS

Materials

This study included 115 cases of chronic superficial gastritis, 15 cases of chronic atrophic gastritis, 19 cases of peptic ulcer, and 34 cases of chronic colitis. All cases were diagnosed by endoscopy and mucosa biopsies. Among them, 79 were males and 104 females. The ages ranged from 13-year-old to 66-year-old, with a mean age of 46-year-old. The course of illness ranged from 0.5 years to 21 years, with an average of 8.7 years.

Methods

Grading of symptoms was made according to the theory of traditional Chinese medicine, by which chronic gastrointestinal diseases were categorized into six types, namely spleen and stomach asthenia, disharmony between liver and stomach, damp and heat of spleen-stomach (bowel), spleen and stomach-yin deficiency, blood stasis, and spleen-kidney-yang deficiency. The items of differentiation were different in each syndrome, and only the significant ones were selected. High scores were given to those chronic gastrointestinal diseases with symptoms in common, such as stomach ache, poor appetite, epigastric and abdominal fullness, loose bowel movement, and constipation; the scores were 5 points for mild symptoms, 6.5

Table 1 Relationship between concentration of D-xylose and BT-PABA [mean \pm s, % (n)]

Group	D-xylose	BT-PABA
Normal	26.37 \pm 0.70 (32)	74.57 \pm 1.47 (36)
Chronic superficial gastritis	20.70 \pm 1.18 (115)	49.15 \pm 1.64 (115)
Chronic atrophic gastritis	18.33 \pm 2.67 (14)	56.35 \pm 4.84 (14)
Peptic ulcer	17.46 \pm 1.81 (19)	46.72 \pm 3.22 (19)
Chronic colitis	21.21 \pm 2.16 (34)	52.11 \pm 2.81 (34)

Table 2 Relationship between excretory rate of D-xylose and level of BT-PABA [mean \pm s, % (n)]

Group	D-xylose	BT-PABA
Normal	26.37 \pm 0.70 (32)	74.57 \pm 1.47 (36)
Disharmony between liver and stomach	19.35 \pm 1.69 (57)	48.15 \pm 2.45 (57)
Spleen and stomach (cold) asthenia	19.95 \pm 1.44 (57)	53.11 \pm 2.12 (57)
Damp and heat of spleen and stomach (bowel)	24.17 \pm 2.21 (35)	50.38 \pm 2.55 (35)
Spleen and stomach-yin deficiency	19.86 \pm 2.73 (14)	51.47 \pm 5.47 (14)
Spleen and kidney-yang deficiency	17.84 \pm 4.89 (9)	44.72 \pm 6.45 (9)
Blood stasis impeding meridians	16.57 \pm 3.26 (10)	47.70 \pm 4.48 (10)

Table 3 Relationship between various grades of spleen asthenia and the level of D-xylose or BT-PABA [mean \pm s, % (n)]

Index	Mild	Moderate	Severe
D-xylose	21.91 \pm 2.42 (16)	19.86 \pm 1.73 (49)	16.81 \pm 2.62 (15)
BT-PABA	51.22 \pm 3.09 (16)	52.75 \pm 2.56 (49)	49.78 \pm 5.10 (15)

Table 4 Relationship between grade of the main symptoms of pixu and the D-xylose excretory rate [mean \pm s, % (n)]

Main symptoms	Pixu syndrome grade		
	Mild	Moderate	Severe
Poor appetite	25.64 \pm 3.28 (8)	20.50 \pm 1.93 (34)	16.31 \pm 2.89 (11)
Epigastric fullness	22.29 \pm 3.89 (8)	20.68 \pm 2.16 (25)	19.18 \pm 3.24 (8)
Loose bowel movement	27.36 \pm 3.32 (5)	20.07 \pm 2.29 (27)	16.31 \pm 2.89 (11)
Fatigue and shortness of Qi	23.01 \pm 3.65 (7)	19.79 \pm 2.33 (28)	17.21 \pm 3.72 (8)

Table 5 Relationship between the grade of symptoms of pixu and the level of BT-PABA [mean \pm s, % (n)]

Main symptoms	Pixu syndrome grade		
	Moderate	Mild	Severe
Poor appetite	53.29 \pm 4.53 (8)	53.76 \pm 2.83 (34)	51.93 \pm 5.37 (11)
Epigastric fullness	50.60 \pm 5.22 (8)	53.81 \pm 3.74 (25)	45.39 \pm 5.60 (8)
Loose bowel movement	58.36 \pm 5.53 (5)	51.73 \pm 3.48 (27)	51.92 \pm 5.37 (11)
Fatigue and shortness of Qi	51.59 \pm 4.28 (8)	52.23 \pm 3.42 (28)	49.21 \pm 6.81 (8)

points for moderate symptoms and 8 points for severe symptoms, with 10 points given for signs of tongue and pulse concord with each syndrome. Cases that were difficult to differentiate were excluded from the analysis.

Measurement of D-xylose was made by Jin's modified method^[2]. BT-PATA was measured by Zhou's method^[3].

RESULTS

The urinary levels of D-xylose and BT-PABA in chronic gastrointestinal diseases were lower than those in normal controls (Table 1).

Except in the damp and heat of spleen and stomach (bowel) group, the level of D-xylose was close to normal; the levels of D-xylose and BT-PABA in other syndromes were all significantly lower than normal (Table 2). Symptoms of spleen asthenia consist of spleen and stomach-yin deficiency and spleen and kidney-yang deficiency. The excretory rate of D-xylose decreased as the symptoms worsened; nevertheless, the level of BT-PABA showed no statistically significant changes (Table 3).

The main symptoms of patients with spleen asthenia were poor appetite, epigastric fullness, loose bowel movement, fatigue and shortness of Qi. The D-xylose excretory rate was lower than normal (26.37% \pm 0.70%; Table 1). The D-xylose excretory rate decreased gradually as the severity of symptoms increased. The level of BT-PABA was also lower than normal (74.57% \pm 1.47%; Table 1). However, there was no significant change in the relationship between the severity of symptoms and the level of BT-PABA (Tables 4 and 5).

DISCUSSION

Our study showed that patients with pixu had functional impairment in absorption and assimilation. The urinary levels of D-xylose and BT-PATA of chronic gastrointestinal diseases were lower than those of normal controls. By employing the theory of traditional Chinese medicine, we found that the urinary level of D-xylose in damp and heat syndrome of spleen and stomach (bowel) was close to that of the normal controls. After herbal treatment, the level of D-xylose in damp and heat syndrome decreased. The excretory rates of D-xylose in the other types were all increased, and those of BT-PATA were increased as well. This finding indicated that the absorptive functions of the small intestine were improved.

The symptoms of pixu were scored among three degrees: mild, moderate and severe. The excretory rate of D-xylose decreased gradually in all three, whereas the urinary level of BT-PABA did not show any remarkable changes. After herbal treatment, the level of D-xylose and that of the BT-PABA increased with improvement of symptoms. This finding indicated that herbal treatment was effective for all three degrees of pixu symptomology. In disharmony of liver and stomach syndrome, the excretory rate of D-xylose was different from that of spleen deficiency syndrome. The level of BT-PABA decreased gradually in all the degree subgroups though. After herbal treatment, the excretory rate of D-xylose decreased in mild cases but increased in moderate and severe cases, and particularly for the latter two. The above results suggested that change in D-xylose level may reflect the characteristics of spleen deficiency syndrome, whereas change in BT-PABA may reflect those of dishar-

mony between spleen and stomach syndrome. In spleen deficiency syndrome, the D-xylose level decreased gradually in accordance with the severity of symptoms, and BT-PABA showed no concordant changes; for disharmony between spleen and stomach syndrome, the reverse was true. One syndrome relates to deficiency and the other to excess, and as such the clinical manifestations vary.

In patients with chronic gastrointestinal diseases, the disharmony between liver and stomach syndrome was found to occur in early and intermediate stages, and to produce a relatively milder condition. The decrease of BT-PABA reflects diminution of pancreatic exocrine function. Spleen deficiency syndrome was found to occur in moderately advanced and advanced stages, and the patients' vitality was lowered; the pathogenic state is not too excessive and the condition is more serious, as reflected by diminution of D-xylose. This finding indicated the absorptive function of the small intestine and digestion are impaired in the late stage, when malabsorption occurs. Hence, disharmony between liver and stomach syndrome comes

first and spleen deficiency syndrome comes late. From the point of view of modern medicine, it can also be well explained that digestion occurs earlier and malabsorption of nutrients ensues subsequently.

We found that D-xylose testing can be used not only as a marker of relative specificity of pixu syndrome, but also to determine the four main symptoms of disharmony between liver and stomach syndrome. This may represent a new method for studying of syndromes in traditional Chinese medicine.

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