

Acupressure as a Method of Rehabilitation and Treatment of Patients with Gastroduodenal Pathology

Akupresura jako metoda rehabilitacji i leczenia pacjentów ze schorzeniami żołądka i dwunastnicy

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SUMMARY

Aim: To assess the effectiveness and safety of acupressure in the complex rehabilitation and treatment of patients with gastroduodenal pathology.

Materials and Methods: A retrospective analysis of the results of examination and treatment of 40 patients with gastroduodenal pathology was carried out. For treatment, the author's protocol of acupressure (AP) was used based on the recommendations of F.M. Houston. Statistical processing of the results was carried out according to the qualitative data analysis algorithm using the MedCalc 2022 software package. The frequency of occurrence of qualitative binary variables was analyzed with the calculation of 95% CI. To determine the effect of AP on the change in the frequency of clinical syndromes, the McNemar test for related groups was used. The assessment of the risk of side effects of AP was carried out on the basis of determining the significance level of 95% CI for the share, taking into account the binomial distribution of the characteristic. Formulated null and alternative statistical hypotheses.

Results: After two weeks of treatment with the using of AP against the background of the disappearance of endoscopic signs of gastroduodenal pathology, statistically significant changes in the frequency of manifestations of all clinical syndromes were detected. AP not only relieves pain, but also shortens the duration of the illness, eliminates functional disorders of the motility of the upper parts of the digestive tract, allows to achieve clinical and endoscopic recovery and provides stable and long-term remission. Tolerability of AP was good. No side effects were registered. It has been proven with a probability of 95% that the risk of a side effect does not exceed 9%.

Conclusions: Using of AP is effective, safe, which corresponds to the alternative statistical hypothesis.

Key words: acupressure, rehabilitation, gastroduodenal pathology

Słowa kluczowe: akupresura, rehabilitacja, schorzenia żołądka i dwunastnicy

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INTRODUCTION

Digestive diseases are the sixth leading cause of death in the world and accounted for 2.56 million deaths in 2019. In Ukraine, these diseases are the third of the five main causes of death of Ukrainians according to the Conclusions of the Global Burden of Disease study for 2019 [1]. Gastritis and duodenitis (23.7%), chronic cholecystitis and cholangitis (21.1%), peptic ulcer disease (13.3%) and pancreatic diseases (14.4%) have the greatest influence on the prevalence of gastroenterological pathology among the adult population in Ukraine [2]. So, in total, the pathology of the gastroduodenal zone is 37% (more than a third of cases among all pathologies of the digestive organs).

The above data emphasize the medical and social relevance of diseases of the gastrointestinal tract in general and

gastroduodenal pathology in particular, which necessitates the development and implementation of new treatment methods in practical health care aimed at improving the quality of life of this group of patients [2] and preventing disability during their treatment.

One of the powerful systems for the rehabilitation of patients should be considered reflexology, whose conceptual principles have been tested for thousands of years. It can be used at all stages of patient rehabilitation and in almost all fields of medicine [3]. The most common method of reflexology is needling (acupuncture) and cauterization. Acupressure (from the Latin *acus* – point + *pressura* – pressure) is point massage, one of the many methods of reflexology, in which a targeted therapeutic effect on the organs and tissues of the body is

carried out by mechanical stimulation of biologically active points (BAP). Acupressure (AP) works with the same points and meridians as acupuncture. Both AP and acupuncture are based on the same fundamental principle of activating acupuncture points along the meridians. The only difference between the two interventions is that AP stimulates BAP with finger pressure rather than fine needles [4].

AP, as a component of ancient Eastern medicine, known in China as finger zhen, in Japan as “shiatsu”, has justified itself over the centuries and has not lost its significance to this day [5-7]. The essence of the method consists in pressing (pressing) with the pads of the fingers on reflexogenic zones (acupressure points) that are energetically connected to various internal organs and systems. No wonder F.M. Houston figuratively called AP acupuncture without needles [6]. Under the influence of pressure at an effective point, an effect can be expected, which is similar to the effect of acupuncture [8] and in many cases is not inferior to the effectiveness of classical acupuncture [7]. Finger zhen is simpler than acupuncture [5], does not require special equipment and tools [6, 7, 9-11], does not cause pain like a needle, does not cause bleeding, and makes it impossible to introduce infection into the body when pressed with a finger [4]. AP has many advantages: it is used both independently and in combination with acupuncture, physiotherapeutic procedures, drug therapy and physical therapy. It is important to note that a well-founded and successful combination of AP with drug therapy (integrative medicine) allows in practice to significantly reduce the dose of drugs, and sometimes to abandon the use of some drugs and increase the effectiveness of treatment [3, 10, 11]. AP can also be used to provide emergency care [5-10].

In the available literature, there is no evidence base regarding the use of AP in diseases of the gastroduodenal zone. Most of the existing publications are devoted to the use of acupuncture in patients with chronic gastritis and peptic ulcer disease [5, 9]. Among domestic publications, only a few works are devoted to the use of finger zhen in the pathology of the digestive organs. In particular, it was established that the inclusion of the AP course in the complex rehabilitation of patients with chronic pancreatitis and diabetes mellitus in outpatient conditions led to a higher level of efficiency according to a number of qualitative and quantitative indicators [12].

There are many publications in the English-language literature regarding the efficacy and safety of AP, but all of them relate to the strategy of treating symptoms or syndromes, as traditional Chinese medicine uses a comprehensive approach to treating patients based on individualized treatment using the concept of “syndrome differentiation.” In 2011, a group of scientists published the results of a systematic review of 43 randomized controlled trials (between January 1, 2000 and January 31, 2010) that examined the effectiveness of acupressure for the treatment of a range of symptoms in adults with a variety of disorders and conditions: nausea and vomiting in patients during pregnancy and chemotherapy; pain in patients with dysmenorrhea, during childbirth and after trauma; shortness of breath; fatigue and insomnia. It is

concluded that AP may be a useful strategy for the treatment of many symptoms in different patient populations, but rigorous trials are needed. Including AP as an intervention can improve patient outcomes [13]. It is appropriate to note that a year ago the publication “An Effective and Feasible Alternative Treatment for Anxiety During the COVID-19 Pandemic” appeared [14]. This problem is extremely relevant today: anxiety is very widespread not only during the COVID-19 pandemic and in the post-Covid period, but also in the conditions of martial law, which the entire Ukrainian people are experiencing today. Also, anxiety can be a consequence of both somatic (in general) and gastroenterological pathology (in particular). This once again confirms the symptomatic approach to the use of AP as a non-invasive strategy for the treatment and rehabilitation of patients.

Unfortunately, today there is a significant lack of knowledge about the use of AP, despite a generally positive attitude towards its inclusion in the treatment plan [13]. To support AP as an important component of complementary and alternative medicine in the near future and expand its use, we must shed more light on the therapeutic functions of AP and implement it in medical practice [4].

AIM

To assess the effectiveness and safety of acupressure in the complex rehabilitation and treatment of patients with gastroduodenal pathology.

The task of the work was to study the effect of acupressure on the clinical course, tolerability and side effects in patients with pathology of the gastroduodenal zone. The primary endpoint of the treatment and rehabilitation period was complete absence or improvement of symptoms at the end of treatment [15-17].

MATERIALS AND METHODS

This study is based on a retrospective analysis of the results of examination and treatment of 40 outpatients for uncomplicated gastroduodenal pathology: 7 patients with chronic gastritis associated with *H. pylori*, 13 had chronic gastritis with accompanying duodenogastric reflux (biliary gastritis), and 20 patients with erosive-ulcerative lesions of the gastroduodenal zone. There were 12 (30%) men, 28 (70%) women.

The criteria for the inclusion of patients in the study were persons of mature age (from 22 to 60 years) with clinical manifestations of abdominal and/or dyspeptic syndromes of varying severity.

Patients with “worrying” symptoms, severe comorbid pathology, adolescents, persons over 60 years of age, pregnant women, patients who abused alcohol were excluded from the study. The study did not include people who underwent surgical interventions (in particular, gastric resection, cholecystectomy), that is, with so-called secondary biliary reflux.

Verification of the diagnosis was based on general clinical data, results of FEGDS with biopsy, pH-metry, determination of *H. pylori* infection, histopathological examination, ultrasound of abdominal organs, etc. During FEGDS, endoscopic signs of gastropathy were assessed, including erythema, edema,

erosions or ulcers, and the presence of bile in the stomach. The diagnosis of pathological duodenogastric reflux was established according to the criteria of Lin JK et al. (2003) at FEGDS [18].

To solve the task, the patients received a course of AP according to the scheme developed by the authors (acupressure protocol) based on the recommendations of F. M. Houston, which included both local and remote AP points (trunk, head, hands) related to the stomach and duodenum [6]. The method of AP is described in detail in the copyright patents of Ukraine and the innovation [15-17]. The duration of treatment is 10-14 days (5-7 sessions of pressure points).

In 34 (85%) patients from the total number of patients with *H. pylori* infection, AP was used in combination with a 10-day course of three-component anti-helicobacter therapy, and in 6 patients with a negative test – without medicinal combination.

AP effectiveness was assessed according to the following criteria: speed of pain relief; speed of elimination of the main clinical manifestations of dyspeptic and asthenovegetative syndrome, disappearance of endoscopic signs of biliary reflux and erosive-ulcerative changes of the mucous membrane in the control FEGDS after comprehensive treatment.

Statistical processing of the obtained observation results was carried out according to the algorithm of statistical data analysis, description and provision of qualitative variables [19-21] using the MedCalc Software Ltd, Ostend, Belgium – 2022 program package [22].

In patients, an analysis of the frequency of manifestation of a number of qualitative indicators (clinical syndromes before and after treatment, the risk of developing a side effect from the use of AP) was carried out, where the variable sign has only two values – “yes/no”, “there are side effects/absent”, etc. Such qualitative data, which are analyzed in medical research and have only two values, are called binary or dichotomous variables [19, 20].

When describing qualitative variables of the binary type, for each of its values, the absolute value was indicated, as well as the percentage share of the feature in the structure of the entire population (point estimate of the frequency of manifestation of the feature) with the calculation of the interval estimate of this value – 95% confidence interval (95% CI) or 95% CI (from English “confidence interval”) [19, 20].

To determine the effect of AP on the change in the frequency of manifestations of the main clinical syndromes, against the background of the disappearance of endoscopic signs of reflux biliary or erosive ulcerative gastropathy, the non-parametric McNemar test was used for related (dependent) observation groups, in which patients act as their own control or in studies of the type “before and after” [19-22].

The risk assessment of the side effect of AP was carried out on the basis of the determination of the significance level of 95% CI for the proportion taking into account the binomial distribution of the characteristic (“presence-absence of complication”) [21].

The use of statistical analysis made it possible to confirm or reject the decision made and to formulate statistical hypotheses.

To test statistical hypotheses, the null hypothesis H_0 was formulated [19,20]: the proposed method of rehabilitation and treatment is not effective and safe. Accordingly, the alternative hypothesis H_a , which is accepted in case of rejecting the null hypothesis, is [19,20]: the proposed method of rehabilitation and treatment is effective and safe. To test the null hypothesis, the McNemar test was used (for connected groups when describing the results of the study in paired observations – “before and after”) [19, 20, 22].

Based on the results of the examination, the committee on ethical issues and biomedical ethics of the Poltava State Medical University believes that the work meets the requirements of the Helsinki Declaration on Human Rights.

RESULTS

Clinically, three main syndromes were observed in patients with pathology of the gastroduodenal zone: manifestations of abdominal syndrome were found in 30 patients ($(75.0 \pm 6.85\%)$; 95% CI 50.6-107.1%), dyspeptic syndrome (nausea, vomiting with bile, a feeling of fullness in the stomach, heaviness in the stomach, discomfort in the epigastrium, bitterness in the mouth, belching, heartburn, bloating, decreased appetite, etc.) – in 36 patients ($(90.0 \pm 4.7\%)$; 95% CI 63, 03-124.6%), asthenovegetative syndrome (reduced working capacity, rapid fatigue, emotional instability, sleep disturbances, anxiety, etc.) – in 28 patients ($(70.0 \pm 7.2\%)$; 95% CI 46.51-101.17%).

The effectiveness of AP in patients with gastroduodenal pathology was evaluated. The frequency of manifestations of the main clinical syndromes was determined before and after the use of AP. The results of a comparison of the frequencies of binary features in two related (dependent) observation groups (the case of paired observations) using the McNemar test and exact probability (binomial distribution) are presented in Table 1.

Tolerability of AP in all patients was good. No side effect of the intervention was detected in any patient when using AP. In calculations that are based on the use of a normal sample distribution, this means that the estimate of the risk of an adverse effect, as well as the 95% CI, is equal to zero [21]. But this goes against common sense.

That is why calculations of 95% CI for the share were carried out on the basis of the binomial distribution (Figure 1) [21], which allows to assess the risk of side effects of AP.

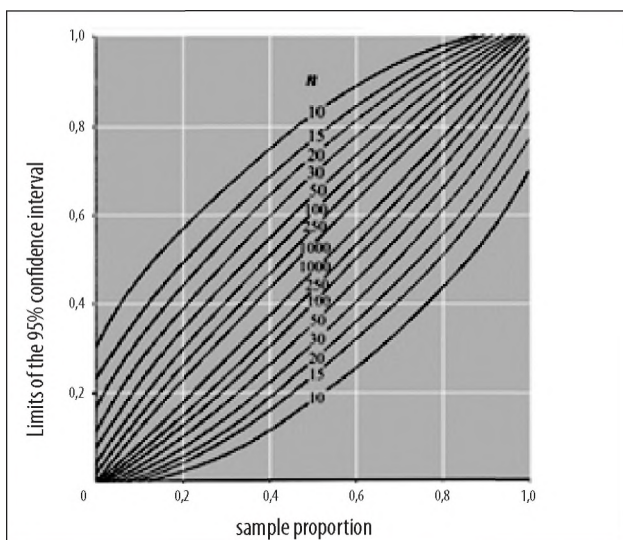
To do this, first, on the horizontal axis, it is necessary to find a point that corresponds to the sample proportion \hat{p} (in this case, zero). Then, from this point, a perpendicular should be drawn to the points of intersection with a pair of curves that correspond to the number of the sample volume. The vertical coordinates of the intersection points and are the 95% CI limits. In our case, for $n = 40$, the lower limit of CI is 0, and the upper limit is about 0.09. So, with a probability of 95%, we can say that the risk of developing a side effect from the use of AP does not exceed 9%.

DISCUSSION

AP is a non-invasive and non-pharmacological intervention for painless treatment and rehabilitation of many diseases

Table 1. Changes in the frequency of manifestations of abdominal, dyspeptic and asthenovegetative syndromes in patients with pathology of the gastroduodenal zone during treatment and the main criteria for comparison

| Stages of observation | Abdominal syndrome | | Dyspeptic syndrome | | Asthenovegetative syndrome | | totally |
|--------------------------------|-------------------------------|---------|---------------------------------|---------|---------------------------------|-----------|---------|
| | present | absent | present | absent | present | absent | |
| Before treatment, n (%) | 30 (75) | 10 (25) | 36 (90) | 4 (10) | 28 (70) | 12 (30) | 40 |
| After treatment, n (%) | 2 (5) | 38 (95) | 2 (5) | 38 (95) | 3 (7,5) | 37 (92,5) | 40 |
| McNemar criterion, % 95% CI | -70 From -84,2 to -55,8 | | -85 From -96,07 to -73,93 | | -62,5 From -77,5 to -47,5 | | |
| Significance (p) | < 0,0001 | | < 0,0001 | | < 0,0001 | | |

**Figure 1.** 95% CI for proportions calculated on the basis of the binomial distribution (S. Glanz, 1999:214-5)

[4, 6, 7, 9-14]. According to traditional Chinese medicine, acupressure uses pressure to stimulate certain acupuncture points for therapeutic purposes, and the stimulation of these points can correct imbalances between Qi channels and subsequently treat diseases. By the way, Qi permeates everything and is the vital energy of life. Rebalancing Qi achieves therapeutic benefits by improving the physiological functions of body systems or Zang-fu (the state of internal organs) [4]. Zang-fu is a combined term for human internal organs [11]. In accordance to traditional Chinese medicine, acupressure uses pressure to stimulate specific acupoints for therapeutic purposes and stimulating these points can correct imbalance between Qi through channels and subsequently treat the diseases. Qi permeates everything and it is vital energy of life. Re-equilibrium of Qi achieve therapeutic benefits by improving the physiological functions of body systems or Zang-fu in the process [4]. Zang-fu is a combined term for human internal organs [4].

It is known that the effectiveness of finger zhen depends on the ability to find AP points on the body, their skillful combination with each other, as well as the choice of technique

and method of exposure. Correct diagnosis and selection of the appropriate acupuncture point is the most important task of AP [4]. It is appropriate to mention that the acupuncture point is the point closest to the surface of the skin, and the activation of the acupuncture point is the main stage of AP [4]. It is important to note that each acupuncture point is recognized as having a specific therapeutic effect, but a combination of acupuncture points is often stimulated to produce a therapeutic effect [23]. And the optimal combination of the most effective vital points of the AP allows to correctly eliminate various disorders of the body's functions [5, 7, 11].

As noted by Mehta P et al., the selection and activation of a specific AP point and the pressure to activate it are extremely important: high-intensity pressure can damage any part of the body, while low-intensity pressure may not be effective in relieving pain [4]. The intensity of pressing should gradually increase from light to moderate with the desired appearance of predicted sensations (similar to acupuncture), which are extremely important both for control of the intervention and for a successful therapeutic effect [5, 6, 11]. It should be remembered that these feelings do not occur in all patients. In 10% of cases, they are absent, and therefore the intervention is somewhat complicated.

If the predicted sensations appear, then they are present when pressing on all points of the AP protocol. This is an important psychological factor for the doctor, while it has a psychotherapeutic effect for the patient. It is the presence of predicted sensations that is the key to achieving a quick therapeutic effect from pressing AP points.

Therefore, from a practical point of view, the first AP session is extremely important, as it allows for a preliminary assessment of the patient's reaction to the pressure of strictly defined BAP. As a rule, already after the first AP session in most patients, abdominal pain first disappeared and the main manifestations of dyspeptic syndrome decreased. A simple finger press on the BAP of the AP protocol not only relieves pain during the first 15-30 minutes of the intervention, but also significantly improves the well-being of patients and improves their quality of life. In the future, in order to consolidate the treatment results and achieve positive clinical and endoscopic changes, it is advisable to repeat

AP sessions during the next 2-3 days, and then with an interval of two to three days.

AP as a means of eliminating pain in patients with pathology of the gastroduodenal zone has advantages over acupuncture due to the achievement of a long-lasting and stable pain-relieving effect, its use is non-threatening with regard to the transmission of infectious diseases that have a blood-contact transmission mechanism (HBV, HCV, AIDS), and can be used both for treatment and rehabilitation of the patient.

Our results of rapid pain relief are consistent with the literature, as pain is known to be the most important reason for treatment, and AP is one of the most common ways to relieve pain [4,13]. According to world data, the fastest and most pronounced effect of finger zhen is observed in painful conditions [4-11, 13, 24, 25]. Frank Warren noted that pressing (pressing) in the areas of acupuncture points with a finger can reduce or completely stop abdominal pain of various origins [8]. As noted by Mehta P et al. each meridian is associated with different organs and tissues of the human body, and the activation of a certain point on the meridian with pressure helps to reduce pain in a local place, and also reduces pain from other parts of the body [4]. Each meridian is connected to various organs and tissues of the human body. Activation of specific points on the meridian by pressure facilitates pain reduction at the local site and also reduces the pain from other parts of the body. That is why AP can be a useful alternative strategy to combat pain in patients with gastroduodenal pathology, which corresponds to the literature on the possibility of using non-pharmacological approaches (among which AP is one of the 4 possible) for the treatment of pain, which can complement or even replace pharmacological therapy of some types of pain [3, 10, 11].

Usually AP not only relieves pain, but also shortens the duration of the illness, eliminates functional disorders of the digestive organs, in particular, disorders of gastroduodenal motility. This is confirmed by the effectiveness of AP in biliary reflux gastropathy or biliary gastritis, which are based on functional motility disorders of the upper parts of the digestive tract.

At the end of the two-week course of treatment, clinical manifestations of abdominal and dyspeptic syndrome completely disappeared in 95% of patients (38/40), and symptoms of asthenovegetative syndrome – respectively, in 92.5% of patients (37/40). Only two patients had intermittent pain or slight discomfort in the epigastrium or heaviness in the stomach. At the end of treatment, 92.5% of patients rated the treatment effect as very good (complete absence of symptoms), and 7.5% – as good (significant reduction of symptoms).

The effectiveness of treatment is confirmed not only by subjective, but also by endoscopic studies (disappearance of signs of biliary reflux and erosive-ulcer gastropathy in FEGDS), which contributes to stable and long-term remission.

It is known that to determine the effect of treatment on the change in the frequency of manifestation of the syndrome, the nonparametric McNemar test is used for related samples (studies “before and after” treatment) [19,20,22]. At the end of treatment with the use of AP in patients with gastroduodenal

pathology, statistically significant changes in the frequency of manifestations of all three clinical syndromes were found (respectively, two-sided values of $p < 0.0001$ according to McNemar's test). This is evidence that there is a significant difference between these two proportions [20, 22]. The conducted statistical analysis shows the effectiveness of AP, which allows quickly and effectively eliminating the main clinical manifestations in patients with pathology of the gastroduodenal zone. That is why the null statistical hypothesis about the absence of a clinical effect of AP is rejected and an alternative hypothesis is accepted [19, 20]: the proposed method of rehabilitation and treatment is effective.

Tolerability of AP in all patients was good. Side effects of AP were not registered in patients. With a probability of 95%, we can state that the risk of developing a side effect from the use of AP does not exceed 9%. The obtained data are consistent with the literature on the safety of AP [4-7, 13, 24] and only some authors indicate minimal side effects associated with the using of too much pressure [25].

CONCLUSIONS

1. AP is a non-invasive and non-pharmacological intervention for painless treatment and rehabilitation of many diseases. It can be a useful alternative strategy to combat pain in patients with chronic gastritis associated with *H. pylori*, biliary gastritis and in the presence of erosive-ulcerative lesions of the gastroduodenal zone.
2. AP increases the effectiveness of rehabilitation and treatment of patients with gastroduodenal pathology: it contributes to the rapid disappearance of the main clinical manifestations and endoscopic signs of the disease, stable and long-term remission, which allows to significantly improve the general condition of patients and improve their quality of life.
3. AP not only relieves pain, but also shortens the duration of the illness, eliminates functional motility disorders of the upper parts of the digestive tract in biliary reflux gastropathy and biliary gastritis.
4. The proposed method of rehabilitation and treatment is not only effective, but also safe: with a probability of 95%, it can be stated that the risk of side effects of AP does not exceed 9%.

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Conflict of interest:

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