

Original paper

Analgesic effect of medicinal leeches in chronic diseases

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ABSTRACT. 48 young, middle-aged and elderly male and female subjects with various chronic diseases of various body systems were studied under the influence of the complex of biologically active substances of the medicinal leech species *Hirudo verbana*. It was found that medicinal leeches are able to show strong analgesic effects in various chronic pathologies, regardless of gender and age. The beginning of the pain-relieving effect occurs already after the first attachment, and the maximum effect is manifested after the third and fourth production. In addition to the pain-relieving effect, most of the subjects, regardless of the article and age, felt a strong influx of energy, and after completing the course of productions, the physiological parameters of the blood began to recover and the functionality of the organs began to recover.

Keywords: medicinal leeches, chronic diseases, painkillers, biologically active substances

Introduction

Medicinal leeches are mostly ectoparasitic animals that are used in artificial conditions in biolaboratories for preventive and therapeutic purposes [1–12]. Since there are more than 150 biologically active substances (BAS) in their body, which show a significant number of positive effects: immunomodulatory, antimicrobial and anti-inflammatory, as well as positive effect on formative regeneration processes, stimulate the growth of nerve fibers of the spinal ganglion of a chicken embryo, etc. [1–21]. Medicinal leeches are effectively used for the prevention and treatment of many diseases: chronic dermatoses, leiomyoma of the skin, psoriasis, heart failure, hypertension, infectious myocarditis, glaucoma, acute and chronic diseases of the middle and inner ear, arthritis, osteochondrosis, cerebrovascular diseases, endometriosis, uterine myoma, chronic inflammation of the appendages, nephritis, diabetic foot, diabetes, thrombophlebitis and other vascular disorders, chronic and dystrophic diseases of the salivary glands, stomatitis, pulpitis, etc. Also they are used, in psychotherapy, to eliminate manifestations of allergies, to eliminate venous stasis during transplantations, during treatment of diseases of the nervous system, in reconstructive surgery, cancer therapy, in treatment of infectious diseases, for

wound healing, male and female infertility [1–12,19,21]. And this is only part of the indications for which ectoparasitic animals are effectively used. Therefore, according to such therapeutic effects, it became relevant to analyze the manifestation of the analgesic effect of the medicinal leech ectoparasite *Hirudo verbana* in various chronic diseases of the male and female sexes.

Materials and Methods

48 people were studied (24 men and 24 women): 16 people young (28–35 years old), 16 people middle-aged (50–55 years old) and 16 people old (60–75 years old) with various chronic diseases of various systems of organs: axial hernia of the esophageal opening of the diaphragm 2–3 degrees, arterial hypertension, chronic gastritis, chronic gastroduodenitis, chronic hepatocholecystitis, chronic pancreatitis, chronic appendicitis, arthrosis, arthritis, polyarthritis, duodenal dyskinesia, varicose veins of the lower extremities, chronic hemorrhoids, bronchial asthma, chronic bronchitis, stable and unstable angina pectoris, chronic prostatitis. The diseases were diagnosed in the hospital. All chronic diseases belonged to all age groups and sexes since most diseases did not appear alone. The results were evaluated before and after

Table 1. Manifestation of an analgesic effect after the attachment of leeches

Sex/age	1st ap.	2nd ap.	3rd ap.	4th ap.	5th ap.	6th ap.	7th ap.	8th ap.
Young aged								
Male	+	++	+++	+++	+++	+++	+++	+++
Female	+	++	+++	+++	+++	+++	+++	+++
Middle aged								
Male	+	++	++	+++	+++	+++	+++	+++
Female	+	++	++	+++	+++	+++	+++	+++
Elderly aged								
Male	+	++	++	+++	+++	++	+++	+++
Female	+	++	++	+++	+++	+++	+++	+++

Notes: ap. – application; + – the onset of the analgesic effect; ++ – increase in analgesic effect, +++ – maximum analgesic effect



Figure 1. Local injection sites for the pancreas, appendicitis, liver, colon, prostate gland, urinary bladder (A), heart and esophagus (B), around the knee joint (C), thigh (D)

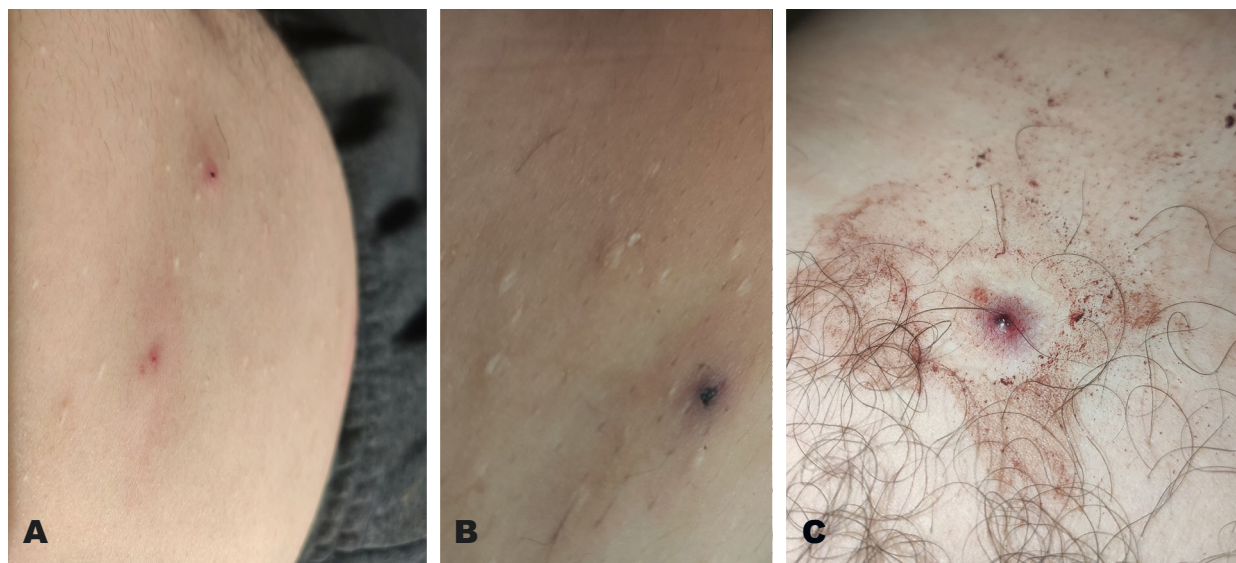


Figure 2. Small redness (A, B) and hematomas after application (C)

the first completed hirudological course by doctors, the anamnesis was taken from the objects with their consent. On average, 4–5 medicinal leeches of the species *Hirudo verbana* were used for one application. The speed of manifestation of the pain-relieving effect at each stage in different articles and age groups was evaluated. The beginning of manifestation, increase and maximum effect were labeled with pluses.

Results and Discussion

As a result of the study, it was found that the beginning of the analgesic effect (+) is mostly manifested in all age groups, regardless of the sex and disease are represented in the Table 1.

In young people, the analgesic effect is manifested on average on the first to second day after the first application, on average on the first to third day in middle-aged people, on the second to fourth day in elderly people. Further, after the second application, the analgesic effect begins to increase (++) in all age groups. On average, young people get the maximum pain-relieving effect (+++) after the third application, and middle-aged and elderly people after the fourth application. Further, the pain-relieving effect is maximally effective after each application. It should be noted that the analgesic effect was most effective when applied locally at the site of pathology (Fig. 1), which is noted by other authors and our previous studies regarding other therapeutic effects [1–7,9].

In addition to the pain-relieving effect, most of the subjects, regardless of the sex, felt a strong

influx of energy. After completing one course of applications, most of the patients began to recover blood parameters, blood coagulation decreased, blood pressure equalized to the norm, external signs of varicose veins disappeared, the functionality of organs began to recover. We observed these restoring effects in our previous studies and studies of other authors [1–13,15,17–20]. After the first course, most of the researched wanted to repeat the course. This is not for nothing, because it is known what a wide therapeutic effect this ectoparasite has [1–21]. It should be noted that most of the experimental subjects did not have a significant manifestation of an allergic reaction after the productions, some had small circular spots up to 15 cm in diameter (Fig. 2), which disappeared after a while, and itching of varying intensity appeared on the second day. Bleeding stops completely after 4–6 hours on average.

Visually, some may have minor hematomas near the wounds (Fig. 2), which then disappear. Inflammation and infection of wounds were not observed in the objects. Summarizing the results, we can conclude that medicinal leeches are able to show strong analgesic effects in various chronic pathologies. The obtained results can be useful primarily in the symptomatic treatment of various diseases.

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