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Original Research

Use of BEE BREAD and Drone Larvae Homogenate in the Treatment of Chronic Bacterial Prostatitis: Results of an Early-Phase Clinical Study

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ABSTRACT

The development of apitherapy began many centuries ago. However, currently, it is still not a widespread method for the treatment of various diseases. To strengthen the evidence base for apitherapy, a series of clinical studies of bee products was organized.

In 2021, at the Kharkiv National Medical University (Ukraine), at the clinical sites of the Department of Urology, Nephrology and Andrology, an early-phase clinical study was conducted on the use of bee products in the complex treatment of chronic bacterial prostatitis.

The study included 60 patients with chronic prostatitis who had previously used standard treatment methods. In the complex treatment of these patients, the following combination of bee products was used: 1) lyophilized drone larvae homogenate, 2) suppositories with drone homogenate, 3) bee bread (perga). An important objective of the study was to investigate the tolerability and safety of these bee products, as well as to assess the potential for further in-depth research on this topic.

As a result of the complex treatment, high and moderate effectiveness was achieved for 93.3% of patients, and low - only for 6.7%. A significant improvement in clinical and laboratory parameters was achieved: 1) pain on palpation disappeared, 2) the size of the prostate gland decreased and the heterogeneity of its structure disappeared, 3) the number of leukocytes decreased, 4) the number of erythrocytes decreased, 5) testosterone levels increased, etc.

It is important to note that this study was conducted as an early-phase study using a «patient-as-own-control» methodology, which was reflected in both the study design and the interpretation of its results.

An early-phase clinical study of the use of homogenate of drone larvae and bee bread for patients with chronic bacterial prostatitis showed their high effectiveness and tolerability. Therefore, these natural and safe products are very promising for further research and practical application for the prevention and treatment of various diseases.

Keywords: apitherapy, prostatitis, drone homogenate, apilarnil, bee bread.

INTRODUCTION

Prostatitis is currently one of the most common urological diseases in men. This condition significantly impairs men's quality of life, so the task of improving the effectiveness of its prevention and treatment is highly relevant. At the same time, the use of apitherapy in solving men's health problems has a long and successful history.

Unfortunately, this successful experience has not been sufficiently researched and described, which significantly complicates its study, dissemination and practical implementation. In order to strengthen the evidence base for the effectiveness of apitherapy and to encourage the use of natural and safe methods of improving men's health, an early-phase clinical study was initiated and conducted.

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This study was conducted in 2021 at the Department of Urology, Nephrology, and Andrology at Kharkiv National Medical University (Kharkiv National Medical University, 2022). The study focused on the efficacy and safety of bee products in combination therapy for chronic bacterial prostatitis.

MATERIALS AND METHODS

To conduct this study, two bee products were used: bee bread (perga) and drone larvae homogenate.

Bee bread (perga) is a product made from bee pollen processed by bees and stored in honeycomb cells (State Standard of Ukraine, 2010). Bee bread is a mixture of pollen granules, honey, and lactic acid bacteria (Ministry of Agriculture, Agri-food and Food Sovereignty, n.d.). Active production and distribution of bee bread on the European continent began about 20 years ago. Therefore, in many countries, this bee product may currently be completely unavailable.

However, bee bread is already authorized as an ingredient for dietary supplements in the European Union. And in Ukraine, for example, where the production and use of bee products are widespread and objectively ahead of those of many other countries, a national standard for these bee products has been in effect since 2009 (State Standard of Ukraine, 2010).

There are numerous scientific studies confirming the high antimicrobial potential of bee bread, for example (Pełka et al., 2021). This is why this bee product was included in this clinical study.

The second and most important bee product used in the study is drone larvae homogenate. This product is sometimes called drone milk or Apilarnil. The name Apilarnil was introduced at the end of the last century by Romanian researcher Nicolae Iliesiu. To avoid conflicts of interest, we do not use this name and instead characterize the product as drone larvae homogenate, basing our definition on the national standard adopted in Ukraine in 2013. Drone larvae homogenate is obtained by grinding 7-day-old drone larvae (State Standard of Ukraine, 2013).

Scientists from around the world have actively studied this bee product for several decades. Drone larvae homogenate contains proteins, amino acids, vitamins, minerals, fatty acids, and hormone-like substances and has been traditionally used in apitherapy because of its biological activity (Bogdanov, 2017; Isidorov et al., 2019). The unique composition of drone larvae homogenate determined the choice of this bee product for this clinical study.

Generally, the study included 60 patients aged 28 to 55 years with chronic prostatitis, defined as symptoms persisting for more than three months (Ministry of Health of Ukraine, 2017). These patients had previously used standard treatments, but their effectiveness was quite low. Therefore, the decision was made to use a combination therapy using bee products.

A «patient-as-own-control» methodology was used in the design of this early-phase study and in the interpretation of its results.

In the complex treatment of these patients, the following combination of bee products was used: 1) lyophilized drone larvae homogenate, 1 capsule 3 times a day (per os), 2) suppositories with drone homogenate and wheat germ oil 1 time a day (per rectum), 3) bee bread (perga), 5-7 granules per day 30 minutes before meal (per os). Patients took the complex of bee products for 30 days.

All bee products for the clinical study were produced and provided by MEDOK Company LLC (Ukraine). The product “Drones larvae homogenate lyophilized” was patented in Ukraine in 2015. One capsule of this product includes 250 mg lyophilized drones larvae homogenate. Suppositories containing drone homogenate and wheat germ oil were patented in Ukraine in 2018. Supporitories with drone larvael homogenate were used as an auxiliary/supportive remedy, patients received the main part of the drone homogenate in capsules.

All patients also received the standard basic therapy, including antibiotics, immunomodulators, enzymes, and anti-inflammatory products, as well as physiotherapy procedures.

A complete clinical and laboratory examination was performed pre- and post-treatment, including the following: recording of medical history, evaluation of symptoms and previous treatment; digital rectal examination; prostate and bladder ultrasound examination with determination of residual urine volume (Toshiba Aplio 500 apparatus); laboratory tests: complete blood count, urinalysis, blood biochemistry, sex hormone test, microscopy of prostatic secretion; bacterioscopic examination with Gram, Romanowsky–Giemsa, and methylene blue staining (Olimpus BH2 microscope); bacteriological examination of the prostatic secretion with pathogen identification by the morphological, tinctorial, and culture-based methods (by J. Holt at al., 1997).

The colony-forming unit (CFU) counts were determined by the serial dilution method followed by the inoculation of media. The sensitivity of the isolated cultures to the antimicrobial medicinal products was determined by the Bauer–Kirby disk diffusion method using the commercial disks according to Order of the Ministry of Health of Ukraine No. 167.

Hormone tests. The testosterone, luteinizing hormone (LH), prolactin, and estradiol serum levels were determined by enzyme-linked immunosorbent assay (ELISA) using CIS Bio International (France) test kits.

Evaluation of clinical symptoms and quality of life. The International Prostate Symptom Score (IPSS) with quality of life index (QoL) was used to evaluate the severity of the lower urinary tract symptoms. The questionnaire was completed pre- and post-treatment.

Evaluation of efficacy and safety. The therapy efficacy was evaluated using the Composite Clinical Score Scale (Table 1) involving the changes of symptoms, laboratory tests, and investigation results over time.

The side effects were classified using the five-score scale: 5 scores — no side effects; 4 scores — mild, not requiring product discontinuation; 3 scores — moderate, affecting the patient's condition but not requiring discontinuation; 2 scores — marked, requiring therapy discontinuation; 1 score — severe, requiring discontinuation of product and medical intervention.

High efficacy	CP index decreased by ≥ 14 scores by NIH-CPSI questionnaire, 1999. Statistically significant reduction of WBC count in prostatic secretion. Decrease in tenderness and density of the prostate gland according to digital rectal examination findings.
Moderate efficacy	Two of the above conditions are met
Low efficacy	One of the above conditions is met
Lack of efficacy	None of the above conditions is met

Table 1: Evaluation of efficacy

RESULTS

This early-phase clinical study concluded with a set of important results. The main ones will be described below.

Changes in Symptom Severity and Quality of Life

As a result of the treatment received, the patient-reported IPSS total score was decreased by 93.9%, quality of life was improved by 29.3% and performance status from severe to mild by total score (S+L) (Table 2).

Measure	Pre-treatment	Post-treatment
IPSS	24.5 ± 0.3	2.3 ± 0.1
L	4.1 ± 0.1	1.2 ± 0.1
S+L	28.6 ± 0.3	3.5 ± 0.1

Table 2: Results of symptom evaluation during the treatment

IPSS – International Prostate Symptom Score (0–35 points), a validated questionnaire used to assess the severity of lower urinary tract symptoms.

L – Quality of Life Index (0–6 points), assessed by the patient.

S + L – Composite score calculated as the sum of the IPSS symptom score and the Quality of Life Index. Overall condition was classified as mild (≤7 points), moderate (8–19 points), severe (20–35 points), or very severe (>35 points).

Digital Rectal Examination Findings

During the pre-treatment digital rectal examination, the prostate tenderness was observed in all patients and swelling - in 36 (60%); post-treatment, the tenderness was observed only in 8 (13.3%) patients. In addition, the well-defined prostate contours were detected pre-treatment only in 44 (73.3%) patients, and post-treatment in all patients (Table 3).

Findings of prostate digital rectal examination	Pre-treatment, n (%)	Post-treatment, n (%)
Tenderness on palpation	60 (100)	8 (13.3)
Well-defined contours	44 (73.3)	60 (100)
Swelling	36 (60)	0

Table 3: Findings of clinical examination of patients with chronic prostatitis

Laboratory and Hormonal Findings

The laboratory tests of patients did not show any significant differences in the complete blood count, blood biochemistry, and urinalysis results (Table 4). At the same time, the pre- and post-treatment prostate secretion test demonstrated significant differences ($p < 0.001$). Thus, the pre-treatment WBC count per field of view (for treatment in general) was 21.8 ± 23.2, and post-treatment it was 7.3 ± 3.2, i.e. it was decreased by 66.5%; the pre-treatment RBC count was 0.4 ± 0.6, and post-treatment it was 0.1 ± 0.2, i.e. it was decreased by 75%; the pre-treatment lecithin count was 112.6 ± 71.6, and post-treatment it was 164.3 ± 79.6, i.e. it was increased by 68.5%.

The significant changes ($p < 0.001$) were also demonstrated in the hormone blood tests. The testosterone level was increased from 6.4 ± 2.4 to 8.2 ± 3.1 ng/ml, i.e. by 22%, and the estradiol level, on the contrary, was decreased by 6.7% — from 28.3 ± 9.3 to 26.4 ± 7.6 pg/ml.

Laboratory test results	Pre-treatment	Post-treatment
Complete blood count:		
Hemoglobin, g/l	150.6 ± 16.9	151.4 ± 15.7
WBC, 109/l	6.3 ± 1.7	6.1 ± 1.2
Lymphocytes, %	29.9 ± 8.7	29.4 ± 8.9
Monocytes, %	6.9 ± 2.2	6.7 ± 2.3
ESR, mm/g	6.3 ± 5.9	5.7 ± 4.8
Blood biochemistry		
Glucose, mmol/l	4.4 ± 0.6	4.3 ± 0.7
Total protein, g/l	73.9 ± 5.1	74.2 ± 5.3
Urea, mmol/l	5.6 ± 1.4	5.6 ± 1.3
Total bilirubin, μmol/l	13.2 ± 3.4	13.3 ± 3.5
Direct bilirubin, μmol/l	3.6 ± 0.9	3.7 ± 0.8
ASAT, mmol/g·l	29.0 ± 8.4	28.7 ± 7.9
ALAT, mmol/g·l	29.1 ± 13.8	28.9 ± 12.4
Urinalysis		
Specific gravity	1016.3 ± 5.6	1016.5 ± 6.4
pH	5.2 ± 0.3	5.3 ± 0.4
Protein, g/l	0.03 ± 0.09	0.03 ± 0.08
WBC, units per field of view	4.9 ± 7.3	4.3 ± 2.8
RBC, units per field of view	1.0 ± 1.3	1.0 ± 0.6
Epithelium, units per field of view	1.5 ± 0.1	1.5 ± 0.1
Prostatic secretion:		
WBC, units per field of view	21.8 ± 23.2	7.3 ± 3.2
RBC, units per field of view	0.4 ± 0.6	0.1 ± 0.2
Lecithin granules, units per field of view	112.6 ± 71.6	164.3 ± 79.6
Blood hormone test		
Testosterone (ng/ml)	6.4 ± 2.4	8.2 ± 3.1
LH (IU/l)	5.0 ± 2.0	4.9 ± 2.1
Prolactin (IU/l)	7.2 ± 1.5	7.1 ± 1.4
Estradiol (pg/ml)	28.3 ± 9.3	26.4 ± 7.6

Table 4: Laboratory test findings

Ultrasound Findings

The pre-treatment ultrasound examination showed the inhomogeneous prostate structure in 52 (86.7%) patients, and its inhomogeneity was detected post-treatment only in 14 (23.3%) patients. During the treatment, a significant decrease ($p < 0.05$) in the prostate dimensions was also demonstrated. The pre-treatment cranio-caudal prostate dimension was 37.8 ± 3.2 mm, and post-treatment — 32.6 ± 2.9 mm; the pre-treatment lateral prostate dimension was 30.6 ± 3.4 mm, and post-treatment —28.4 ± 3.2 mm. The pre-treatment residual urine with the maximum volume up to 30 cm3 was detected in 6 patients. None of the patients demonstrated the post-treatment residual urine (Table 5).

Prostate ultrasound examination	Pre-treatment	Post-treatment
Cranio-caudal dimension, mm	37.8 ± 3.2	32.6 ± 2.9
Lateral dimension, mm	30.6 ± 3.4	28.4 ± 3.2
Structure homogeneity	inhomogeneous in 52 (86.7%)	inhomogeneous in 14 (23.3%)
Residual urine, cm3	2.5 ± 6.8	0

Table 5: Investigation findings.

The pre-treatment ultrasound examination detected the local changes of prostate structure in 8 (13.3%) patients, and post-treatment — in 6 (10.0%) patients. At the same time, the pre-treatment diffuse changes were observed in 52 (86.7%) patients, and post-treatment — only in 14 (23.3%) patients (Table 6).

Symptoms	Values	
	Pre-treatment, n (%)	Post-treatment, n (%)
Tenderness on palpation	60 (100)	8 (13.3)
Focal changes in ultrasound examination	8 (13.3)	6 (10.0)
Diffuse changes in ultrasound examination	52 (86.7)	14 (23.3)

Table 6: Objective prostate changes over time

Overall Clinical Efficacy

The high and moderate efficacy was achieved in 93.3% of patients, and low efficacy only in 6.7% of patients with chronic bacterial prostatitis who received 30-day combination therapy (Table 7).

Level	Number of patients	%
High	36	60
Moderate	20	33.3
Low	4	6.7
Lack of effect	0	0

Table 7: Evaluation of efficacy of combination therapy used: suppositories with drone homogenate and wheat germ oil, lyophilized drone homogenate in capsules, and bee bread in granules.

Safety and Tolerability

Only 2 (3.3%) patients reported mild skin itching during treatment suppositories with drone homogenate and wheat germ oil, lyophilized drone homogenate capsules, and bee bread, no side effects were observed in other patients (Table 8).

Scores	Patients	%
5	58	96.7
4	2	3.3
3	0	0
2	0	0
1	0	0

Table 8: Evaluation of side effects when using the combination therapy.

DISCUSSION

The results of this early-phase clinical study suggest that the combination of bee bread (perga) and drone larvae homogenate may provide beneficial adjunctive effects in patients with chronic bacterial prostatitis. Improvements were observed in symptom scores, quality of life, laboratory findings, hormonal parameters, digital rectal examination findings, and ultrasound characteristics of the prostate. The high or moderate efficacy observed in 93.3% of patients supports their potential use in urological practice.

The observed effects may be related to the complex biochemical composition of the bee products used in the study. Bee bread contains proteins, amino acids, vitamins, minerals, and biologically active compounds and has demonstrated antimicrobial activity in previous studies (Pełka et al., 2021). Drone larvae homogenate is also characterized by a rich composition of biologically active substances, including proteins, amino acids, vitamins, minerals, and hormone-like compounds, which may contribute to its physiological effects.

Recent studies published after completion of the present clinical study have identified drone larvae homogenate as a rich natural source of spermidine (Tausendfreund & Gloger, 2025). Spermidine has attracted increasing scientific interest because of its potential effects on cellular metabolism, inflammatory processes, tissue regeneration, and healthy aging. Although these findings were not available when the study was designed and conducted in 2021, they may provide a possible biological explanation for some of the beneficial effects observed in the present study.

The present study was designed as an early-phase exploratory clinical investigation. A patient-as-own-control methodology was used. Although this approach was formally discussed in the apitherapy literature only after completion of the present investigation (Körmendy-Rácz, 2025), the underlying methodological concept has long been

recognized in clinical research through within-subject and self-controlled study designs. All patients continued to receive standard medical treatment, while bee products were introduced as adjunctive interventions. Therefore, each patient served as his own reference point for evaluating changes over time. The primary objective of the study was to evaluate the tolerability and potential clinical value of bee products in patients with chronic bacterial prostatitis.

Within this framework, clinically meaningful improvements were observed in symptoms, laboratory findings, hormonal parameters, digital rectal examination findings, and ultrasound characteristics of the prostate. The high proportion of patients achieving high or moderate efficacy, together with the excellent tolerability profile, supports the potential value of bee bread and drone larvae homogenate as adjunctive components of complex therapy in patients with chronic bacterial prostatitis.

The observed effects are considered to be associated with the biological properties of bee bread and drone larvae homogenate rather than with a specific commercial product. Comparable effects may potentially be achieved using products of equivalent quality and composition.

In the absence of officially approved and generally accepted methods for conducting clinical trials of bee products in Ukraine, the design of such studies is largely determined by their authors and may be subject to debate among specialists. To address this issue, leading apitherapy scientists are working to develop methodological standards for such research (Kurek-Górecka et al., 2024). Strengthening the methodology of bee product research is essential for improving the scientific quality, comparability, and practical value of future studies

CONCLUSION

To our knowledge, this is the first study to examine the use of drone larvae homogenate and bee bread in the treatment of chronic bacterial prostatitis. The study was conducted as an early-phase investigation using a patient-as-own-control methodology; therefore, these methodological characteristics should be taken into account when interpreting the findings.

High or moderate efficacy was achieved in 93.3% of patients, while tolerability was excellent.

The findings of this early-phase clinical study support the potential value of bee products as adjunctive components of complex therapy in patients with chronic bacterial prostatitis. The observed effects may be related to the health-promoting, anti-inflammatory, antibacterial, immunomodulatory, regenerative, and endocrine-regulating properties of bee products and to their complex biochemical composition.

The results support further investigation of bee products, particularly drone larvae homogenate, in larger and more rigorously controlled clinical studies. Of particular interest are the biological effects of drone larvae homogenate as a relatively new and still insufficiently studied bee product, as well as the potential effects of combining different bee products in therapeutic applications.

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CONFLICT OF INTEREST

MEDOK Company LLC is a producer of lyophilized drone larvae homogenate, suppositories with drone homogenate and wheat germ oil, bee bread (perga).

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INFORMED CONSENT

Written informed consent for the processing of clinical data and their further use was obtained from patients participating in the study.

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