ELECTRODE PHARMAPHORESIS

The system for controlled transfer of drugs, gels, stem and plant cells, phytotherapeutic preparations, oxygen, ozone, and other drugs for local therapeutic effect.

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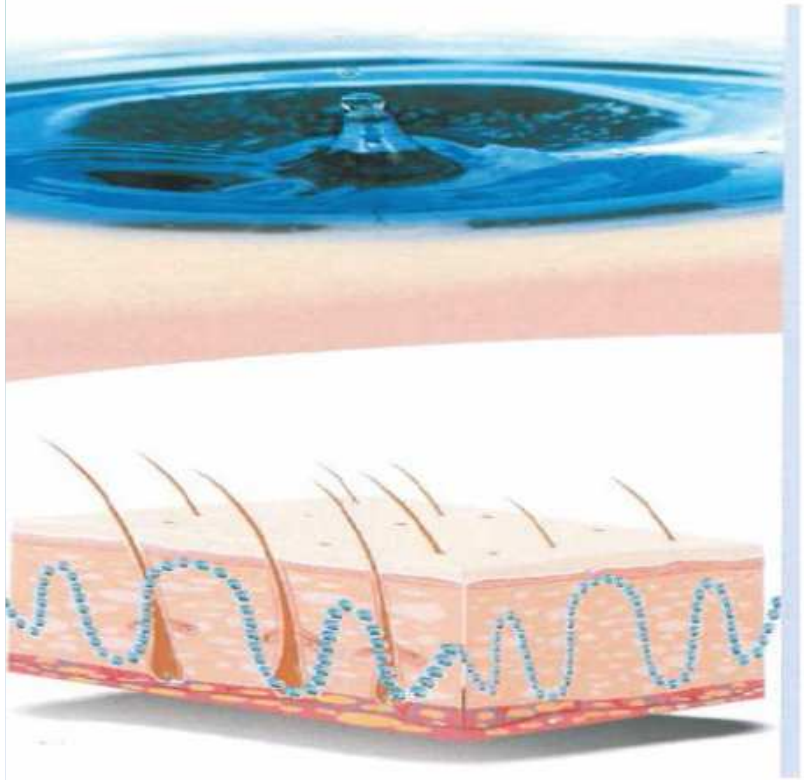
Mosca - 2013

Transdermal therapy or
"Virtual syringe"
in the uro-andrological practice



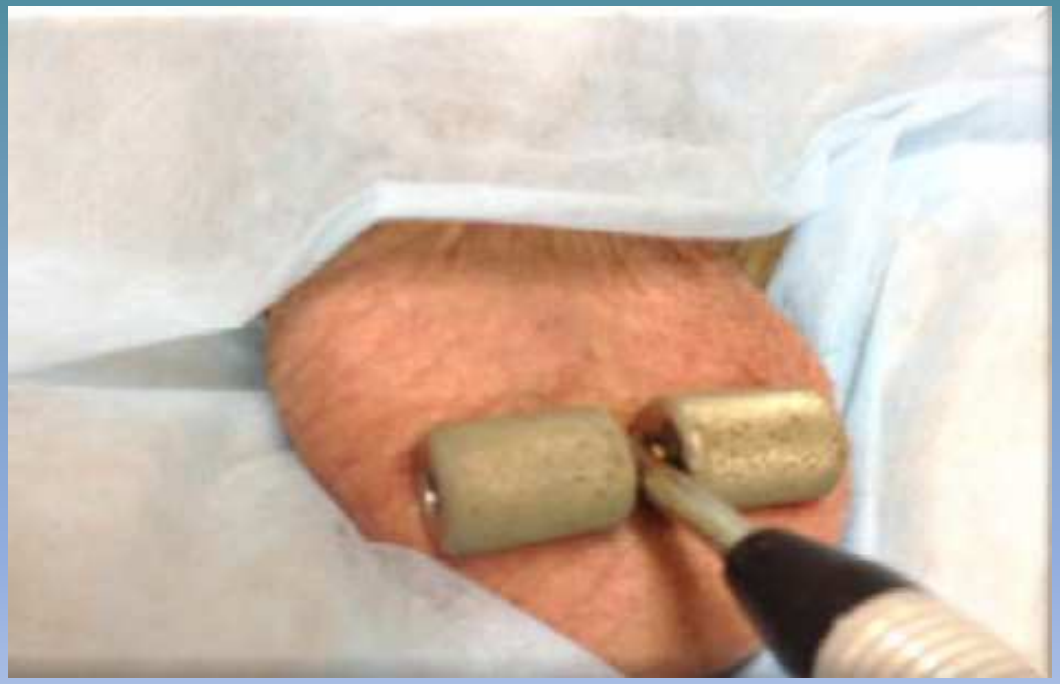
Unique innovation system

Farma T.E.B. Physio (Farmaforesi Trans Epidermal Barrier) for administration through the skin and underlying tissues of the active drugs to a depth of **10-12 cm** to act on different areas of the pathological process.

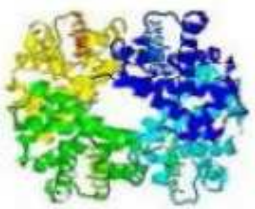
Method of the drug administration by bypassing the bloodstream does not have systemic effects, and physical factors do not damage the cell membrane and the drugs themselves.

Bioelectrode reptation

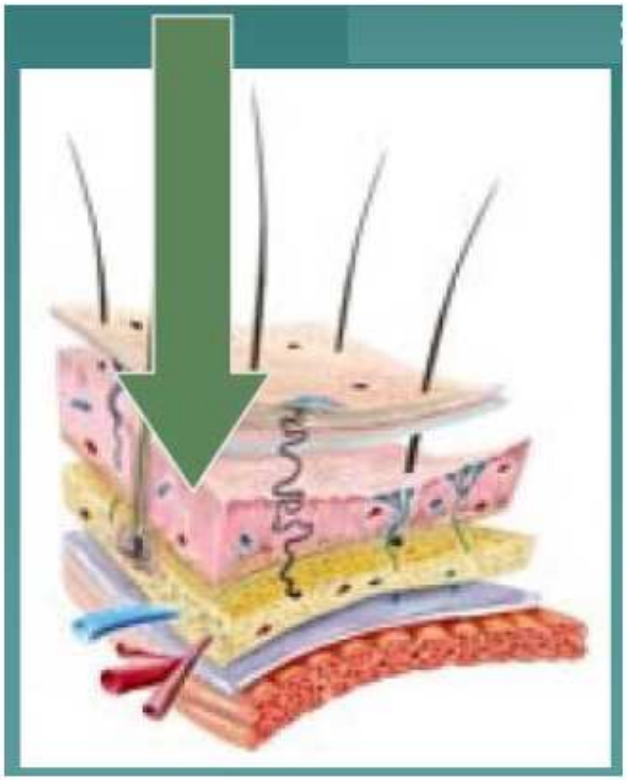
"Bioelectrode reptation" is a method of administering one or more drugs simultaneously to the desired depth. Drugs used in the official pharmacopoeia are introduced locally to the "target organ" without affecting other organs and tissues.



Bioelectrode reptation



Active substance:
- high molecular mass
- complex form



❿ "Bioelectrode reptation" – a method used to act on the neuroendocrine apparatus of the skin and the underlying tissues, allowing to deliver pharmacological agents with high molecular mass directly to specific receptors of cells.

Bioelectrode reptation

Electrical effect on the active substance
The substance is delivered directly to the specified subdermal level.

The molecules are delivered to the destination without any changes to the structure, shape, weight, etc., as well as no change at the electronic level (charge distribution).

The active substance is transferred directly to the cell receptor of the damaged tissue by electric current.

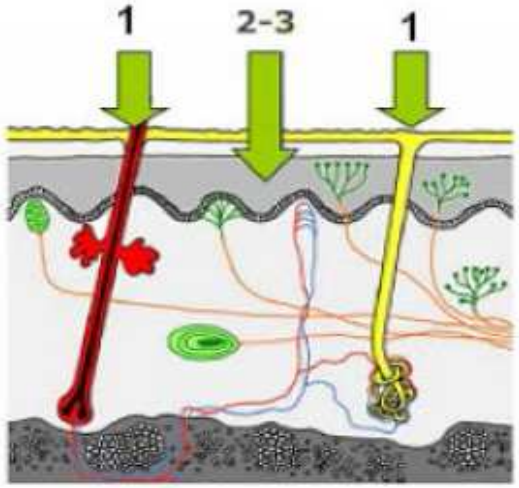
The bioelectrode reptation allows for delivery of the active material in its original form without losing its informational, nutritional and supportive characteristics.

Bioelectrode reptation

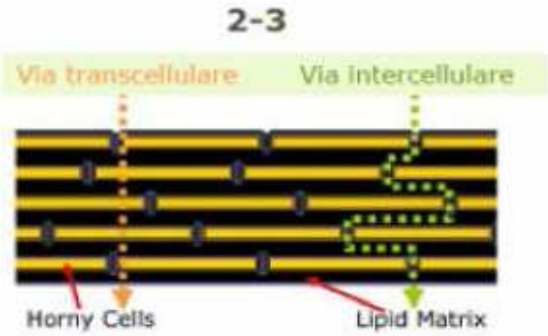
Overcoming the “epidermal barrier”

All subsequent layers are overcome without damage in three main ways.

1. Accessory
2. Intracellular
3. Intercellular



1 Via annessiale
2-3 Via transepidermica



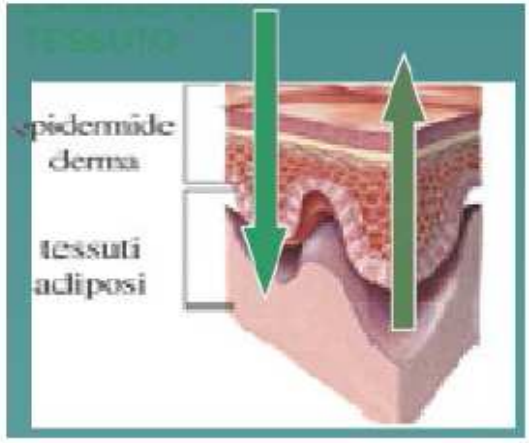
Bioelectrode reptation

2. Achieving the target point in the cell receptor Signals

By analysis and modelling of biological tissues, it is possible to determine different tissues in the target area (1 and 2). By applying electrical signals of varying frequency, amplitude, shape and impulse, customized type of action is selected within the acceptable range.

Autoadaptation stage

1. Impulse assessing the tissue structure.



2. Response signal. Customized action.

2. Achieving the target point in the cell receptor

To optimize the results, the device uses different methods of analysis:

- Measuring impedance at different frequencies (patented)
- Pure ohmic resistance
- Pulse response at low and high frequency.

The basic method is unique innovative characteristic of copyrighted device.

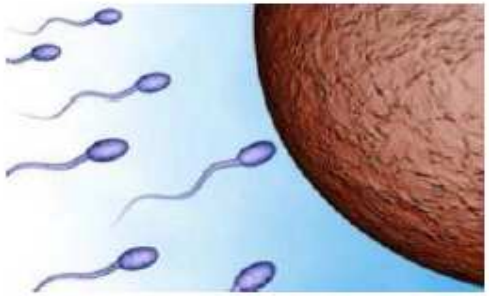
Farma T.E.B. Physio
(Farmaforesi Trans Epidermal Barrier)

Transfer of drugs transdermally, without damaging the skin and body's own tissues.

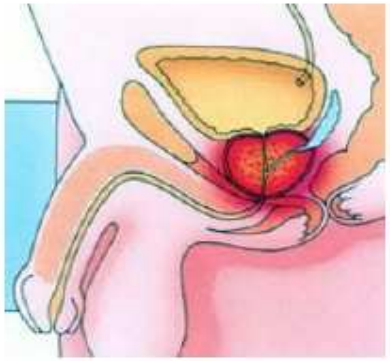
"Virtual syringe" system, in which the needle is replaced by special wave pulses, allowing to transport drugs to the desired depth and the thickness of the tissue.

Application of the electrode pharmaphoresis

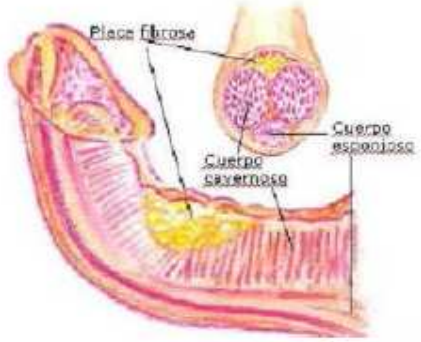
Male infertility



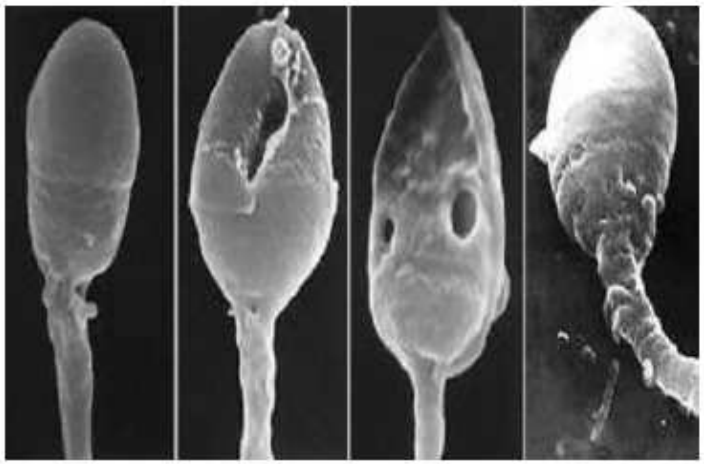
Chronic prostatitis



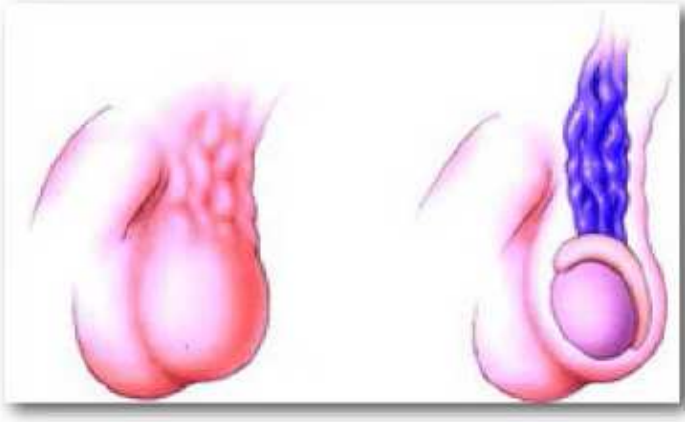
Peyronie's disease



Characteristics of patients with pathozoospermia undergoing transdermal therapy



(n=20)



(n=14) idiopathic pathozoospermia

(n=6) after surgical treatment of varicocele, including:

(n=4) Marmar's surgery

(n=2) laparoscopic clipping of the testicular vein

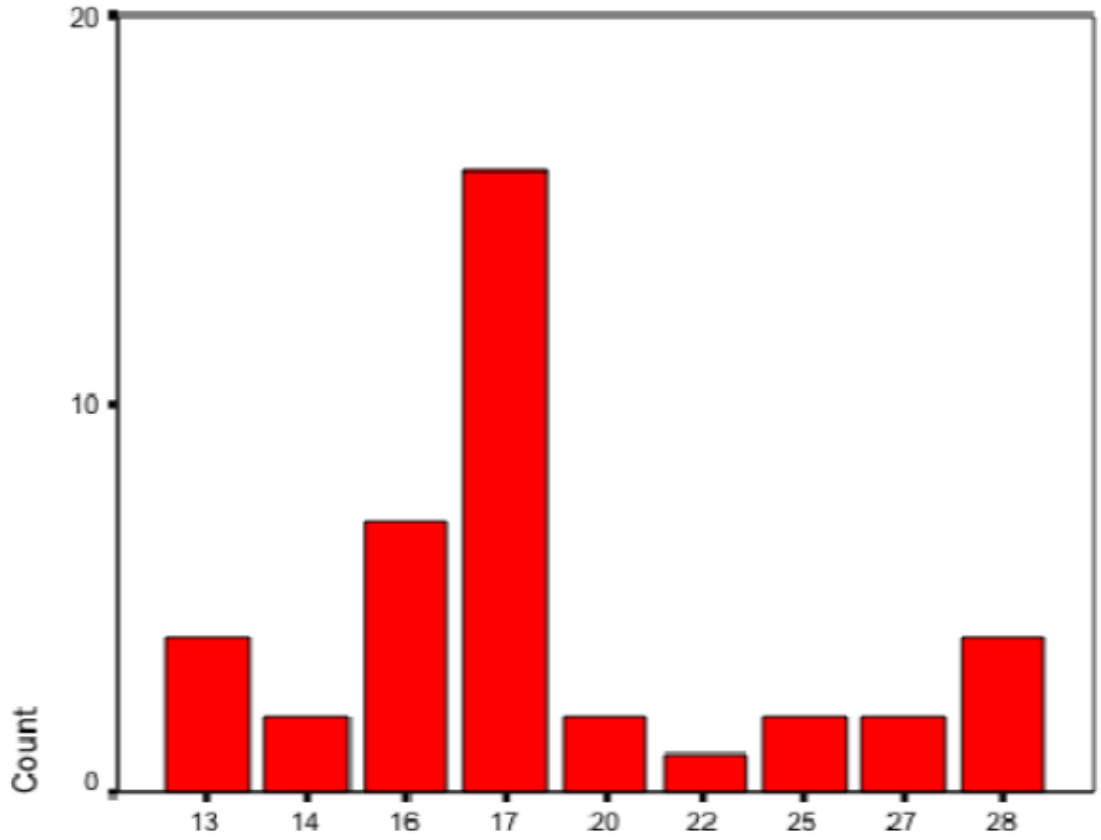
Results of the examination prior to treatment

	N	Minimum	Maximum	Mean		Skewness		Kurtosis	
Indicator	Statistic	Statistic	Statistic	Statistic	Std. error	Statistic	Std. error	Statistic	Std. error
Sperm motility (a+b) %	20	4	42	21.40	2.48	0.015	0.512	-0.696	0.992
Number of sperm (million/ml)	20	10	19	13.70	0.67	0.431	0.512	-1.128	0.992
Pathological forms (%)	20	50	98	88.75	2.25	-3.193	0.512	12.535	0.992
Total testosterone (nmol/l)	20	13	17	15.55	0.35	-0.780	0.512	-1.032	0.992
Ejaculation amount (ml)	20	0.5	2	1.25					

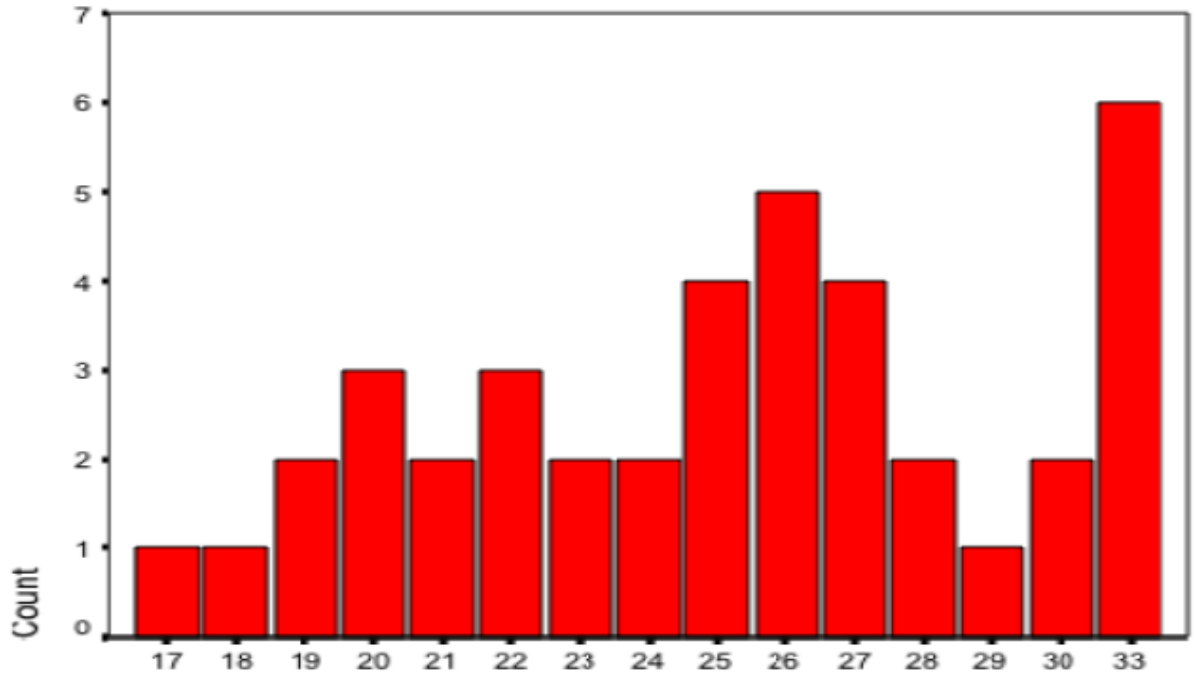
Results of examination after treatment

	N	Minimum	Maximum	Mean		Skewness		Kurtosis	
Indicator	Statistic	Statistic	Statistic	Statistic	Std. error	Statistic	Std. error	Statistic	Std. error
Sperm motility (a+b) %	20	32	52	40.45	1.58	-0.050	0.512	-1.734	0.992
Number of sperm (million/ml)	20	13	32	13.70	1.58	-0.050	0.512	-1.734	0.992
Pathological forms (%)	20	66	87	88.75	1.58	-0.050	0.512	-0.050	0.992
Total testosterone (nmol/l)	20	17	28	21.55	1.08	0.326	0.512	-1.817	0.992
Ejaculation amount (ml)	20	2	6	4					

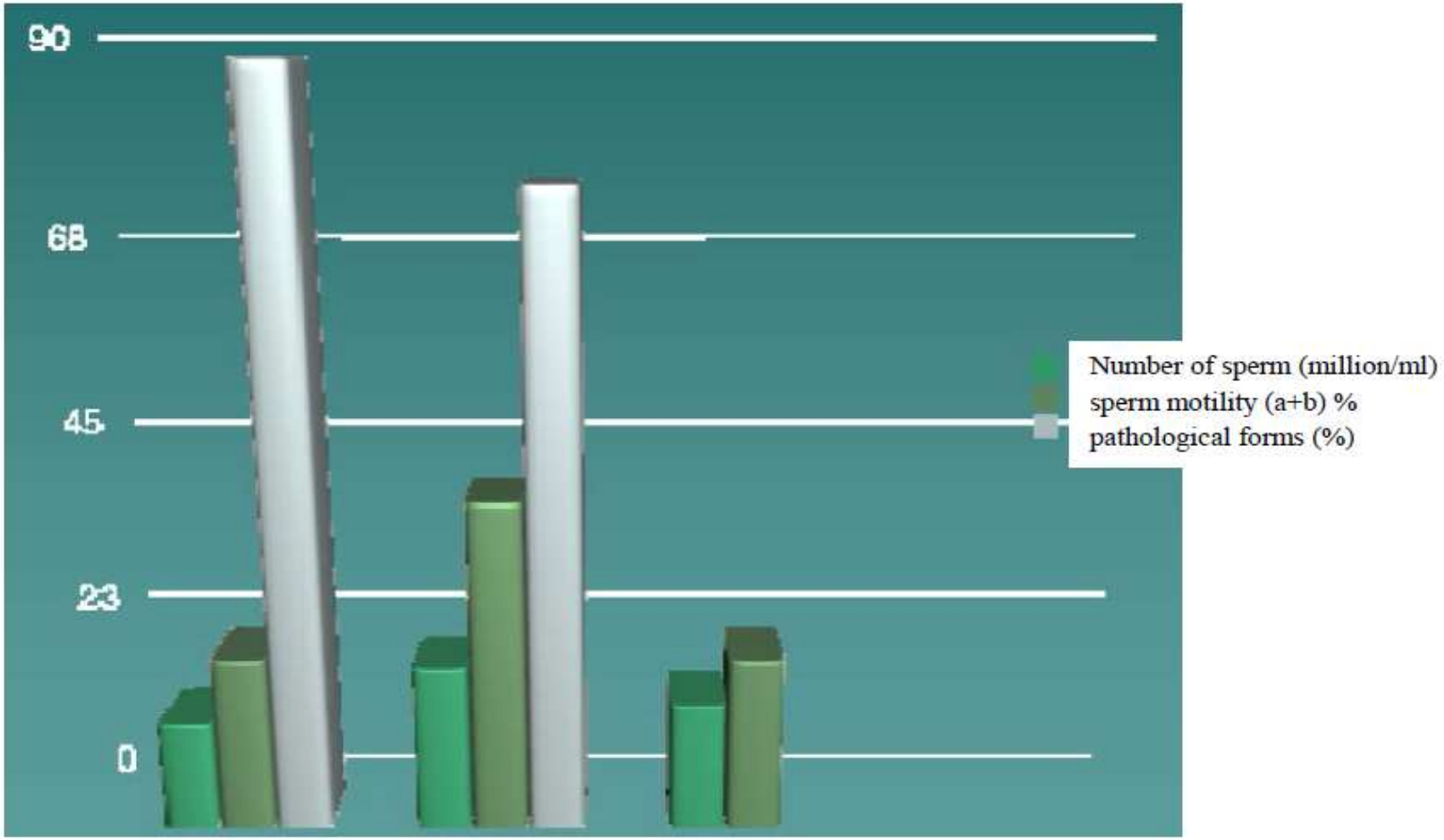
Distribution of testosterone (nmol/l) before treatment



Distribution of testosterone (nmol/l) after treatment



The semen and total testosterone levels before and after treatment



Spermogram readings before treatment

Electrode pharmaphoresis in the treatment of chronic prostatitis

Patient category	Pharmaphoresis	Control
Chronic bacterial prostatitis (II)	10	12
Chronic abacterial prostatitis (IIIA)	10	12

Influence of electrode pharmaphoresis on symptoms of chronic prostatitis

Patient groups	Indicators by the OAS-CP scale (average indicators)									
	Pain and paresthesias		**Dysuria**		**Quality of life**		**SI-CP**		**CI-CP**	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Pharmaphoresis (n20)	11	2	12	4	24	6	9	2	33	8
Control (n24)	10	5	12	8	23	13	8	4	31	17

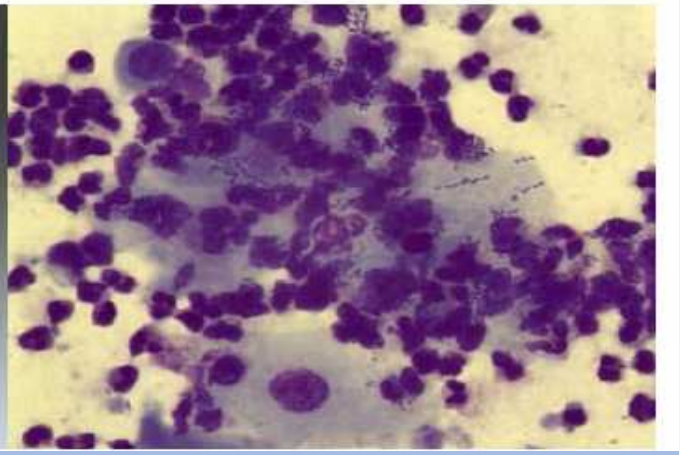
Overall severity of symptoms and quality of life in the study group decreased by 25 points, and in control – by 14 points, i.e., improvement was respectively 76% and 55%.

Influence of electrode pharmaphoresis on content of leukocytes in the prostate secretion

Patient group	Leukocytes in the prostate secretion million/ml	
	Before treatment	After treatment
Electrode pharmaphoresis	1.7 ± 0.5	0.8 ± 0.7
Control group	1.6 ± 0.6	1.2 ± 0.5

A clear regression of inflammatory proliferative changes in the prostate gland.





Results of the dopplerographic test

Studied indicators	Electrode pharmaphoresis			Control group		
	Before treatment	After treatment	After 6 months	After treatment	Before treatment	After 6 months
Vascular density (vessel to cm^2)	0.95 ± 0.04	1.50 ± 0.03	1.43 ± 0.04	0.87 ± 0.04	0.88 ± 0.03	0.87 ± 0.03
Maximum systolic velocity (cm/s)	9.04 ± 0.41	10.55 ± 0.41	9.92 ± 0.43	8.86 ± 0.53	8.79 ± 0.47	8.82 ± 0.56
The average linear velocity (cm/s)	5.37 ± 0.43	7.34 ± 0.46	7.08 ± 0.30	5.81 ± 0.51	5.89 ± 0.39	5.74 ± 0.53

Electrode pharmaphoresis contributes to the enrichment of a vascular pattern, an increase in the blood flow rate in the vessels of the prostate.

Efficiency of the electrode pharmaphoresis in patients with CP

Patient group	Results of treatment				
	General efficiency	Excellent	Good	Satisfactory	Without effect
Electrode pharmaphoresis (n 22)	18 (81.8%)	7 (31.8%)	10 (45%)	3 (13.6%)	2 (9%)
Control (n 24)	17 (70.8%)	2 (8.3)	9 (37.5%)	10 (41%)	3 (12.5%)

Results of treatment of patients with Peyronie's disease

terms	size of the plaque	amount
Before treatment	< 0.5 cm	5
	0.5 – 1.0 cm	3
	> 1.0 cm	3
3 months after treatment	< 0.5 cm	3
	0.5 – 1.0 cm	2
	> 1.0 cm	1
6 months after treatment	< 0.5 cm	–
	0.5 – 1.0 cm	1
	> 1.0 cm	–