

Electroionotherapy in acute arthrorheumatic pain

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Abstract. – The authors evaluated the efficacy of an electronic treatment for pain, using an ion flow generator, BE-101 model by Bio-Ejt, on 19 patients suffering from acute pain of an arthrorheumatic nature. Each patient was treated for two weeks every other day (6 sittings), each sitting lasting 20 minutes at an intensity of about 30 microAmper for both transducers. The results demonstrated that this technique is very effective in curing the pain.

Key Words:

Electroionotherapy, Ion flow generator, Arthrorheumatic pain.

Introduction

In physical treatment, in terms of using physical instruments for therapeutic purposes, today there are fundamentally 4 types; heat, electric current, vibrations and magnetic fields.

Each impulse of energy that reaches an organism activates a response (modulated) as there is a close qualitative-quantitative relationship between energy impulse and defence response, which tends to re-establish the basic biological condition¹.

The electronic ion generator is a device capable of producing an electrical field of an intensity that induces ionization of the air in a limited area. In association with the ionization there is a discharge current between the high voltage electrode and the part of the body being treated, accompanied by a magnetic field induced in the surrounding area. The passage of an electric current through a saline solution causes electrolysis, a reaction that consists in the distribution of ions in two

poles and the formation of new compounds. The human organism can be considered to be like an electrolytic solution as all its tissues contain saline solution. If a metal rod is electrified there is a movement of electrons which will have the maximum density at the tips or at edges. This density or electrostatic voltage will tend to leave the conductor and, when a sufficient intensity of current is reached at the tips, it causes a movement of ions that can be felt by man as an electric breeze.

The ionizing action has the following effects on tissue:

- Increases cellular selective permeability, followed by the physiological difference in membrane potential being re-established. This biophysical action would bring about the therapeutical efficacy for edema, inflammation and pain, as edemas are caused by entry of sodium and water into the cell, through the depolarized cellular membrane and consequently a release of lysosomal enzymes which cause inflammation and ultimately also pain.
- Ionization of the protoplasmatic molecules that constitute the collagen tissue that itself possesses opposite polarity at its two ends. This action would give rise to re-organization of the proteic structure and the reconstruction of normal intermolecular links.
- Increased permeability to Ca^{++} , resulting in activation of numerous calcium dependent enzymes, without tissue temperature increasing significantly.
- Stimulation of the neurotransmitter system of the nervous system.

On the basis of these effects this methodology could be indicated for a wide range of pathologies in the rheumatic-physiotherapeutic field: epicondylitis, contusions and muscle tears, tendinous synovitis, facial neuralgia, myofibrositis, cervicobrachialgia, post-traumatic edema, amputation stumps, coccyalgia, atonic ulcers²⁻³.

Purpose of the research

We assessed the efficacy of electroionotherapy in the rheumatic diseases.

Through a short cycle of electro-ionic sittings we studied the effect on acute pain of arthrorheumatic nature.

Moreover we studied the variation of the daily drug uptake and the functionality of sites interested .

Materials and Methods

19 patients, 12 women and 7 men aged between 32 and 75 (mean \pm 1 DS = 58 ± 12.8 years) over a period of two weeks underwent 6 sittings of ionic electroionotherapy every other day, using a BIO-EJT device, BE101 model. Each sitting lasted 20 minutes and ion flow intensity was equal to 30 microAmps for each transducers.

The patients admitted to the trial satisfied the following inclusion criteria:

- age,
- good general health,
- informed consent,
- no pace-maker or other metal prosthesis.

Each patient was assessed for pain intensity and functional deficiency through visual-analogical scores at the start and end of treatment. Moreover, the consumption of analgesics in the week prior to treatment and during the treatment cycle was evaluated. The visual-analogical scale for pain and functional deficit assessment was 0 to 5 and corresponded to: 0 = no pain, 1 = slight pain, 2 = modest pain, 3 = medium pain, 4 = intense pain, 5 = very intense pain; for assessment of functional deficit: 0 = no deficit, 1 = slight deficit, 2 = modest deficit, 3 = medium deficit, 4 = considerable deficit, 5 = total deficit.

Results (see Table I and Table II)

We treated the following arthrorheumatic pathologies: cervical arthritis in the algetic stage with functional impotence (8 cases), relapsing scapulohumeral peri-arthritis, scapulohumeral arthritis in the algetic stage (3 cases), torn muscle (one case), bursitis (one case), lumbar spondylarthritis (one case), lumbar discopathy (one case).

Statistical comparison of pre-treatment data and post-treatment data, using Student's "t" test for paired data, revealed a highly statistical significance both in pain relief ($t = 3.635$, $p < 0.0001$) and in functional recovery ($t = 2.437$, $p < 0.02$).

As concerns analgesic intake 5 patients out of 19 had taken pain killing drugs in the week prior to treatment (three were suffering from scapulohomeral peri-arthritis and two from cervical arthritis). At the end of treatment two patients had taken analgesic drugs during the treatment cycle; one of the previously mentioned 5 with cervical arthritis and another suffering from relapsing scapulohomeral arthritis who had not taken analgesic drugs before the ion electrotherapy began.

Discussion

The results show that the action of ion electrotherapy on acute pain is highly effective, as statistical analysis of the assessment scores and the reduced intake of analgesic drugs reveal. It is worth noting that analgesic intake before the treatment cycle was not particularly high even if patients were suffering from pathologies with a painful sympto-

Table I. Pathologies treated.

• Cervical arthritis in the algetic sage:	8 cases
• Scapulohomeral perarthritis:	4 cases
• Scapulohomeral arthritis:	3 cases
• Torn muscle:	1 case
• Bursitis:	1 case
• Lumbar spondylarthritis:	1 case
• Lumbar discopathy:	1 case

Table II. Panel of parameters measured.

	Age	Sex	Pathology	N° Appl	Pain score Star	Pain score End	Funct. score Star	Funct. score End	Analg intake Star	Analg intake End
G.A.	52	F	T.M.	7	5	3	0	0	N	N
L.A.	71	F	S.H.P.	6	2	0	2	0	N	N
M.F.	62	F	S.H.Arth	6	5	5	3	3	N	S
C.C.	36	M	C.A.	4	4	2	0	0	N	N
F.A.	50	M	C.A.	6	3	1	2	0	N	N
L.A.	71	F	Bursitis	6	3	1	2	0	N	N
P.F.	69	F	S.H.Arth	6	4	2	3	3	N	N
D.G.	62	F	L.Arthr.	6	5	3	3	1	N	N
D.G.	62	F	C.A.	6	3	1	3	1	N	N
P.G.	74	F	L.Disc.	6	5	1	3	1	S	N
M.F.	68	M	S.H.P.	6	3	3	3	3	N	N
G.V.	63	M	S.H.P.	6	4	0	2	1	S	N
R.Z.	32	M	C.A.	5	2	0	2	2	S	N
M.D.	51	M	S.H.Arth	6	3	3	2	2	N	N
B.M.	56	F	C.A.	6	3	5	3	3	S	S
B.R.	53	F	C.A.	4	3	3	3	3	N	N
F.G.	41	F	C.A.	6	3	0	2	0	N	N
F.M.	59	F	C.A.	6	3	3	3	3	N	N
S.A.	75	M	S.H.P.	6	3	0	2	0	S	N

Pain score: 0 = None; 1 = Slight; 2 = modest; 3 = Medium; 4 = Intense; 5 = Very intense.

Functional score: 0 = No deficit; 1 = Sligh deficit; 2 = Modest deficit; 3= Medium deficit; 4 = Considerable deficit; 5 = Total deficit;

Pathology: S.H.P. = Scapulohomeral periarthritis; C.A. = Cervical arthritis; S.H.Arthr. = Scapulohomeral arthritis; L. Disc. = Lumbar discopathy; L. Arthr. = Lumbar arthrosis; T.M. = Turn muscle.

matology; only 1 in 4. In our opinion this could be explained by the chronic nature of the pathologies involved, with phases of re-exacerbation and therefore the patients were, in a sense, used to “their pain” and limited analgesic intake to a minimum.

As concerns the action of functional recovery, there was an improvement, though less notable, which contributed to the state of well-being of the patient.

References

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