Clinical Observation of O_2-O_3 Treating Common Kinetic System Soft Tissue Injury Pain (141 cases)

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SUMMARY - Through observation of O_2-O_3 local infiltration treatment of eight common kinetic system soft tissue injury pain, we evaluated the short-term, mid-term and long-term efficacy of treatment in the experience of our therapeutic group. We adopt the national JZ-100 Ozone Treatment Instrument and medical-use pure oxygen as the material to prepare mixed gas of concentration 35-40 mg/LO_2-O_3, drawn out by 5ml injection syringes (single-use). According to pathological anatomy stigmas of different diseases, we adopt different infiltration injection methods respectively. Four sessions constitute one course with three day intervals. According to our follow-up two months after treatment, the efficacy excellence rate for eight diseases is about 85%; six months after treatment, the efficacy excellence rate is about 70%. Accurate pain site and dissection stratification infiltration can achieve positive efficacy, which is applicable for many times without the side effects of hormonal drugs.

Introduction

Kinetic system soft tissue injury pain involves two out of five patients in the Department of Orthopaedics.

Since 2002, our department has begun to adopt local infiltration by injecting O_2-O_3 to treat kinetic system soft tissue injury pain introduced by the Italy Ozone Treatment Study, usually used to treat eight common diseases with obvious efficacy out the total number of 141 cases reported as follows:

Tabella 1 **Patient details**

Diseases	*Female*	*Male*	*Total*
Tennis elbow	16	10	26
Periarthritis of shoulder	7	5	12
Painful heel	5	2	7
Osteoarthritis	18	12	30
Third lumbar vertebra transverse colligation	9	6	15
Fuli site strain under Diji muscle	16	6	22
Spine and supraspinal lig strain	8	5	13
Shoulder and back muscle			
Fasciitis and strain	9	7	16
			141

Most patients finished their treatment in the outpatient clinic. The oldest was 81 years and the youngest 22. The longest course of treatment was eight years and the shortest course one week.

Treatment Method

We adopt the national JZ-100 Ozone Treatment Instrument and medical pure oxygen to produce O_2-O_3, after 10 seconds, at a stable concentration of 34-40 mg/l. At the apophysis pain site the injection dosage is usually 3-5 ml. Tao to three pain sites are chosen at each lesion location. Peri-arthron and inner-cavity, the dosage is controlled 5-20 ml. Four sessions constitute one course with three day intervals. Tennis elbow, painful heel, third lumbar vertebra transverse colligation, and Fuli site strain under Diji muscle usually require one local injection with two layers infiltration of O_2-O_3 into the subperiosteum and outer-periosteum respectively. Periarthritis of shoulder and osteoarthritis usually require infiltrations into three anatomical sites at apophysis, inner synovium and articular cavità. Spinal and supraspinal ligament strain and shoulder and back muscle fasciitis and strain reqire sector infiltration into the painful area. Relief of symptoms is achieved in most patients after one course.

Observations and Results

All patients are observed for two to 26 months and the efficacy evaluation is divided as follows: Excellent - symptoms completely disappear with recovery of normal work and activities; Good - symptoms are obviously improved, free movement but some discomfort; General - symptoms have certainly improved but there is some limitation of work and motions; Bad - no symptoms improvement. Within two months, the excellency rate is about 85%; after six months, the excellency rate is about 70% indicatine that short-term efficacy is obviously better than long-term efficacy.

Discussion: Action Mechanism?

At present, national and international literature postulates that the main action mechanism [1,2,3,4] (1) directly affects the inflammatory pain-inducing factor of tissue and peripheral nerve lesion, such as 5-serotonin, bradykinin, lipid substances, hydrogen ion, etc. to have the effect of disintegration, neutralization and destruction to diminish pain; (2) stimulate local tissue to produce a relaxotherapy effect like acupuncture, which induces endogenetic analgesia substance to relieve pain; (3) the metabolism of O_2-O_3 directly improves local hypoxia status at nerve endings; (4) during the O_2-O_3 infiltration injection process, it could help accretion and contracture of lesion tissue be relieved.

Indications and Contraindications

Indications: (1) Classic kinetic system soft tissue injury history, symptoms and physical signs; (2) exclude other diseases after screening examination and relative assistant examination; (3) definite palpation at lesion site.

Tabella 2 **Follow-up after 2 months**

Diseases (Cases)	Results				Excellency rate (%)
	Excellent	Good	General	Bad	
Tennis elbow	9	13	4	/	84.6%
Periarthritis of shoulder	4	6	2	/	83.3%
Painful heel	2	3	1	1	71.4%
Osteoarthritis	15	11	2	2	86.7%
Third lumbar vertebra transverse colligation	7	7	1	/	93.3%
Fuli site strain under Diji muscle	9	10	2	1	86.4%
Spinal and supraspinal ligament strain	5	6	1	1	84.6%
Shoulder and back muscle fasciitis and strain	6	8	1	1	87.5%

Tabella 3 **Follow-up after 6 months**

Diseases (Cases)	Results				Excellency rate (%)
	Excellent	Good	General	Bad	
Tennis elbow	10	11	4	1	80.8%
Periarthritis of shoulder	2	7	2	1	75.0%
Painful heel	1	3	1	2	57.1%
Osteoarthritis	11	11	5	3	73,3%
Third lumbar vertebra transverse colligation	5	7	2	1	80,0%
Fuli site strain under Diji muscle	6	10	5	1	72.7%
Spinal and supraspinal ligament strain	4	5	2	2	69.2%
Shoulder and back muscle fasciitis and strain	6	6	3	1	75.0%

Contraindications: (1) other systemic pain; (2) unclear and diffuse pain location; (3) patients with hemorrhagic tendency; (4) severe *hyperthyroid* patients and (5) favism patients.

Injection Maneuver and Efficacy

The injection itself is easy, but the treatment requires accuracy, delamination and subarea to infiltrate the O_2-O_3 gas mixture to the lesion site to achieve good efficacy. We find the following aspects are keys of efficacy: (1) using disinfected fingers matching the injection site to define the anatomy locus. Because of human body's soft tissue easy deformation and mobility, it is not easy to master the accurate location. (2) According to the painful area anatomy locus, delamination, subarea and surrounding infiltration would achieve good efficacy. (3) Not using anesthetic, during the infiltration injection process, adjust injection dosage and range appropriately. (4) Lie down for 15 minutes after injection. Reduce movements during treatment and rest as much as possible. (5) Avoid rapid and strong injection to stop O_2-O_3 diffusing away from lesion area and thereby affecting treatment efficacy.

Complications and Prevention

Since the first application of ozone 160 years ago, there are no reports of disability or deaths caused by its pharmacological effects. But at the beginning of the last century, there were reports on the direct injection into blood vessels, especially veins, causing gas block induced death. This method has now been prohibited. Therefore, during the infiltration injection process, preventing direct blood vessel injection is the key point of this technique's application.

O_2-O_3 infiltration treatment for kinetic system soft tissue pain is easy and convenient. Because the metabolite is O_2, there is no leftover gas remaining in tissue, which could be used repeatedly. The treatment lacks the side effects of hormone drugs and increases treatment options for some special patients such as those with hypertension, diabetes mellitus, ulcer, osteoporosis or femoral head necrosis.

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