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The efficacy of intraarticular PRP, ozone and PRP + ozone injections in patients with osteoarthritis [abstract]

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ABSTRACT

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Background. Osteoarthritis (OA) is the most common form of arthritis and some joints are predisposed more than others. The prevalence of OA increases with age and it represents the major problem for functional impairment in older patients.

Purpose. This study was performed to determine efficiency of ozone + PRP (platelet rich plasma) injections on pain in patients with knee osteoarthritis.

Material and Methods. 102 patients with the diagnosis of OA according to the criteria of the American College of Rheumatology were enrolled in this study. Patients were randomized into three equal groups (34 patients each group).

Patients in the first group were treated with intra-articular injections of ozone 2 times/week, with 10 µg/ml ozone, 5 mL in volume for a total of 12 times .

Patients in the second group were treated with intra-articular injections of PRP + ozone (10 µg/mL ozone, 5 mL volume) once a week for a total of 3 times.

Patients in the third group were treated only with PRP injections once a week for a total of 3 times.

The pain levels of patients were measured with visual analog scale (VAS). We chose the patients with VAS score 5 and above.

The improvement strength has been evaluated according to Clinical Global image scale.

Keywords: Ozone knee injection; PRP knee injection; Osteoarthritis

PURPOSE

Osteoarthritis (OA) is a degenerative disease associated with the deterioration of the processes of production and destruction of cartilage and synovial tissues caused by various traumatic, biomechanical, inflammatory or genetic factors. This study aims to evaluate the severity of disease globally by intra-articular injection of ozone, ozone + PRP and PRP alone in patients with Knee OA.

Even though it can be seen in various joints, particularly knee and hip, when the spine is affected, the results can be severe.

Knee OA is often bilateral, more frequent in women and symptomatic knee OA prevalence in our country (Turkey) is reported to be 14.8%.

When the results from various studies were analyzed, it was found that among causes of disability; OA is in 7th row among women, 12th row among men and 5th row among the elderly population. In the United States (USA), the percentage of symptomatic OA over the age of 30 years and older people is about 6% in hips and 3% in knees.

There are several alternative treatment options for pain relief, including hot or cold treatments, oral or topical medications, injections, physical medicine and rehabilitation treatments other than surgical approaches.

In this study, we investigated how single and combined treatment of intra-articular ozone, PRP and ozone + PRP treatments, which are alternative treatment options in knee OA without surgical treatment in affect patients.

Ozone can be used in inflammatory and degenerative diseases related to the musculoskeletal system, showing anti-inflammatory and anti-oxidative effects. Clinical studies evaluating the effects of ozone on the musculoskeletal system are even more increasing.

Platelet rich plasma (PRP) is a plasma component that is obtained by centrifugation of whole blood and contains platelets at a higher concentration than whole blood. The presence of numerous growth factors in its content has led to the use of PRP injections in the treatment of various musculoskeletal disorders. PRP is also a known method of tissue healing. It has been investigated whether the combined use of ozone + PRP increases the efficacy.

MATERIAL AND METHODS

A total of 102 patients which attended to our clinics with knee OA were retrospectively included into the study of injections of intra-articular ozone, PRP and PRP +o zone.

Patients were evaluated with VAS before the application and patients whose VAS value was above 5 were taken into the study, without age and gender differentiation.

Patients were evaluated with Clinical Global Impression Scale before the first application and 1 week after the last application.

Patients with inflammatory, endocrine and metabolic disturbances, and patients who had meniscectomy within 10 years, extra articular surgery within 1 year, arthrocentesis in last 6 months or any drug given intra-articularly were not included in the study. Knee films and MRI views were evaluated by Radiologist and Physical Medicine and Rehabilitation specialist.

102 patients were divided into 3 equal groups (each group 34 patients).

First group only ozone (12 sessions 2 times a week with 10 µg/ml ozone, 5 cc volume ozone), We used siliconized ozone resistant injectors and bacterial filters; with a lateral approach to the knee we gave 5 ml of ozone into the knee joint .

Second group only PRP injections (once a week) 3 times,

Electromag Centrifuge 415P has been used for preparing the PRP.

Process: 10 cc of blood from the patient is added to the tube with citrate in the Easy PRP kit, and the first centrifugation is performed. 1st Centrifuge takes for 5 minutes at speed of 1200 rcf. After centrifugation, the erythrocytes were removed. The remaining material centrifuged again. The 2nd centrifuge takes 10 minutes at 1200 rpm.

At the bottom of the tube there is a decomposition reaction with buffy coat (about 0.5 cc), PRP (2.5 cc) as a second level and PPP (poor platelet plasma 3 cc) as the third level. Buffy coat and PRP are withdrawn with adjustable injector and (PRP 2,5 ml) has been injected to the knee joint with a lateral approach.

Third group Ozone + PRP combination (weekly PRP + 10 µg/ml with 5 cc ozone combination) 3 times. We prepared the PRP as above and took the ozone gas from the ozone generator and with a lateral approach to the knee we first injected the PRP and after the ozone gas.

RESULTS

In a retrospective study, Evaluation of the Clinical Global impression scale in the intra-articular injection of all patients (102 patients in total); 36 males and 66 females of 102 patients were found to have an average age of 56.11.

The stress subscale of the 34 patients who had only ozone injections decreased from 5.17 to the healing scale of 2.91

In the 34 patients who received Ozone + PRP combination, the stress subscale decreased from 5,14 to the healing scale 1.52.

In the 34 patients who had only PRP, the subscale of stress subscale decreased from 4.9 to the healing scale 1.85.

When the mean recovery scores were evaluated, it was 2.26 in the ozone alone group, 3.62 in the ozone + PRP combination and 3.06 in the PRP patients only.

The recovery scores of the patients who received the ozone + PRP combination were significantly better than ozone or PRP injections alone.

No side effects were observed during and after the treatments.

DISCUSSION

OA is a degenerative joint disease that increases with age and causes pain and disability to significantly impair an individual's quality of life.

It is considered to be an organ disease that affects cartilage destruction and changes in the subchondral bone, and all the joints and tissues around the joint. Pathologically, destruction and loss of articular cartilage, subchondral sclerosis and osteophyte formation are often accompanied by synovial inflammation and destruction of other structures that support joint. The loss of pain and functioning impairs the patient to a wide variety of treatment seeking, but unfortunately there are no medical or physical methods that have proven scientifically and proven to be effective in humans to prevent joint cartilage degradation and therefore all treatment approaches are aimed at relieving symptomatic pain and minimizing functional deficits. The goal of treatment in knee OA should be to control pain, to preserve and correct joint functions, to provide functional independence and to improve quality of life. In order to achieve these goals, knee OA therapy should include non pharmacologic, pharmacologic and if necessary, surgical methods.

Treatment should be tailored to each patient. Non-steroidal anti-inflammatory (NSAID) drugs are thought to be the standard treatment for OA in many cases but many patients are not able to tolerate these drugs or are exposed to side effects, while only analgesics are adequate in some patients.

As we have seen in the study above; ozone or PRP injections alone can be used for the patients with knee OA but the results of Ozone + PRP injections in knee OA reduced the pain more than the ozone and PRP injections alone.

This might be because of the anti inflammatory effect of ozone has been supported by the release of the growth factors from the platelets in PRP.

Therefore we can add ozone + PRP injections to patients who has OA without hesitation in additional to the classical treatment .

For further studies we can use Major Autohemotherapy for regeneration in addition to the injections of ozone, PRP, Ozone + PRP.

CONCLUSION

The combination of ozone + PRP offers the best results compared with PRP or ozone alone.

We could not get any biopsy from the cartilage so we could not show the healing or changes of the cartilage according to the decrease of pain and the increase of quality of life.

For further studies we could include biopsy and the measurement of inflammatory and anti inflammatory markers from the cartilage tissue before and after treatment.

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