

**LIGNISUL MSM (Methylsulfonylmethane)**

**A DOUBLE BLIND STUDY OF ITS USE IN  
DEGENERATIVE ARTHRITIS**

(A Preliminary Correspondence)

By

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Methyl-Sulfonyl-Methane (M.S.M.) is an organic sulfur compound which is a metabolite of dimethyl-sulfoxide (D.M.S.O.). It is a white, odorless, slightly bitter tasting, crystalline substance, which contains 34 percent elemental sulfur. It is easily soluble in water. Its chemical formula is  $(\text{CH}_3)_2\text{SO}_2$ . It has been suggested by Lovelock and his associate's (1) that M.S.M. and its related compounds D.M.S.O. and D.M.S. (dimethyl-sulfide) provide 85 percent of the sulfur found in all living organisms.

The cycle of these naturally occurring sulfur compounds begins in the ocean where microscopic plankton release sulfur compounds called dimethyl sulfonium salts. These salts are transformed in the ocean into the very volatile compound D.M.S., which escapes from the water as a gas, that rises into the upper atmosphere. Exposed to ozone and high-energy ultraviolet light the D.M.S. is converted to D.M.S.O. and M.S.M. Both the D.M.S.O. and M.S.M. are very soluble in water and they return to the surface of the earth in rainwater. Plants then take up the two compounds into their root systems concentrating them up to one hundred fold. M.S.M. (sulfur) is incorporated into the plant structure. Through the process of plant metabolism the M.S.M., along with the other sulfur compounds it has spawned, are ultimately mineralized and transported back to the ocean and the sulfur cycle begins again.

M.S.M. is found naturally in the human body. It occurs in the blood and in other organs and has been detected in normal human urine (2). The level of M.S.M. in the circulatory system of an adult human male is about 0.2 parts per million (3). Normal human adults excrete from four to eleven milligrams M.S.M.

per day in their urine. Experiments using radiolabeled sulfur (S35) in M.S.M. have shown that after ingestion the sulfur in M.S.M. helps form the essential amino acids methionine and cysteine (4).

M.S.M. is rated as one of the least toxic substances in biology, similar in toxicity to water (5). The lethal dose (LD50) of M.S.M. for mice is over 20 grams per kilogram of body weight. Hundreds of patients have been treated at the Oregon Health Sciences University (6) with oral M.S.M. at levels above two grams daily for many years without serious toxicity.

Since sulfur is found to be needed for the formation of connective tissue, M.S.M. has been studied for its use in treating arthritis of various types (7). Sulfur concentration in arthritic cartilage has been shown to be about one-third the level compared to normal cartilage (8). In addition, the amino acid cystine has been noted to be diminished in arthritic patients.

Personal communication with Stanley Jacob, M.D., Gerlinger Professor, Department of Surgery, Oregon Health Sciences University, Portland, Oregon, substantiated his personal experiences using M.S.M. in the treatment of patients with degenerative (osteoarthritis) arthritis.

### **Study Design**

M.S.M. was provided in a crystalline form (**LIGNISUL<sub>MSM</sub><sup>TM</sup>**) which we encapsulated in a clear gelatin capsule providing 750 mgms of **LIGNISUL<sub>MSM</sub><sup>TM</sup>**

per capsule. The placebo substance, which was also placed in clear gelatin capsules, consisted of sugar (sucrose) to which a small amount of quinine sulfate was added to create a slightly bitter taste. This was done in case the capsule was opened and tasted, since M.S.M. also has a slightly bitter taste.

A total of sixteen patients were studied over a period of four months. Initially twelve patients were admitted to the study and subsequently (two months later) an additional four patients were added to the study group. The initial twelve patients were divided as follows. Eight were given the M.S.M., while four received the placebo. Later, the additional four patients were divided into two on M.S.M. and two on placebo. Totally, therefore, we had ten patients on M.S.M. and six patients on placebo.

### **Criteria for Selection**

Patients ranged from age 55 to age 78. All patients had x-ray evidence of degenerative joint disease (degenerative arthritis). All patients had pain in the involved area ranging from four weeks to six months. Most of the patients had tried non-steroidal anti-inflammatory drugs or aspirin type compounds. None had taken steroids either orally or by injection. All non-steroidal anti-inflammatory drugs or other anti-arthritic medications or alternative health remedies were stopped at least three days prior to their entering the study.

Patients were randomly chosen by lot and assigned to either the active (M.S.M.) group or the placebo group. The treating physician did not have

knowledge as to which patient received which agent until after the completion of the study. Records were kept by an independent evaluator until the study was terminated. Both the patients and the physicians were blinded.

Of the eight patients of **LIGNISUL<sub>MSM</sub><sup>TM</sup>**, two had osterarthritis in their hands, three had lumbar degenerative joint disease, two had degenerative arthritis in their knees, and one had arthritis in the shoulder.

Of the six patients who received the placebo, two had degenerative arthritis in the knees, two had lumbar degenerative joint disease, one had degenerative arthritis in the hip, and one has osteoarthritis in the neck.

### **Dosage**

Patients were instructed to take two capsules on an empty stomach in the A.M. after arising and one capsule before lunch. This constituted a 2250-milligram dose of **LIGNISUL<sub>MSM</sub><sup>TM</sup>** daily and zero dose of M.S.M. on the placebo.

### **Measurement**

Each patient was administered a visual analog scale (V.A.S.) which consisted of a 10-cm line anchored at one end by a label of “no pain” and at the other end a label of “pain as bad as could possibly be.” The scoring is accomplished by having the patient mark the line indicating pain intensity, and the line is then measured to the mark on a 1-100 scale (9).

## **Results**

The V.A.S. was completed by each patient at the four-week and at the six week visit. Records were measured by an independent evaluator.

At the four-week visit, the patients on the **LIGNISUL<sub>MSM</sub><sup>™</sup>** showed a 60 percent improvement on average, while at the six-week V.A.S. evaluation the patients showed an 82 percent improvement in pain on average.

Those on the placebo showed an improvement of 20 percent on average at four weeks and an 18 percent improvement on average at six weeks.

## **Abstract**

This preliminary simple study was performed to initially evaluate 16 patients suffering from degenerative arthritis as to the effect of using **LIGNISUL<sub>MSM</sub><sup>™</sup>** to control their pain. Eight patients, randomly chosen, were treated with 2250 mgms of M.S.M. per day. Six patients received placebo capsules. Results indicate a better than 80 percent control of pain within six weeks of beginning the study, while only two patients showed a minimal improvement (less than 20 percent) on the placebo. Although this was only a simple preliminary study, it appears that a more intensive investigation of M.S.M. is warranted. A larger group of arthritic patients and an additional measurement evaluation (such as range of motion, etc.) should be utilized in such a future

study. **LIGNISUL<sub>MSM</sub>**<sup>™</sup> may offer a significant new nutritional substance for the control of arthritic pain as a safe, non-toxic method.

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