

Flotation for the Management of Rheumatoid Arthritis

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INTRODUCTION

The overall goal of this presentation is to demonstrate the interdisciplinary approach of health professionals and how we are investigating the benefits of using a flotation tank in the treatment of patients with rheumatoid arthritis. Rheumatoid arthritis is one of a large group of diseases in which inflammatory changes and pain are the major features. The effects of these changes on patient mobility and function are so profound that they cause significant changes in the patient's ability to earn a living, as well as his/her social status.

Treatment of rheumatoid and osteoarthritis continues to present major problems to health care professionals. The physical therapy goals of treatment are:

- 1) to relieve pain
- 2) to maintain and restore muscle power
- 3) to maintain and restore joint range of motion and mobility
- 4) to prevent deformities
- 5) to maintain optimum function
- 6) to educate the patient concerning his/her disability.

In order to achieve these goals, therapeutic exercises are given together with a variety of physical agents. The specific needs of each patient dictate the variations of the treatment procedures.

Several authors report that pool therapy can be helpful in the treatment of rheumatoid arthritis. Tindall (1976) reported that patients with decreased joint range, muscle weakness, and muscle pain derive significant benefit from pool therapy. The pain may be reduced by warm water which helps in muscle relaxation. The buoyancy of the water also supports the body in part, thus decreasing strain on the joints. Functional ability may be improved since muscles can be better exercised through graduated activities.

Washburn (1981) stated that a hot bath at approximately 40 degrees centigrade may reduce pain and the duration of "morning stiffness".

Moll (1983) reported that active exercises in a warm pool are particularly beneficial in the treatment of stiff and painful joints in patients with osteoarthritis, capsulitis, ankylosing spondylitis, and generalized arthritides.

We at Stony Brook read of a pilot study of salt water flotation in the treatment of nine patients with rheumatoid and osteoarthritis that was conducted in Australia by Dr. Dale Thomas. Three patients were diagnosed as having rheumatoid arthritis and six had diagnoses of osteoarthritis. Visual analogue scores of pain, tenderness, pulse and blood pressure measurements were made before and after treatments. The results of that study suggested patients with rheumatoid arthritis may benefit from the use of salt water flotation. This report stimulated our interest. Professor Craig Lehmann of the Department of Medical Technology had already completed some studies which showed flotation causing an immediate reduction in blood pressure. It was hypothesized that through flotation, patients with arthritis would be able to function better because of blood pressure and stress reduction. It was also our belief that the general physical therapy management of the rheumatoid arthritic patient could be greatly enhanced through the use of flotation.

Our preliminary findings at Stony Brook, using ten subjects, supported the findings of the Australian group. We found flotation offered significant benefits to the majority of those patients.

Some short term effects of flotation are:

- 1) blood pressure reduction
- 2) heart rate reduction
- 3) pain relief

It was hypothesized that long term effects would be:

- 1) stress reduction
- 2) pain reduction
- 3) improved functional ability

Initially, a pain questionnaire was used. This gave us subjective data concerning the patient's perception of his/her pain and functional ability. We used excerpts from the McGill Pain questionnaire. The questionnaire has three major classes of descriptive words: sensory, affective and evaluative, that patients use to describe subjective pain experiences. The questionnaire was also designed to provide quantitative measures of clinical pain that could be treated by statistical means. Types of data obtained

from the questionnaire included:

- 1) Pain rating index based on the rank values of the words. In this system, the word implying the least pain is given a value of 1, the next word a value of 2, and so forth. The values of the words chosen are then added up to obtain a score.
- 2) The Present Pain Intensity scale (PPI), the number-word combination chosen as representative of the overall intensity of the pain at the time of administering the questionnaire. The questionnaire is used before, as well as at the completion, of all treatments. The differences can then be expressed numerically.

As mentioned, ten subjects participated in the initial pilot study. All of these patients had a diagnosis of rheumatoid arthritis. Of the ten, six showed significant reduction of pain, with resultant increased ability to move about as determined by the pre-float and post-float pain questionnaire. The four subjects who showed no improvement did not follow through with appointments as scheduled; hence, had to be discontinued as participants in the study.

<u>Patient</u>	<u>Pre-float Pain Score</u>	<u>Post-Float</u>	<u>PPI Δ</u>
CS	0	0	-2
JM	20	7	same
MH	26	5	-3
RE	22	11	same
LA	41	33	same
MS	17	0	-2

As a result of these very positive findings, the research team decided to open the study to patients with "chronic pain syndrome" which included patients with total hip replacements, herniated discs, cracked vertebrae, and other debilitating problems. Our success with these patients, without other psychological intervention, was not nearly as great. It became obvious to us that many of these patients, with histories of pain of ten to fifteen years duration, needed psychological counseling, in addition to floating. As a result of a small paragraph in a local newspaper, we have been swamped with phone requests for treatment. We are now attempting to formulate a schedule to handle the more than 100 requests for treatment,

with calls coming in every day.

A review of the literature reveals that flotation or bathing in mineral springs called "spa therapy" has been known to exist since the ninth century. The earliest spas were located in Turnbridge, Wells, Scarborough, Epsom (where the water is undoubtedly saturated with $MgSO_2$), and several other cities in Wales and Scotland. The United States also has several springs located around the country.

The value of the treatment at each spa in Europe and America seems to be dependent upon the chemical content of the water. Some waters are rich in iron, some contain soluble chlorides, magnesium sulfate, calcium and sodium. The White Sulphur Springs located in West Virginia has an abundance of hydrogen sulphate.

Since the very beginning of the use of flotation and "Spa Therapy", no objective data have existed that would enable researchers to specifically quantify the reasons why so many arthritic patients report improvement in function, with reduction of pain following "float therapy."

We at the State University of New York at Stony Brook are attempting to do this. Two separate studies are being conducted. The first one involves patients with "pure" diagnoses of rheumatoid arthritis. The evaluative mechanism has become more sophisticated. In addition to the pre/post questionnaire, we now have the participation of a physician, Paul Tchou, who provides the medical direction for the drawing of blood which is done at three intervals: 1) prior to the first float, 2) at midway point during treatment, and 3) at completion of treatment. The purpose of this is to conduct a biochemical profile on each patient. If the patient reports improvement in functional ability or pain reduction after floating, we are interested in knowing why. In addition to investigating rheumatoid factors, we are hopeful of finding ways to measure the production of endorphins and enkephalins produced by the nervous system. Endorphins are defined as "one of a family of opioid-like polypeptides originally isolated from the brain but now found in many parts of the body".

Enkephalins are pentapeptides found in many parts of the brain which bind to specific receptor sites, some of which may be pain-related opiate receptors.

REFERENCES

- Moll, J. Management of Rheumatoid Disorders New York, NY: Raven Press, 1983.
- Tindall, A. Exercise in Water Duffield, M.H. (Ed), Baltimore, MD: Williams & Wilkins, 1976.
- Washburn, K. Physical Medicine and Rehabilitation 2nd Ed., Medical Examination Publ. Co., Inc. 1981.