

Reflexology Research

The following Research Study was presented to the Reflexology Association of America (RAA) in its entirety by Dr. Shweta Choudhary, Dept. of Biophysics, All India Institute of Medical Science (AIIMS), New Delhi, India. The following abridged version is reprinted from the RAA magazine *Reflexology Across America*, Spring 2006 Edition. Dr Shweta recently completed another research study on “The Efficacy of Reflexology for Prevention of Post-Operative Nausea and Vomiting.” She is also interested in researching Reflexology for patients with cancer and spinal problems. Dr. Shweta believes that 75% of diseases are due to stress and tension in the body, which create an imbalance of biochemical and endocrine functions. Due to Dr. Shweta’s successful work in Reflexology research, more physicians and professors at AIIMS are taking greater interest in Reflexology. Dr. Shweta’s biography follows this article.

We wish to thank Dr. Shweta for her interest in Reflexology to prove its efficacy and sharing her research results with RAA.

Theresa Carr, RAA Research Chair

Reflexology Reduces the Requirement and Quantity of Pain Killers after General Surgery

Shweta Choudhary PhD, (Dept. of Biophysics), Dr. Guresh Kumar, Dr. Kulwant Singh (Dept. of Biostatistics) All India Institute of Medical Science (AIIMS), New Delhi, India

Purpose: To find the efficacy of Reflexology in patients with postoperative pain after general surgery.

Method: Sixty (60) adult patients of general surgery from The All India Institute of Medical Science over the period between 2002 – June, 2004. Patients were divided randomly into two groups.

Group I: Reflexology group (foot reflexology and required quantity of standard drugs.)

Group II: Control group (standard quantity of standard drugs.)

Standard drugs included: NSAID (Diclofenac) and Opioids (Pethidine and Fentanyl).

Pain score was measured by using a visual analog scale of 0 - 10.

In Group I, pain was measured at the time scale of 0, 2, 6, 24 hours, and additionally, 20 minutes prior to each hour. 20 minutes is the time interval before and after therapy. 0 hrs. is time which patient was shifted to recovery room. In Group II, pain score was measured at time intervals of 0, 2, 6, and 24 hours only.

Results: Group I showed a significant decrease in pain scores and the requirement and quantity of drugs as compared to Group II.

Conclusion: The effect of Foot Reflexology causes a significant reduction of requirement and quantity of painkillers and significant reduction of pain score in Group I in comparison with Group II in post-operative patients of general surgery.

Introduction: Reflexology is the act of applying pressure on certain areas of the hands and feet that correspond to particular organs and glands of the body using specific thumb, finger and hand techniques without the use of oils, lotion or creams. The physiological changes achieved with the application of pressure are based on the

neurological relationship that exists between the skin and the nervous system. Whereas, a therapeutic effect can be achieved by stimulation at a distance from the area where the pressure is applied. Reflexology believes that the body is reiterated, or mirrored on the feet and hands and works within a zonal system, as introduced by Dr. William Fitzgerald. According to the zone theory, the body is divided into ten equal longitudinal zones (five on the left side and five on the right side) running through the body from the top of the head to the tips of the toes. If there is congestion in any part of the body, the corresponding zone is affected. Using this theory, we apply direct pressure to any part of the affected zone to stimulate the entire zone. Dr. Riley supported the zone theory and his assistant, Eunice Ingham plotted the reflexes of all the body areas onto the feet, thus creating the foot map.

The study of Reflexology is based on anatomy and physiology of the human body. The principle of Reflexology is founded on the understanding of how the nerves work and what they mean to the human body

Reflexology is one of the most miraculous means of utilizing a natural healing method for maintaining the body in a post-operative condition. Reflexology is a non-pharmaceutical intervention. The body's vital life force circulates along pathways with an estimated 800 points on the body. It is not necessary to know all of these points since the hand as well as the feet contain "reflex buttons" which are connected to all organs and glands. When these reflex centers are stimulated, they instantly send a surge of new vigor to the part of the body they are connected to and with no side effects.

The use of Reflexology has increased in medical care. Recent reports include usage in birthing, OBGYN care, post-surgical care, ICU, and patient support. The International Institute of Reflexology clearly states that it does not make any medical claims.

Theory of Reflexology: There are over 7,200 nerve endings in each foot, which have an extensive interconnection with the central nervous system. These nerve endings are part of our sensory apparatus in which they sense pain and pressure, hot and cold, etc. Reflexology stimulates or fine-tunes this sensory apparatus and its neural pathways. Stress patterns are also manifested on the feet. There are many theories of Reflexology, some of which are explained here.

Applied Theory – the foot reflects the body's response to the stresses of gravity and movement.

Blood and nerve supply theory – When muscles become tense, they press on the arteries causing sluggishness in circulation. This results in toxins in the blood, which would normally be excreted. At these deposits, needle shaped crystals settle in the extremities of the hands and feet. It is believed that these deposits interrupt some nerve impulses and cause dysfunction in the blood circulation. Reflexology applies pressure to break down the crystals and release them through the excretory systems.

Pain: Post-operative pain is attributed to the cutting of pain fibers or irritation of pain nerve endings.

Methods used in prevention of post-operative pain:

Conventional Method – Painkillers such as NSAID (Diclofenac) and Opioids (Pethidine and Fentanyl.)

Non-conventional Method – Acupressure, Acupuncture and Reflexology.

Method: Sixty (60) adult patients were randomly divided into Group I (Reflexology group) and Group II (Control group).

Group I: Reflexology group (foot reflexology plus the required quantity of standard drugs.) N=32(12Males, 20 Females)

Group II: Control group (standard quantity of standard drugs.) N=28 (12Males, 16 females)

The standard pain killers used: NSAID (Diclofenac) and opioids (Pethidine and Fentanyl.)

Two types of measurements were used in this study:

Measurement of quantity and requirement of painkillers.

Measurement of pain score.

Pain score was done at four (4) different time intervals.

In Group I – Pain score was measured 0, 2, 6, 24 hours and 0 hrs.– 20 min., 2 hrs.-20 min., 6 hrs.-20 min. and 24 hrs.-20min.

In Group II – Pain score was measured at 0, 2, 6, 24 hours.

0 hours as defined as the time patient was moved to recovery room.

20 minutes is the time before and after Reflexology therapy.

It was noted that there was a decrease in the requirement and quantity of painkillers in the Reflexology Group I compared with the Control Group II.

Pain was monitored on a visual analog scale (VAS) of 0 to 10, with 0-5=Mild pain, 5=Moderate pain, and 5-10=Severe pain.

Group I received foot reflexology for 15-20 minutes sessions. Sessions began with reflexology relaxation techniques, and thumb (thumb walking and dig and back up) and finger (finger walking and finger rotary pressure) working techniques. Areas reflexed were specific to type of surgery performed and the related areas of pain.

Results:

Comparison of quantity of painkillers in Group I and Group II

Time Interval:	0 hrs.	2 hrs.	6 hrs.	24 hrs.
Group I	65.5%	19.5%*	75%	65.5%
Group II	100%	85%	100%	100%

P=.001 P=.001 P=.005 P=.002

*An absolutely significant decrease of requirement of drugs in Group I.

This study shows a decrease of the quantity of painkillers in Group 1 to less than 50% as compared to Group II. Statistical analysis was done by applying the Fischer exact test (Chi square test).

Comparison of pain score in Group I and Group II

Time Interval:	0 hrs.	2 hrs.	6 hrs.	24 hrs.
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Group I	5.25±1.646	4.906±1.201	3.813±.5748	2.28±.683*
Group II	6.393±1.397	4.43±8	4.43±8	3.143±.5

P=.007 P=.026 P=.009 P=.000

*An absolutely significant decrease of pain score in Group I as compared to Group II.
Statistical analysis was done by applying the “T” test.

Comparison of pain score in Reflexology Group I before and after Reflexology Therapy.

Time Interval:	0 hrs.	2 hrs.	6 hrs.	24 hrs.
Group I				
Before therapy	5.25±1.65	4.91±1.20	.81±1.57	2.28±0.68
After therapy	5.28±1.42*	3.91±1.20**	3.06±1.46	1.59±.084**

P=.927 P =.000 P=.000

*A non-significant decrease of pain score in Group I after Reflexology therapy.

**An absolutely significant decrease of pain after Reflexology therapy.

Discussion

Under most circumstances pain causes the greater amount of suffering, particularly after major surgeries. In some cases, nausea and vomiting may be distressing, particularly after minor surgery. It is considered that there are areas of the body that have only one or two histological types of receptors, and yet, they are sensitive to variety of different stimuli.

The specific area of central nervous system to which afferent nerve fiber pass determines the type of sensation. For example, if a pain nerve fiber is stimulated by heat, cold, touch, and pressure, the individual will experience only pain.

Gating Theory

Specific neural pathway for specific pain fibers (A delta nerve fibers) travel through the spinothalamic tract towards the central nervous system. When touch and pressure is applied on specific reflex point, it would activate slow conducting C fibers that take the same pathway thereby inhibit the path of A delta nerve fibers and block the pain.

According to this theory, pain signals pass through a number of traffic “gates” as they move from the area of injury upwards through the spinal cord to the brain. Like a road or highway, these nerves can handle only a limited number of nerve signals at one time. The pain signals travel slowly. We can generate C fibers through use of Reflexology by applying pressure on a specific reflex point.

Reflexology generates competing stimulus of C fibers and effectively blocks the slow pain signals from reading the brain, blocking the pain pathway. The gating theory says that pain impulse can be blocked in the spinal cord by inhibiting signals coming from touch nerve fibers due to this relief in pain.

Reflex Conditioning

Stimulus – Information is sent from the foot to the brain.

Evaluation – The brain analyzes the information.

Response – After brain response to the recent information by sending instruction to the entire body about how to adapt.

Transduction: It is a process by which one form of energy (the stimuli) is changed to another form of energy (electrochemical energy) of nerve impulse. The stimuli when applied to the receptor, brings about a change potential of the plasma membrane of the nerve ending. Since this process takes place in the receptor, it is referred to as the receptor potential. If the receptor potential is large enough, it generates an action potential. Impulse conduction is simply the movement of action potentials along a nerve cell.

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Dr. Shweta Choudhary

Dr. Shweta choudhary was born on 13th December 1977 in a district named Muzaffarnagar of Uttar Pradesh (India). Her father Mr. Suresh Pal Verma was an agriculture engineer, but his present life is devoted to spirituality. Her mother, Mrs. Mithilesh Verma was a teacher, but now she prefers to stay at home with her family and learn Reflexology.

Dr. Shweta completed her initial education from her native place in Uttar Pradesh (India). She went on to complete her graduation in Biology and Chemistry. Later, she pursued her Post graduation in physical chemistry specialization and also received an Honor in the same from Meerut University, Uttar Pradesh in 1998. Soon in the year 1999, she started teaching the students of graduation and post graduation in chemistry department in Meerut University.

In the following year she qualified the interview for Junior research fellow (JRF) in Dept. of Biophysics and started her study in reflexology. After that she succeeded in qualifying the PhD entrance examination of AIIMS, and got the PhD registration in 2001 in Dept. of Biophysics. She studied 'the efficacy of reflexology for prevention of post operative nausea vomiting and related pain'. Dr. Shweta worked in the general surgery Dept. with Dr. Anurag Shrivastva, Prof. of Surgery and learned the applications of Reflexology with him. She studied Reflexology under the guidance of Mr. I.P. Bahl, Founder President of All India Acupressure Reflexology. But as a famous saying goes 'there are no roses without thorns', such has been Dr. Shweta's journey. She had to face many difficulties in her research and overcome great obstacles. But with the support of her H.O.D. Dr. T.P. Singh and President of India, Dr. A.P.J. Abdul Kalam, she could complete her research work. Now she is interested in Physico-chemical study of reflexology, and is looking forward to study the efficacy of reflexology in cancer patients.